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**The development and maintenance of expert athletic performance:
Perceptions of Olympic and World champions, their parents and coaches**

Natalie Durand-Bush

A thesis submitted to the School of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Faculty of Education
University of Ottawa
Ottawa, Ontario

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DEDICATION

I dedicate this dissertation to my amazing husband D'Arcy
who always stood by me throughout this journey.
I love you from the bottom of my heart.

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ABSTRACT

The development of expertise has been a popular topic of investigation across several performance domains, including sport. An increasingly sophisticated knowledge base regarding both the nature of sport expertise and the factors that facilitate its development has begun to emerge, however, many questions remain to be answered. The purpose of this study was to examine the factors that contributed to the development and maintenance of performance of highly accomplished athletes. During the first phase of the study, 10 athletes having won at least two Olympic gold medals or two World Championship titles, or a combination of both, were interviewed using an in-depth, open-ended, and semi-structured approach (Patton, 1987). In order to complement and authenticate the data elicited from the athletes, their parents (n=9) and coaches (n = 4) were also interviewed. The data were analyzed both inductively and deductively using Côté, Salmela, Baria and Russell's (1993) procedures for organizing and interpreting unstructured qualitative data. Results revealed that the athletes progressed through four stages throughout their career: the Sampling, Specializing, Investment, and Maintenance Years. Several factors were perceived to be important across these stages and they pertained to the athletes' context, personal characteristics, training, and competition. Although there were differences in the athletes' perceptions, common findings were that parents and coaches were extremely valuable resources throughout their career. Furthermore, the athletes manifested certain attributes that contributed to their development, which included a love for sports, self-confidence, determination, perseverance, a strong work ethic, and natural talent. As the athletes moved to a higher level in their sport, training required more hours, intensity, and quality. Competition also

became more demanding but through their preparation, they developed strategies that enabled them to enjoy the process of performance and to cope with pressure and distractions. In the second phase of the study, 3 of the 10 athletes participated in a concept mapping activity (Huberman, 1989; Miles & Khattri, 1995), in which they created a holistic map that profiled the factors deemed important in their development, using the categories that emerged in the first phase of the study. Although their maps were structured in different ways, the athletes identified several common factors that concerned their context, personal characteristics, training, and competition. They also depicted similar relationships between these factors. Overall, the data collected from the concept mapping activity confirmed the analysis that was completed during the first phase of the study. They also corroborated the information the athletes provided during their interviews. This study is significant because it made several theoretical, methodological, and practical contributions regarding the development and maintenance of expert performance in sport. It demonstrated that although several factors contributed to the athletes' expertise in sport, various paths led them to become World and Olympic champions. Extensive information can be used to guide future studies and to enhance the experience of athletes, parents, and coaches. Researchers should continue investigating the factors affecting the development of expertise in sport, particularly at the maintenance years level, because empirical information is still lacking.

CHAPTER I

INTRODUCTION

Description of the Problem

Since the beginning of humanity, men and women have demonstrated their incredible will and capacity to surpass themselves, to realize seemingly unattainable goals, and to reach seemingly unreachable heights. But what characterizes or separates these people from the rest of the population? Why are they able to perform beyond our imagination? Part of the answer lies in the type, amount, and quality of work they do to reach their goals (B. S. Bloom, 1985; Csikszentmihalyi, Rathunde, & Whalen, 1993; Ericsson, 1996).

Outstanding individuals have long been labeled as “experts.” In the 1965 Webster’s Dictionary, an expert is defined as someone “experienced; taught by use of practice; skillful; dexterous; adroit; having a facility of operation or performance from practice. A skillful or practiced person” (p. 310). Of particular interest is that in this brief definition, the word “practice” appeared three times. In fact, it has been shown that work and practice are essential ingredients in the development of expertise (B. S. Bloom 1985; Ericsson, Krampe & Tesch-Römer, 1993; Salmela, 1996).

Although the Webster’s Dictionary definition of an expert has been provided, it is not the only one that exists. Defining expertise has plagued people’s minds for quite some time now. Philosophers, theorists, researchers and even general lay people, have all tried to come up with their own definition of expertise. Because the development of expertise is such a broad and complex phenomenon that encompasses what seems like limitless lists of intrinsic and extrinsic factors, we are still to this day struggling to define

expertise, identify metrics to measure it, and develop theories that describe the fascinating paths leading to it.

The study of human expertise has gained much popularity and significance among scholars in the areas of arts, music, sciences, medicine, literacy, and sports, yet several issues regarding its development remain ambiguous and unexplained. A review of the literature revealed that researchers having studied expertise throughout the years have come from different schools of thought, and therefore have used very different paradigms and protocols to conduct their research. This demonstrates that there is definitely more than one way to study expertise. However, due to the prevalence of inconsistencies in empirical findings, many authors have expressed their dissatisfaction with the current theoretical understanding of the expertise phenomenon (Lesgold, 1989; Patel & Groen, 1994; Sloboda, 1994). Some researchers have even suggested a shift in research orientations toward new paradigms or approaches that could generate more accountable theories for the development of expertise (Holyoak, 1994). This suggestion is enticing, however, it seems unlikely that the academic community will move solely in one direction in the future. There are too many paths researchers can take.

Some studies on expertise have been conducted in laboratory settings using think-aloud protocol analyses (Ericsson & Smith, 1994). Ericsson and Smith postulated that expertise can be best measured by a set of standardized laboratory tasks that can capture superior performance under controlled conditions. While this type of methodology has merit to study expertise in fields involving simple, repetitious, and predictable tasks, it certainly has severe limitations for examining sport expertise, which implicates the performance of complex physical and cognitive tasks. For example, it would be

extremely difficult to reproduce high-level training and competitive situations involving a team of water polo players in a laboratory environment. Ericsson and Smith did acknowledge that:

An important limitation concerns the difficulty of studying the development of superior performance in real-life expertise. To understand the many factors underlying why some individuals attain the highest levels of performance whereas others do not, we need to broaden our approach. (p.33)

Consequently, researchers raised the need to develop designs in which several factors could be investigated simultaneously rather than be examined in isolation in laboratory settings (K. T. Thomas & J. R. Thomas, 1994).

A review of the literature encompassing various types of studies on expert performance suggests that several factors play a significant role in its development. Common factors that were cited include the following in no particular order: training (Côté, Salmela, & Russell, 1995; Ericsson et al., 1993; Salmela, 1996; Starkes, Deakin, Allard, Hodges, & Hayes, 1996), teaching/ coaching (Côté & Hay, in press; Côté, Salmela, Trudel, Baria, & Russell, 1995; Dodd, 1994; Salmela, 1996; Sternberg & Horvath, 1995), parental support (B. S. Bloom, 1985; Côté, 1999; Csikszentmihalyi et al., 1993), enjoyment (B. S. Bloom 1985; Csikszentmihalyi et al., 1993; Scanlan, Stein, & Ravizza, 1989), recovery (Ericsson, 1996; Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987; Starkes et al., 1996), age (Ericsson, 1990; Krampe & Ericsson, 1996; Weinberg & Gould, 1995), mental skills and attributes (Botterill, 1990; Orlick, 1996; Orlick & Partington, 1988), and innate abilities (T. J. Bouchard, 1984; C. Bouchard & Malina, 1984).

These factors, further elaborated in the literature review, have received empirical support in varying degrees. Nonetheless, it was revealed in surveys of expertise research (e.g., Waldmann & Weinert, 1990) that none provide a universal characterization of expert performance. Holyoak (1994) concluded that “When we survey the overall field of expertise research, we find what is surely a disconcerting lack of constancy in the correlates of expertise” (p. 309).

In an article highlighting directions for future research on expertise in learning, performance, and instruction in sport and physical activity, Dale Housner and French (1994) stated that sport performance is a complex interaction of biological, psychological, and sociocultural factors that require further research in order to identify those that enhance the development of athletic expertise, as well as their relations at various stages of this process. They also raised the need to investigate the role of parental support and coaching, as it has not been extensively studied in relation to the acquisition of sport expertise. Furthermore, because research examining older athletes has received little attention, they stated that more work is needed to understand the maintenance of expertise across the life span.

Based on the aforementioned gaps and recommendations in the literature, it would appear to be important to further study the development of exceptional performance in sport. It would also be of interest to examine the real life experiences of athletes rather than have them perform isolated or irrelevant tasks in laboratory settings. The design of a qualitative study that would enable the simultaneous examination of various factors perceived to be linked to not only the development but also the maintenance of sport expertise is warranted. As Dale Housner and French (1994) highlighted, there is a need to

further investigate the maintenance of expertise, particularly in the domain of sport, because very little empirical attention has been focused on that level of performance. An emergent design using in-depth and open-ended interviews, for example, would provide an excellent means for athletes to share extensive information regarding the expertise phenomenon in sport. The use of alternative methods would also enable researchers to examine this topic from different perspectives. In any case, it would appear to be wise to utilize a combination of methods to triangulate the data provided by various sources (Huberman & Miles, 1994).

It would also be of interest to examine the perceptions of not only outstanding athletes but also those of their parents and coaches because some researchers have found that these individuals play a significant role in the acquisition of expert performance (Bloom, 1985; Salmela, 1996). Yet, as Dale Housner and French (1994) pointed out, their perspectives are sparse in the literature. The data collected from these sources could complement and authenticate the data provided by the athletes.

Significance of the Study

As can be seen in the previous paragraphs, there are certain gaps in the literature that need to be addressed. These gaps led to the development of the current study in which the perceptions of World and Olympic champions and those of their parents and coaches were examined in an attempt to uncover the factors that were linked to the development and maintenance of expert sport performance. This study is significant because it will contribute to the knowledge and the development of theories and models attempting to explain the achievement of expertise in sport. It will also increase our current understanding of the roles and responsibilities of parents and coaches in the

development of expert athletic performance. This investigation is also particularly meaningful because it will fill an important gap in terms of what athletes need to do to maintain their performance once they reach the pinnacle of their sport.

From a methodological standpoint, this study will provide interesting information regarding an innovative method that can be used to investigate the lives of experts. The method of concept mapping shows great promise for future research because it can be utilized in combination with other methods, such as interviews, and can serve to triangulate the data and verify analyses and interpretations.

The current study will also have practical implications for athletes, coaches, parents, sport administrators, and policy makers. The findings could potentially impact the lives of thousands of children, adolescents, and adults who commit themselves to mastering sports and physical activities for various reasons such as personal growth, satisfaction, vicarious experiences, wellness, and more external rewards like praise, recognition, scholarships, and competitiveness (Weinberg & Gould, 1995). Gaining a more thorough understanding of the development of expertise in sport will help coaches, sport administrators, and policy makers to develop appropriate strategies and programs to facilitate this process. This study will guide them in their quest to enhance the performance of average and near experts, and to increase the number of expert athletes in general. It will also help them to increase the quality of performance of individuals participating at other levels as well.

Athletes will also benefit from this study because they will gain information that will help them to enhance their development at various stages and to seek appropriate resources to maximize this process. In an era where much emphasis is placed on self-

directed learning, athletes must be aware and take charge of nurturing those factors contributing most to the development of consistent high-quality performance. The current study will make a significant contribution in that respect.

This paper is structured into five chapters. Chapter I served to introduce the research topic and important gaps, and also to highlight the potential theoretical, methodological, and practical contributions of this study. The next chapter, Chapter II, focuses on a review of the literature in which pertinent empirical information as well as existing theoretical and methodological gaps in the area of sport expertise are described in detail. These gaps motivated the current study and will be synthesized along with the purpose of the study at the end of this chapter. Chapter III outlines the research paradigm and design that guided the current study, as well as the methodology and procedures that were used to collect, analyze, and interpret the data. The results of the study are presented in Chapter IV and are subsequently discussed in light of the literature in Chapter V. Limitations and recommendations for future research are also included in this chapter. The conclusions are outlined in Chapter VI.

CHAPTER II

LITERATURE REVIEW

The purpose of this chapter is to provide an account of factors that have been shown in the literature to contribute to the achievement of outstanding abilities and to summarize the conceptual framework that guided the current study. This chapter also presents theoretical and methodological gaps that motivated this investigation. The following factors will be critically analyzed and discussed in no particular order of importance: training, teaching/coaching, parental support, enjoyment, recovery, age, mental skills and attributes, and innate abilities.

Training

The old slogan “Practice makes perfect,” is still popular today for a reason. No one would deny that practice is a necessary mediating factor to achieve expertise in any domain. But just how much training does one need to engage in to reach the top? Researchers like Ericsson and colleagues (1993) believe that practice is the most significant factor in the development of high-level performance. Adopting an extreme environmental position, they proposed a theory of expertise predominantly based on what they termed “deliberate practice.”

In their extensive review of the research on expert performance and their own studies with expert and amateur pianists and violinists, Ericsson et al. (1993) observed that even when individuals had access to similar training environments, large differences in their performance often still occurred. They also found that their experience in a domain was a weak predictor of their performance in that same domain. Rather than accepting these facts as evidence for innate differences in ability, they attempted to

identify training activities that were most closely related to improvements in performance. They found that improvements were generally manifested when performers engaged in well-defined tasks with appropriate difficulty levels, informative feedback, and opportunities for repetition and correction of errors. Ericsson et al. subsequently used the term deliberate practice to characterize these activities. More specifically, these authors used this term to refer to any highly structured, goal-directed activity exclusively aimed at improving performance. It is noteworthy that these activities are distinct from recreation and spontaneous play, competition, work, and other forms of experience in a domain. Because they are effortful, Ericsson et al. (1993) postulated that they generally are not inherently motivating nor enjoyable.

Ericsson and colleagues (1993) strongly advocated the nurture aspect of performance and proposed that expertise is the result of an extended process of physical adaptations and skill development involving interactions between individuals and their environment. At any stage of development, performance is significantly influenced by environmental factors that either facilitate or constrain the developmental process. Ultimately, the achievement of exceptional skills reflects the ongoing long-term adaptation to the demands and constraints of deliberate practice within a particular domain. This finding was substantiated by other studies that have demonstrated the importance of practice in acquiring high-level, domain-specific skills (B. S. Bloom, 1985; Hodges & Starkes, 1996; Simon & Chase, 1973).

According to Ericsson and Charness (1994), the number of hours of deliberate practice accumulated in a domain is a significant determinant of the level of expertise attained. In fact, their research with novices and experts suggests that the amount of

accumulated practice is monotonically related to the achieved level of expert performance. This implies that an individual's level of performance will be severely constrained if sufficient time is not invested into high-quality training.

Some researchers have found that experts invest more hours of practice per week compared to novices, and start engaging in deliberate practice at younger ages. However, the amount of daily deliberate practice does not appear to be constant throughout their career. When they start practicing in a domain, weekly amounts of practice are minimal but they are slowly increased to a maximal level in later stages of training (Ericsson, 1990, 1996; Krampe & Ericsson, 1996; Starkes et al., 1996).

According to Ericsson (1996), outstanding performers typically engage in at least 10 years or 10,000 hours of deliberate practice before reaching expert status. This 10-year rule has been found to hold in domains like chess (Simon & Chase, 1973), sport (Kalinowski, 1985; Monsaas, 1985; Starkes et al., 1996), mathematics (Gustin, 1985), and music (Sosniak, 1985). Ericsson (1996) indicated that experience, or the number of years spent in a chosen field, does not accurately reflect the level of expertise attained. The 10-year rule of preparation refers to 10 years or 10,000 hours of *deliberate practice*, and not simply 10 years of experience. Spending 10 years in a field is a necessary, but not sufficient condition to achieve expertise.

Ericsson and colleagues (1993) have put forth an interesting and influential framework to study the development of expertise. However, their claim that extended practice is both a necessary and sufficient condition to reach an expert level has led to some disagreement and controversy. In a recent article, Singer and Janelle (1999) stated the following regarding the 10-year rule:

A chief concern is the abundance of attention directed toward the amount of deliberate practice (i.e., “the 10-year rule”) as well as the general characteristics of deliberate practice, at the expense of focussing on the content and quality of practice sessions. It is intuitively obvious that practice over a long period of time during which arduous levels of concentration, effort, and determination are expended, will result in the development of expertise if practice is conducted in an effective manner on critical performance skills ... Given the emerging evidence of innate contributions to success in sport ... , the primary issue to be resolved is not how long or how hard to practice, but how and what to practice.

(p.134)

In their review of current nature-nurture perspectives on the development of sport expertise, Singer and Janelle (1999) reported that deliberately practicing 10 years or more does not guarantee expertise or even near-expertise. They suggested that athletes’ trainability of skills and adaptability to practice is greatly influenced by genetic factors. It appears that “the more favorable the genetic disposition, the more likely that dedicated practice will result in intended outcomes” (p. 134).

Ericsson et al. (1993) did not attribute an important role to innate abilities in the achievement of expertise. However, according to findings in the literature, the nature-nurture debate is far from being resolved (T. J. Bouchard, 1984; C. Bouchard & Malina, 1984; C. Bouchard, Malina, & Pérusse, 1997; Singer & Janelle, 1999; see subsequent section entitled “Innate Abilities”). Ericsson and colleagues did however state the following:

Several “personality” factors, such as individual differences in activity levels and emotionality may differentially predispose individuals toward deliberate practice as well as allow these individuals to sustain very high levels of it for extended periods. (p. 393)

Furthermore, they suggested that it was possible for early signs of natural ability or talent to be the cause for engaging in deliberate practice in early childhood. However, they advocated that the long-term development of physical and mental skills and attributes are the result of deliberate practice rather than innate talent. But who is to say that innate abilities do not play a role throughout this developmental process? No one has proved nor disproved this to date. Perhaps the genetic composition of athletes does play a role at the most elite level, enabling them to win medals at the Olympics and World Championships. Athletes may be able to sustain extensive and arduous hours of deliberate practice because they are born with a certain predisposition to do so. It is also possible for athletes who are not born with this predisposition to learn to motivate themselves to endure the required training.

Another dimension of Ericsson et al.’s (1993) theory that is debatable pertains to the enjoyment of deliberate practice. These authors stated that deliberate practice is not inherently enjoyable, however, some athletes have reported that certain deliberate practice activities are both highly relevant and enjoyable (Starkes et al., 1996; Young & Salmela, in press). It is interesting to note that Ericsson et al. developed their framework based on studies with expert and novice pianists and violinists. Thus, it is very possible that some of its dimensions are not applicable to the domain of sports. More research

needs to be conducted to clarify or modify this framework so that it fully accounts for the development of expertise in sport.

Other researchers have followed in Ericsson et al.'s (1993) footsteps and attempted to provide more information on the role of deliberate practice in sport. Côté and colleagues (Abernethy, Côté, & Baker, 1999; Côté, 1999; Côté & Hay, in press) recently studied the career development of elite Canadian and Australian athletes in rowing, tennis, gymnastics, basketball, netball, and field hockey. In one particular study, Côté (1999) conducted in-depth and open-ended interviews with 15 members of four different families in which at least one child was intensely involved in sport. More specifically, the sample consisted of four athletes (i.e., two female and one male athlete on the Canadian junior rowing team and one national level male tennis player) who were all 18 years of age, four siblings, four mothers, and three fathers.

Côté (1999) was interested in examining how family members dealt with resource, effort, and motivational constraints in the development of talent (Ericsson et al., 1993) and how these constraints affected family dynamics. He noted that one advantage of collecting data from athletes who were still young and active in their sport was that they had superior and more accurate recollections of past and current events. Another value of the study was that parents were interviewed during a period in which they still had considerable impact in their children's lives.

The findings of this study combined with those of Abernethy et al. (1999) led Côté and Hay (in press) to postulate a notable model that outlines three distinct stages of participation in sport: The sampling, specializing, and investment years. An additional stage entitled "the recreational years" accounts for individuals who wish to participate at

this level in sport. The authors suggested that at each stage, individuals can move to a subsequent stage, drop out of sport, or enter the recreational years (see Appendix A).

Côté and Hay's (in press) stages relate to those of B. S. Bloom (1985), which will be discussed in a subsequent section. Like B. S. Bloom, they described the development of athletes and the role of parents and coaches in this process. However, they also provided specific information on the type of play and practice in which the athletes engaged at different levels. They also identified the ages at which the athletes entered different stages. Their model is particularly significant because it is sport specific. They developed it based on the perspectives of not only athletes but also those of parents and siblings. Following is a description of the stages in the model.

Sampling Years

The sampling years consisted of a period in which the children participated in a wide variety of sports and activities. It was also usually the period during which they were introduced to organized sport, whereby their participation was active, voluntary, pleasurable, intrinsically motivating, and provided immediate gratification. Côté and Hay (in press) referred to this type of involvement in sport and games as "deliberate play." More specifically, they characterized deliberate play as being intentional and involving an implicit or explicit set of rules, depending on the level of organization of the sport and activities. The emphasis at this stage was on play rather than on deliberate practice and competition.

Specializing Years

During the specializing years, the children narrowed their focus on one or two sport disciplines. They typically made this choice around the age of 13 and their decision

was often influenced by the social support and encouragement they received from older siblings, parents, and coaches, as well as by the intrinsic enjoyment and success they experienced within their sport.

At this level, the emphasis was on the development of sport specific skills through more structured practice, although fun and excitement still remained central elements in the process. Côté and Hay (in press) found that in order to prevent children from becoming disinterested and dropping out, a prevalent phenomenon during adolescence (Csikszentmihalyi et al., 1993; Weinberg & Gould, 1995), deliberate practice should be balanced with deliberate play during this stage.

Investment Years

The investment years were characterized by the pursuit of a superior level of performance usually in one specific sport. Children typically reached this level around the age of 15, however, it varied depending on the sport. Similar to B. S. Bloom's (1985) stage of perfection, which is subsequently discussed, the investment years were notably more intense in terms of the time and effort the participants dedicated towards training. The main focus was on the development of skills and strategies for competition, thus, deliberate play was replaced by extensive amounts of deliberate practice.

Recreational Years

Côté and Hay (in press) included the "recreational years" in their model to account for children or athletes who could not or chose not to invest the necessary resources to participate at a high-level or did not want to focus on a single sport. The recreational years consisted of a period in which individuals practiced several sports and activities to experience enjoyment and personal growth, remain physically active, and to

maintain a healthy lifestyle. Deliberate play was often more predominant than deliberate practice at this level.

The work of Côté and Hay (in press) is innovative because it is the first time that the concept of deliberate play is introduced. Ericsson et al. (1993) advocated the notion of deliberate practice without discussing the role of play and fun at great lengths. Côté and Hay extended Ericsson et al.'s framework by suggesting that play is a significant factor in early stages of expertise development. More research will need to be conducted to determine the exact structure, role, and impact these playful activities have at different stages of development.

In sum, Côté and Hay (in press) made a significant contribution to the literature by putting forth a model that depicts children's stages of participation in sport, however, additional studies must be carried out to verify the generalization of this model to other sports. One study that led to the development of the model (Côté, 1999) only involved 15 participants of which four were athletes. Furthermore, these athletes were not the most elite in their sport. It would be interesting to see if Côté and Hay's stages would be representative in studies conducted with the best athletes in the world.

Partington (1995) was another scholar who provided empirical evidence on the importance of training in the development of expertise. He interviewed 21 renowned performers, including two concert pianists, and nineteen principal orchestra players, two of whom became conductors, to examine their career development, preparation for performance, practicing regimens, and ideal performance states. Partington found that sustained effortful practice was important for the development of skills and preparation for performance. The participants in his study reported that deliberate practice allowed

them to not only master important pieces of music but also to feel confident and relaxed, and to focus completely on creating magical moments during concerts. One musician stated:

The right way to practice is not to play just because it's the thing to do, or because your teacher tells you that it will help what you are doing.

Everything should be done for a specific reason. You are doing it with a specific result in mind. (Partington, 1995, p. 106)

Partington (1995) conducted his study with musicians however his findings are relevant to the domain of sport because athletes also spend considerable time practicing and preparing to perform. Additional results from his research are highlighted in subsequent sections.

In sum, research in this section has shown that training is a central component in the development of expert performance. The amount, type, and quality of training appear to be significant determinants in this process. As the previous citation illustrated, it is one thing to practice and simply go through the motions; it is another to practice with a specific intention to improve personal performance. It will become apparent in the next section that coaches and teachers play a crucial role in helping performers strive and maintain this type of quality training.

Teaching / Coaching

Another influential factor in the development of expert performance alluded to in the previous section is teaching and coaching. Many researchers have studied the impact of teachers and coaches at various levels of development (B. S. Bloom, 1985; Csikszentmihalyi et al., 1993; Salmela, 1996). It is noteworthy that as a result of an

increased need to develop effective and skilled teachers to enhance the quality of teaching and learning, research on expert teachers and coaches has received more attention in recent years (G. Bloom, 1996; Berliner, 1991; Côté, Salmela, Trudel et al., 1995; Sternberg & Horvath, 1995).

Ericsson (1996) stated that individuals striving to become experts must ensure they invest enough time and energy into training to develop necessary skills and attributes. Because high quality learning requires attention and the monitoring of goals and performance, it is usually facilitated by highly competent teachers or coaches. Ericsson reported that “even if students are assigned appropriate training tasks, the mere duration of practice will not be a perfect predictor of attained performance” (p. 34). Performers must thus work with qualified teachers who will give them the proper support, guidance, and feedback for continuous improvement. Furthermore, they must overcome the challenge of accessing adequate training materials and facilities for sufficient periods of time (B. S. Bloom, 1985; G. Bloom, Durand-Bush & Salmela, 1997; Côté, Salmela, & Russell, 1995; Starks et al., 1996).

It is interesting that for having put considerable emphasis on the significance of feedback and monitoring of goals, Ericsson et al. (1993) only superficially discussed the role of teachers and coaches in their theoretical framework. Singer and Janelle (1999) questioned Ericsson’s assumption that coaches always provide proper feedback and instruction that nurture the development of high-level skills:

One of the key concerns when considering deliberate practice is the implicit assumption that deliberate practice is directed toward practicing

the correct skills, and is done in a manner that will lead to expert performance. (p. 136)

Salmela (1996) conducted in-depth and open-ended interviews with 22 expert coaches to examine the development of their coaching expertise, as well as the procedures they use to develop expert athletes. He found that the coaches played a significant role in identifying and training various skills that contributed to the athletes' achievement of exceptional performance. In fact, one of their main goals was to create an environment for their athletes that was most conducive to improving performance. These coaches invested considerable time and effort into planning and structuring practices so that the highest quality of training would occur. In addition, they were concerned with creating opportunities for athletes to become more autonomous and self-directed. This is illustrated in the following citation from an expert basketball coach:

The idea is you want to develop independent thinking, creative, responsible individuals who can make decisions when they leave. Clearly, it's incumbent upon athletes to develop self-discipline and properly manage their time and priorities. There will be ups and downs, pitfalls along the way but in the end, if they've survived a rigorous, demanding, and intense athletic involvement, and if they've also done well academically, achieving their degree, what more rewarding experiences could you ask for? (Salmela, 1996, p. 50)

The previous citation suggests that there is a reduced dependence on external human resources at an elite stage because athletes become more responsible for the course of their learning and actions. In order to best prepare athletes to engage in self-

directed learning, it appears that coaches should start providing them with opportunities to exert control over their training environment in early stages of talent development.

Singer & Janelle (1998) reinforced the following fact:

The learner is more inclined to be actively involved in self-instruction when given the opportunity to do so ... Also, by directly involving the learner in the learning process, responsibility for acquiring the skill is assumed by the learner, leading to greater effort, persistence, and satisfaction. (p. 138)

In sum, Salmela's (1996) study was instrumental because very little research has focused on the development of expert coaches, more specifically, coaches of team sports. The coaches shared important information regarding the development of their own expert performance and that of elite athletes as well. One limitation of this study however was that only the perspectives of coaches were examined. The perceptions of athletes must also be investigated and compared to those of their coaches if the development of expert performance in sport is to be truly understood.

Another seminal study that has shed light on the development of expertise and the role of coaches and teachers in this process was conducted by B. S. Bloom (1985). Bloom was particularly concerned with the process of talent development in young people from their early involvement in a field to the culmination of their career as expert performers. Using a retrospective and inductive approach, he interviewed 120 talented performers including Olympic swimmers, world-class tennis players, concert pianists, sculptors, research mathematicians, and research neurologists. A significant finding of his study was that talent development requires years of commitment, and central to this process is

the amount and quality of support and instruction children receive from their parents and teachers or coaches.

B. S. Bloom (1985) was innovative in that he identified three distinct stages of talent development: Early Years - Stage of Initiation, Middle Years - Stage of Development, and Late Years - Stage of Perfection. These stages provide excellent guidelines for performers as well as their teachers and parents, however, B. S. Bloom indicated that they are only “signposts along a long and continuous learning process” (p. 537).

Early Years - Stage of Initiation

B. S. Bloom (1985) discovered that the participants in his study first went through an initiation stage, in which they engaged in fun and playful activities. As children, they were excited about their participation and relied heavily on their teacher or coach for guidance and support. It was predominantly during this early stage that parents and/or teachers noticed that certain children appeared to be gifted, talented or “special” in some way. These attributions of special qualities affected both the expectations for the children and the methods used for teaching. Starkes et al. (1996) also found that coaches in their study claimed to be able to detect talent even though they had a difficulty articulating how this was accomplished.

During the stage of initiation, teachers or coaches generally adopted a process-oriented approach in their teaching, and thus encouraged and rewarded the children for their effort rather than the outcome of their participation. Although teachers and coaches were not necessarily technically advanced at this stage, they provided the love and

positive reinforcement the children needed to keep learning and performing activities (B. S. Bloom, 1985).

Middle Years - Stage of Development

Eventually, the participants moved on to a stage of development where they became, as B. S. Bloom (1985) termed it, “hooked” on their particular activity. For example, they were “gymnasts” rather than “children who did gymnastics.” Their pursuits were more serious and consequently, higher levels of dedication were witnessed. The participants became more achievement-oriented as practice time was significantly increased and competition became the yardstick for measuring progress. Teachers or coaches at this stage were usually more technically skilled than those at the previous level. They emphasized the development of proper technique, provided children with opportunities to evaluate their performance and expected results through discipline and a hard work ethic. B. S. Bloom found that teachers and coaches took a strong personal interest in the development of the participants at this stage, and the loving relationship the children had with their teachers or coaches during the initial stage was often replaced by one of respect.

Late Years - Stage of Perfection

According to B. S. Bloom (1985), it was in the final stage, the one of perfection, that the participants became experts. They were radically obsessed by their chosen activity, which dominated their lives at this point. The emphasis was now placed upon the development of high-level skills, and they were willing to invest the necessary time and effort required to achieve their ultimate performance goals. Furthermore, the performers were more autonomous and knowledgeable and thus became more responsible for their

training and competitions. B. S. Bloom revealed that because the mentors or master teachers at this level placed enormous demands on the performers, they sometimes became feared, but always respected.

In sum, B. S. Bloom (1985) largely contributed to the advancement of knowledge in the field of expertise. By using a qualitative approach with expert performers in different fields, he elicited data on the global process of talent development from the early childhood years to the later and more demanding years of talent perfection. He also provided important empirical information on the role of coaches and teachers in this process. In light of the topic of sport expertise, one potential limitation of his research is that the stages he outlined were not sport-specific. Although his sample comprised 120 performers, he only included 18 tennis players and 21 swimmers. Nonetheless, his research has had a tremendous impact on the work of several other scholars including Côté (1999), Ericsson (1996), and Csikszentmihalyi et al. (1993).

Csikszentmihalyi and colleagues (1993) were also interested in investigating the development of expertise and the role of teachers in this process. They conducted a longitudinal study over a period of four years with 208 high school students excelling in the domains of art, athletics, mathematics, music, and sciences. Their focus centered on performers who had reached what B. S. Bloom (1985) entitled the “middle years.” They examined variables such as personality traits, family interactions, education, and social environment, and also identified factors involved in the loss of achievement potential over the years.

One innovative feature of their study was the methodology they used to collect their data. In attempting to chart the development of talented teenagers throughout their

high school years, Csikszentmihalyi and colleagues (1993) used a two-part strategy. In the first phase of their study, they used the Experience Sampling Method (ESM), a naturalistic approach that enabled them to investigate subjective mood states. The participants carried an electronic pager for seven consecutive days and the researchers randomly sent seven to nine signals each day at different times, for an average total of 60 signals for the week. Immediately after each signal, the participants had to respond by filling out the ESM form and provide a detailed report of their activities, thoughts, companions, and feelings. In the second phase of the study, the researchers were more concerned with the actual development of the adolescents' performance. In order to provide an accurate account of this process, they used both "hard" objective indices of achievement such as grades, and "soft" subjective ratings of accomplishment that were obtained by the teachers and the students themselves.

This study generated many significant findings, some of which pertained to teaching and coaching. According to the talented teenagers, the most influential and memorable teachers in their lives were those who: a) loved their work, b) perceived their emerging needs and interests, c) provided a secure environment for extending their skills, d) inspired them to recognize intrinsic rewards, e) gave them the freedom to make choices and be creative, and f) minimized extrinsic pressures like competition, grades, rules, and bureaucratic procedures.

The participants also demonstrated a preference for teachers who gave immediate and constant feedback that was informational rather than controlling. Csikszentmihalyi et al. (1993) stated that "the less students' egos are threatened [by controlling feedback], the more unself-consciously they can become immersed in their work" (p.220), thus the more

they can experience flow. They further suggested that “Only those teachers who translate their own interest into flow conditions for students will succeed in catalyzing talent development” (p. 185). Results that specifically pertained to flow and enjoyment will be discussed in a subsequent section.

As in most studies, there were certain limitations in Csikszentmihalyi et al.’s (1993) methodological framework. To begin with, the ESM method was only carried out over a period of one week and one must question if that week was representative of the participants’ activities throughout the year. Also, there was a certain risk in using the teachers’ subjective interpretations to identify the talented individuals at the onset of the study because they had not known them for a long period of time. The ratings of accomplishment of both the teachers and students might also be interpreted with caution because they were subjective in nature. Regardless of these limitations, it is noteworthy that both quantitative and qualitative methods were used to collect extensive amounts of data over a lengthy time frame. The magnitude and overall quality of the study definitely needs to be acknowledged and appreciated.

Partington (1995) also examined the role of teachers or master coaches in his study. He found that during early stages of development, the participants were exposed to teachers who nurtured their creativity, taught them how to practice intelligently, gave them constructive feedback, and made learning fun. These teachers believed in the performers’ potential to succeed. They were committed to helping them improve and initiated them to deliberate practice early in their career.

Research has shown that teachers or coaches who believe and have confidence in their students or athletes have a positive impact on their performance. This phenomenon

has been referred to as the Pygmalion effect (Horn & Cox, 1993; Sinclair & Vealey, 1989). The Pygmalion effect occurs when the expectations of teachers or coaches lead to the actualization of these desired expectations. Essentially, their expectations are based on their observations and beliefs in certain characteristics and skills that make up the talent of individuals. As expectations are verbally and non-verbally communicated over time, the performance of these individuals conforms to initial expectations. Their expectations and beliefs thus become a self-fulfilling prophecy.

Indeed, excellent teachers and coaches possess certain perspectives and characteristics that appear to maximize the effectiveness of their interventions with performers. Some researchers would argue that in many cases, they adopt a more constructivist approach, which has been shown to be extremely valuable in teaching (Larochelle & Bednarz, 1994). In the constructivist view of learning, individuals use their own existing knowledge and prior experiences to understand new information. Furthermore, when they are actively involved in processing information and reconstructing it in personally meaningful ways, they are more likely to remember it and apply it to other situations.

In contrast to traditional teaching-learning models in which individuals were passive rather than active learners, the constructivist model “places students at the center of the process - actively participating in thinking and discussing ideas while making meaning for themselves” (King, 1993, p. 30). Teachers facilitate learning in less directive ways, allowing students to interact with information, manipulate, and relate it to what they already know. They organize the context, provide resources, and question the students to stimulate critical thinking and develop personal problem-solving approaches

(Glaserfeld, 1985; King, 1993). Research has shown that teachers and coaches who have significantly contributed to the development of expert performance often adopt this style of teaching (G. Bloom, 1996; Durand-Bush & Salmela, 1996; Salmela, 1996).

Another seminal study that shed more light on the role of coaches in the development of expert athletes was conducted by Côté, Salmela, Trudel et al. (1995). These scholars interviewed 17 expert Canadian gymnastics coaches to examine the factors that influenced their knowledge in developing elite gymnasts. The inductive analysis of the data led them to postulate a model in which factors affecting the coaching process were categorized under three central components, that is, competition, organization, and training, as well as three peripheral components including coach's personal characteristics, athlete's personal characteristics and level of development, and context (see Appendix B). Côté, Salmela, Trudel et al.'s model is notable because it provided a comprehensive framework to explain the process of coaching and to guide the actual practice of coaches in applied settings. One limitation is that it was developed based on retrospective interview data elicited from gymnastics coaches only, thus it is not known if the model is applicable to most other sports.

Recently, Gilbert and Trudel (in press) validated Côté, Salmela, Trudel et al.'s (1995) coaching model in a team sport context. They conducted a single-case study with an experienced university hockey coach using interviews and direct observations of the coach's actions over an entire season of play. Gilbert and Trudel corroborated all of the components found in the coaching model and also provided support for many of the categories identified within these components, despite significant contextual differences existing between the sports of hockey and gymnastics. These authors noted that their

findings could not be generalized to the entire population of coaches because their study was based on a single case. They recommended that more research be conducted to continue the validation of Côté, Salmela, Trudel et al.'s coaching model in other sporting contexts.

In sum, research has shown that the development of expertise is a dynamic, ongoing process that involves more than just the performers themselves. Teachers and coaches appear to play different but significant roles throughout their lives. According to researchers like B. S. Bloom (1985), Salmela (1996), Csikszentmihalyi et al. (1993), and Partington (1995), these individuals strive to create an environment in which performers can express themselves, extend their skills, and also have fun. Although the findings of Bloom, Csikszentmihalyi and colleagues and Partington are insightful, they did not specifically focus on the context of sports. Côté, Salmela, Trudel et al. (1995) postulated an important coaching model to guide the development of athletes however so far it has only been validated in the sports of hockey and gymnastics. Overall, more research must be conducted in the domain of sport to clearly identify the roles, responsibilities, and contributions of coaches in the talent development process.

Parental Support

Parents also appear to play a meaningful role in the development of expert performance yet research involving them is sparse. B. S. Bloom (1985) made a significant contribution to the literature by interviewing the parents of the participants in his study. He found that they were very important in their lives. Overall, the parents reported that they “raised their children to believe in the importance of doing something well, to place work and duties before pleasure, to believe in the importance of hard work,

and to strive for future goals” (p. 539). As a result of their interest in a particular field or activity, the parents were often responsible for initially getting their children interested in that same field or activity. They shared their excitement and provided the necessary love and support their children required to remain involved in the early years of development.

B. S. Bloom (1985) revealed that in subsequent demanding stages of development, the parents provided both moral and financial support to sustain their children’s involvement in their activity. They also helped restrict outside activities such as work and outings with friends, while still showing concern for the total development of their children. Interestingly, they played a lesser role in later developmental years because the participants were completely immersed in their actions and assumed total responsibility for them. Csikszentmihalyi and colleagues (1993) found similar results to those of B. S. Bloom in terms of the support, time, energy, and money required from parents to develop the talents of their gifted children.

Côté (1999) attempted to shed more light on the role of families in the development of young athletes. More specifically, he was interested in investigating how family members supported children in their initiation and development of high-level performance. He also attempted to determine whether certain patterns of family dynamics contributed to the success of athletes at different stages of participation in sport (see model in Appendix A).

Côté (1999) found that during the sampling years, children and siblings were encouraged by their parents to experiment with different sports and games for pure pleasure rather than for attaining specific goals. The children were not pressured to choose one sport discipline over another. Instead, they were motivated to sample the

benefits of various activities. The parents were concerned with providing their children with opportunities to have fun and develop fundamental motor skills, positive identities, motivations, values, and beliefs about sport and physical activity. Consequently, play was more predominant than practice and competition during this period.

Of particular interest is that the parents in three out of the four families revealed that they felt their child had a special gift for sport during the sampling years. This could have led to increased supportive behaviors, such as encouragement and positive reinforcement for skill and effort. This also suggests that parents' beliefs can reinforce their children's self-beliefs, which according to Dweck (1986), are determinants of progress and persistence.

During the specializing years, the parents continued to develop their interest in their children's sport and thus got involved at differing levels, from spectator to coach. They also invested considerable time and money to support their children's participation. In terms of older siblings, Côté (1999) found that they often acted as role models and had a positive influence on the work ethic of the athletes. It is noteworthy that the parents in all four families attributed more importance to achievement in school than to that in sport. Due to the fact that school and sport were priorities in their children's lives, they did not expect them to work outside of the home. Csikszentmihalyi et al. (1993) also found this in their study.

In terms of the investment years, the parents showed great interest in their children's career and provided emotional and financial support to sustain their involvement in sport, just like during the specializing years. They also helped their children cope with setbacks such as injuries, failure, and lack of motivation. Due to the

high-level participation of their one child, there was an uneven distribution of resources within the family, which often created tension and jealousy among the siblings. Although the parents were consciously aware of this, their belief in their talented child was enough to justify their actions toward all of their children.

In sum, Côté's (1999) study demonstrated that parents play a significant role throughout their children's career in sport. It appears that siblings can have a positive or negative impact on the development of athletes depending on the type of relationship they have with them. They can act as positive role models or constrain some of their resources because they are jealous and want attention. Côté and Hay's (in press) stages of participation provide useful guidelines for parents and siblings to nurture and monitor talent in athletes. A significant finding in their study was that skill development and enjoyment were the most important factors for keeping children involved in sport and helping them progress through stages of development. Knowing this, appropriate environments can be created by parents to enable their children to experience fun and success at each level, but more particularly when they are young and perhaps more sensitive to various elements of participation in sport.

Partington (1995) found that some musicians in his study reported having a natural predisposition to music (i.e., perfect pitch) in their early childhood, however, most of them talked about being predisposed to music because it had been part of their family for several generations. Thus in the early years, they had the support and encouragement from family members to get involved in the field of music and furthermore, to pursue a career in this field.

In sum, it is evident that more research needs to be conducted to expand existing findings regarding the role that parents play in the development of sport expertise. Very few researchers have concentrated their efforts on this topic.

Enjoyment

There is no doubt that developing experts need to thoroughly enjoy what they do to remain involved in their domain for a lengthy period of time, in some cases for a major part of their lives. In fact, research has shown that enjoyment is a key motive for remaining involved in both youth and high-level sport (Klint & Weiss, 1987). Weinberg and Gould (1995) found that youth sport athletes are more likely to drop out of sport programs when they do not experience enough enjoyment.

Scanlan and colleagues (1989) interviewed 26 former elite figure skaters to identify their sources of enjoyment during the most competitive phase of their skating career. Their major sources of enjoyment included social and life opportunities, perceived competence, social recognition of competence, and the act of skating. Scanlan et al. revealed that their study contributed to the enjoyment literature because contrary to popular belief, they identified *enduring* sources of enjoyment that remained salient throughout the career of the elite athletes.

Csikszentmihalyi and colleagues (1993) also found that the performers in their study inherently enjoyed practicing and performing their chosen activity. They noted that “to reach exceptional levels of performance requires a single-minded dedication that will not occur unless one enjoys what one is doing” (p. 148). They also reported that performers cannot develop their talent without both immediate and long-term intrinsic *and* extrinsic rewards. Unless these individuals are motivated to learn and receive

external rewards like recognition, praise, and support from significant others, even the best training materials, facilities, and learning environments will not lead to the development of expertise.

In other studies conducted with expert pianists and violinists, Ericsson and colleagues (1993) found that these performers did not always live pleasurable moments. In fact, they had to deal with motivational challenges to remain engaged in high-quality training on a regular basis. This was mainly due to the fact that their effortful training was not generally pleasant and immediately rewarding, that is, it did not lead to immediate social and monetary rewards. Based on the findings of their studies, Ericsson et al. emphasized the importance of staying motivated in order to be able to persevere and continue improving performance during trying moments. They suggested that individuals who engage in deliberate practice are in part motivated by the fact that practice leads to improved performance.

Partington (1995) found that some of the musicians in his study enjoyed practicing while others did not, at least not all of the time. One participant stated, "I have been definitely committed and dedicated, especially in the formative years. I enjoyed practicing and I looked forward to it (p. 21)." Partington also noted that certain orientations were required in practice in order for it to be effective but that these orientations were paradoxical. For example, the performers prepared themselves physically and emotionally to be able to concentrate and improve during practice but at the same time, they aimed to be physically relaxed and to enjoy the music while they were practicing. This suggests that the performers needed to both extend their skills and enjoy themselves to get the most out of their practice sessions.

Ericsson et al.'s (1993) finding that deliberate practice or effortful training is not inherently enjoyable is debatable because various musicians and athletes have reported that some deliberate practice activities are both highly relevant and enjoyable (Partington, 1995; Starkes et al., 1996; Young & Salmela, in press). Young and Salmela studied the development of 81 Canadian national, provincial, and club-level middle distance runners. Referring to the training diaries they kept over the years, the runners identified their practice patterns and performance levels for the initial nine years of their career. In particular, they rated lists of track practice activities, track-related activities, and everyday activities based on their relevance for improving performance, the amount of effort and concentration required to perform them, and also according to how enjoyable they were. Contrary to Ericsson et al.'s contention that deliberate practice is not enjoyable, it was found that the two most relevant and effortful activities in middle distance running were perceived to be highly enjoyable compared to all other practice activities.

Watanabe (2000) also found similar results after administering a questionnaire to 237 male and female competitive swimmers from three different performance groups. The participants were asked to rate deliberate practice activities related to swimming based on how relevant, enjoyable, and physically and mentally effortful they were. A total of 18 swimmers who had rated deliberate practice as pleasurable were subsequently interviewed to examine their reasons for enjoying deliberate practice activities. The two most frequent reasons were related to the actual performance of the activity. They included the challenge provided by these activities and the mastery of skills. The next two reasons were that deliberate practice led to positive results and provided

opportunities to socialize. These concerned more the outcome and the context of performing the deliberate practice activities. The fact that the athletes in this study enjoyed deliberate practice once again contradicts Ericsson et al.'s (1993) finding that highly relevant and effortful training activities are not enjoyable and that enjoyment is only dependent upon successful outcomes and the social nature of sport.

The findings of Young and Salmela (in press), Watanabe (2000), and Starkes et al. (1996) are not that surprising considering that enjoyment was found to be a central reason why athletes remain involved in their sport at all levels of participation over an extended period of time (Côté & Hay, in press; Csikszentmihalyi et al., 1993). Young and Salmela suggested that if practice is relatively enjoyable, then the very nature of deliberate practice may facilitate the continued commitment and persistence of athletes in sport. Evidently, future research is warranted to further clarify the enjoyment dimension and hedonic states associated with deliberate practice, at least in the domain of sport.

Flow

Csikszentmihalyi and collaborators (1993) discussed the importance of enjoyment in their study and found that a significant source of enjoyment and motivation in the lives of talented teenagers was the experience of flow. According to them, flow is a subjective state that is experienced when individuals are completely connected to a task, to the point of losing track of time, and of being unaware of fatigue and everything else besides the activity itself. Flow is relatively rare in everyday life, however, it can occur if external and internal conditions of individuals are at optimal levels. It is interesting that these authors characterized flow based on the following theoretical assumption:

The development of talent requires a peculiar mind-set, based on habits cultivated in one's early environment that eventually become so ingrained that they end up forming something like a personality trait... this mind-set [is called] a complex attentional structure, or a complex consciousness, or a complex self. (p. 11)

Csikszentmihalyi et al. (1993) further defined this complex attentional structure using a dialectical model that included two opposing processes: integration and differentiation. They entitled this model "the flow model of optimal experience." The two processes of integration and differentiation are interrelated and extremely important because only when combined together do they best explain the development of expertise.

Csikszentmihalyi and colleagues (1993) made the interesting observation that flow eventually makes training and performing more complex because to keep enjoying an activity, individuals need to seek new challenges to avoid boredom, and perfect new skills in order to avoid anxiety. Therefore, people need to *differentiate* new challenges in the environment and also *integrate* new abilities in their repertoire of skills. They summarized flow the following way:

The reason for expecting that the flow experience will be involved in the development of talent is that flow usually begins when a person takes on challenges that are just above her or his skills. This is the phase of change or differentiation; to be enjoyable, this phase must be followed by a stabilizing or integrating phase when skills appropriate to the challenge are developed. The completion of the activity, at the conclusion of a cycle of

differentiation and integration, results in stretching or extending the person's being. (p. 16)

Interestingly enough, we can see a link between Ericsson and colleagues' (1993) definition of deliberate practice and Csikszentmihalyi et al.'s (1993) interpretation of the flow process. The latter postulated that the result of flow is to extend one's limits, knowledge or skills, which is also the goal and result of deliberate practice. Despite this, there is a discrepancy between the two concepts in that flow is believed to be an enjoyable experience while deliberate practice is not, at least, according to Ericsson and colleagues.

In this particular situation, the notion of deliberate practice could be best compared to the initial part of the flow process, the phase of differentiation, in which individuals accept challenges that are beyond their perceived skills to improve performance. However, if we extend Ericsson et al.'s (1993) notion of deliberate practice and incorporate Csikszentmihalyi et al.'s (1993) phase of integration, in which an activity is enjoyable because the skills being performed are appropriate to the challenge, we add a new dimension to the concept of deliberate practice. From this perspective, engaging in deliberate practice could be an enjoyable experience. In fact, according to Csikszentmihalyi and colleagues, individuals do not extend themselves until they go through a cycle of both differentiation and integration, that is, until they perfect or learn a new skill, *and* also experience or derive some enjoyment from it.

Partington (1995) provided an interesting citation in his study that somewhat illustrates this cycle of differentiation and integration. It also highlights the inevitable motivational and effort constraints with which the musicians had to deal:

When you first start an instrument, it's fun for a while, but there is always a point when you come up against a wall that you can only get beyond by methodically working and practicing. That's when you think it's not fun anymore. That stage is necessary. Once you get beyond that stage, you realize that once you work out the technical difficulties, you get better. Then you get into a cycle. The more you practice, the better you get, and you get on a roll. (p. 17)

Extended preparation and self-confidence were perceived by these musicians as essential ingredients to perform successfully and to experience flow. One player revealed that "to perform well you have to know the piece thoroughly, and by knowing it you can sort of sit aside and see the music as it's going by" (p. 84). Flow during musical performances was a state aspired by many of the performers and interestingly, it occurred individually when solos were played and also collectively when all members of the orchestra were both spiritually and musically connected. This suggests that both individual and team sport athletes could experience flow under appropriate circumstances.

Jackson (1995) conducted a study in which she examined factors that influenced the flow experiences of elite athletes. She conducted interviews with 28 elite level athletes from seven sports and asked them what facilitated, prevented, and disrupted flow. An inductive content analysis of the transcripts revealed that several factors affected whether or not the athletes experienced flow. The most salient ones included: physical and mental preparation, confidence, focus, the feeling and progression of performance, and optimal motivation and arousal levels. It is interesting that most

athletes perceived flow to be a controllable state, that is, a state they could purposefully get into rather than a state that just occurred haphazardly.

Enjoyment and flow appear to be part of the process of talent development, however, talented people do not constantly live pleasurable moments. Csikszentmihalyi et al. (1993) found that “what characterizes people who use their skills to the utmost is that they enjoy the hardships and the challenges of their task” (p. 8). In other words, experts do not necessarily encounter more enjoyable experiences, they have the tendency of viewing difficult situations as positive and challenging ones.

Individuals who become the best in a domain are often envied, however, it is important to consider that they have a tremendous price to pay. Csikszentmihalyi and colleagues (1993) found that although the participants in their study regularly experienced flow, they often had to trade-off immediate enjoyment that normal adolescents experienced when socializing with friends, watching television, and making money through part-time work. Motivation was therefore key in their developmental process.

Perhaps one of the most important findings of Csikszentmihalyi et al.’s (1993) study is that when individuals experience flow, the likelihood that they will continue to develop their expertise is significantly increased. These authors observed that the students’ flow experiences in their talent area were significantly related to engagement and this was partly due to the fact that flow was a source of enjoyment and motivation in their lives.

Csikszentmihalyi and colleagues (1993) provided significant information regarding the importance of enjoyment, motivation, and flow in the development of

expertise. However, a limitation regarding the experience sampling form that the participants used to record their thoughts after each signal needs to be raised. This form was designed to measure both external (time, location, type of activity, and companionship) and internal (physical, cognitive, emotional, and motivational) dimensions of their experience. It is interesting to note that although some of the questions on this form implicitly alluded to the experience of flow, none of them explicitly targeted the notions of extending oneself, enjoyment, or being completely connected to a task. Csikszentmihalyi et al. (1993) said that they focused a special attention on the “intensity of those states most centrally implicated in the flow experience” (p. 54) when designing their experience sampling form yet certain important components of flow did not appear to be addressed.

In sum, the research discussed in this section demonstrated that enjoyment is extremely important in the development of expert performance. When individuals enjoy what they do, they are more likely to overcome motivational constraints and remain engaged in their talent area. The experience of flow appears to contribute to the development of exceptional abilities because it is enjoyable and it challenges performers to continue improving their skills to experience more flow. More research should be conducted to further examine the role that flow plays at different stages of talent development in sport. Some researchers have identified different sources of enjoyment in sport, one of which is effortful training (Watanabe, 2000; Young & Salmela, in press). However, Ericsson et al. (1993) postulated in their deliberate practice framework that such types of training activities are not enjoyable. More research is required to determine

what types of training activities are most enjoyable in sport and how these can contribute to the development of performance at different stages of an athlete's career.

Recovery

The development of expertise requires not only enjoyment and motivation but also effort and recovery. As expert performers climb the ladder of success, they are required to accomplish many high-quality tasks that demand effort, intensity, and also recovery (G. Bloom, Durand-Bush & Salmela, 1997; Ericsson, 1996).

Studies have shown that in the process of achieving outstanding skills, performers must balance the amount of effort and energy they spend in their talent domain with adequate recovery periods to prevent overtraining, staleness, and burnout (Ericsson, 1996; Morgan et al., 1987; Weinberg & Gould, 1995). According to Ericsson and Charness (1994), high quality training requires effort and can only be sustained for a limited time each day without leading to exhaustion. Because the physical and mental resources of human beings are limited, recovery periods are extremely important and must accordingly be incorporated in training schedules. The process by which performers are able to supply the effort required to achieve outstanding performance and balance their effort with appropriate recovery periods in order to prevent exhaustion and burnout has often been referred to as "learned industriousness" (Eisenberger, 1998). Ericsson et al. (1993) summarized the effects of the effort constraint as follows:

Disregard of the effort constraint on deliberate practice leads to injury and even failure. In the short term, optimal deliberate practice maintains equilibrium between effort and recovery. In the long term, it negotiates the effort constraint by

slow, regular increases in amounts of practice that allow for adaptation to increased demands. (p. 371)

Morgan et al. (1987) found that as athletes become overtrained, they often experience psychological and physiological disturbances. They can exhibit low vigor and increased tension, depression, anger, fatigue, and confusion. Some researchers have also found that overtrained athletes experience hormonal changes, higher resting heart rates and blood pressure, loss of body weight and fat, and chronic muscle soreness (Kirwin, Costill, Flynn, Mitchell, Fink, Neuffer, & Houmard, 1988). Of importance is that athletes having the overtraining syndrome are at significantly greater risk for injuries and illnesses. Due to the fact that early physiological markers have not been clearly established and only seem to appear when the syndrome is full-blown, it has been advocated that coaches closely monitor athletes' self-reports of effort and psychological state when there is a concern that they might be getting overtrained (Levin, 1991).

In sum, research has shown that overtraining is a prevalent concern in sport and increasingly sophisticated strategies are being developed to monitor this condition and to help athletes balance their effort with adequate recovery periods. Most research in this domain has been quantitative in nature and conducted in laboratories. It would be interesting to examine recovery and overtraining using a more qualitative approach with both coaches and athletes.

Age

Aside from the various factors discussed so far, age was also identified in the literature as a factor affecting the development of exceptional abilities. Expert performers often start training at a young age, some as early as five years old (Weinberg & Gould,

1995). The age of onset of practice is an influential factor in Ericsson et al.'s (1993) model of expertise. These authors suggested that individuals who begin deliberate practice at an earlier age will accumulate more hours of deliberate practice and thus have a better chance of achieving expert performance. They stated that "individual differences in performance at a given age are a function of acquired characteristics, which in turn are directly related to the accumulated amounts of deliberate practice" (p. 388). In addition, it is doubtful that an individual with less accumulated practice at some age will catch up with the best individuals who started deliberate practice earlier and maintained optimal levels of practice that did not lead either to exhaustion or burnout. Based on this information, one could thus conclude that it is important to initiate children to structured practice as early as possible as it might seriously jeopardize their chances of attaining high levels of performance in their chosen domain.

Despite current empirical findings, the age at which children should begin formal instruction is still questionable. There is evidence showing that engaging in structured training at a young age where too much emphasis is placed on outcomes and performance rather than play can have negative effects on the enjoyment, motivation, self-esteem, and family life of children (Weinberg & Gould, 1995). More research needs to be conducted to verify the impact of the age at which children are introduced to formal training and competition. Despite this, one must keep in mind that in sport, there is generally a critical age span during which peak performances can be attained because of limiting physical and physiological factors (Bouchard, Malina, & Pérusse, 1997). If athletes do not respect this age span, it might make it more difficult for them to achieve exceptional performance.

Age appears to be an important factor to consider not only during childhood but also during later stages of adulthood. Studies have shown that several body functions start declining with age unless they are trained (Haywood, 1993). This suggests that practice is not only important for the development of high-level skills but also for maintaining them in later years (Krampe & Ericsson, 1996; Shephard, 1994).

Mental Skills and Attributes

Research in the field of sport psychology has shown that certain mental skills and attributes play a significant role in achieving excellence in sport (Barbour, 1994; Botterill, 1990; Gould, Eklund, & Jackson, 1992; Mahoney, Gabriel, & Perkins, 1987; McCaffrey & Orlick, 1989; Orlick, 1996; Orlick & Partington, 1988). One study that was paramount in demonstrating the importance of mental skills in high level sport was conducted by Orlick and Partington (1988). These researchers assessed the mental readiness of 235 Canadian Olympic athletes through questionnaires and individual interviews and identified “success elements” that distinguished successful from unsuccessful athletes. Successful athletes: (a) possessed a high level of commitment; (b) set clear short- and long-term goals; (c) did imagery and simulation training; (d) focused and refocused under distractions; (e) had an established mental training plan that was used and refined throughout the season; and (f) had clearly established mental plans for competition, which included pre-competition and competition mental plans, distraction control plans and constructive evaluation plans. Orlick and Partington also found that between physical, technical, and mental preparation, mental preparation was the only variable to significantly predict the athletes’ actual Olympic placings.

Another study attempting to uncover some of the mental skills linked to exceptional athletic performance was conducted by Mahoney and colleagues (1987). Based on their work with collegiate and Olympic athletes, they developed the Psychological Skills Inventory for Sport (PSIS), and administered it to 713 male and female athletes. Selected across 23 different sports, these athletes were either competing at an elite, pre-elite, or non-elite collegiate level. They found that the top level athletes in their study were: (a) more confident, (b) better able to focus before and during competition, (c) less anxious, (d) more committed to excelling in their sport, and (e) had better internally-focused imagery abilities, than competitive athletes in lower ranks. Note that the validity and reliability of the PSIS is questionable (Chartrand, Jowdy, & Danish, 1992) thus the results of this study have to be interpreted with caution.

In another study, Grove and Hanrahan (1988) assessed the psychological strengths and weaknesses of 39 interstate and international level field hockey players training at the Australian Institute of Sport using the Self-Analysis of Mental Skills questionnaire (SAMS). Participants had to rank-order the following six general scales from what they did best to what they did worst: concentration, emotional control, self-confidence, control of nervousness or tension, use of imagery, and planning or analysis. They ranked control of nervousness or tension and concentration as their best mental skills, and use of imagery and self-confidence as their worst.

Of interest was that five coaches who had daily contact with these athletes were also asked to rank the same skills as the athletes, based on their perception of the players' strengths and weaknesses. Significant discrepancies were found between the rankings of the athletes and those of the coaches. Coaches perceived athletes to be good at

maintaining self-confidence, while the athletes perceived the opposite. Coaches also perceived their players to be poor at controlling emotions and tension while the athletes reported themselves as being proficient at these skills. These discrepancies highlight the importance of communication between coaches and athletes. If coaches want to be effective in their teaching and interpersonal relations, they should be aware of their athletes' expectations and perceptions of personal strengths and weaknesses. Results from Grove and Hanrahan's (1988) study must also be interpreted with caution because no evidence was provided on the validity and reliability of the SAMS questionnaire and the effectiveness of using a rank-order format rather than a continuous scale.

Other mental skills, perspectives, and techniques that have been perceived to be important for consistently performing at a high level in sport include: goal-setting (Burton, 1993; Locke & Latham, 1985; Weinberg, Stichter, & Richardson, 1994), commitment (Ericsson et al., 1993; Orlick, 1996; Scanlan et al., 1989) and self-confidence, (Orlick, 1996; Vealey 1986). After 20 years of research and applied work with exceptional performers, Orlick (1996) postulated in a "model of human excellence" that commitment and self-confidence were the most important psychological variables associated with elite performance. He found that they were significant precursors of effective mental preparation.

Bota (1993) obtained similar findings after conducting analyses with the Ottawa Mental Skills Assessment Tool (OMSAT), an instrument developed to measure a broad range of mental skills. He found that self-confidence, commitment, and goal-setting were the best discriminating scales between elite and less elite athletes. As a result, he suggested that goal-setting be considered another fundamental element of success.

Simonton (1992) also found that commitment played a key role across different domains of expertise. In a study conducted by Baumeister (1994), individuals having an ability to resist stress and anxiety and to control their emotions were better able to deal with negative events and remain committed. These findings are similar to those of Porter and Cattell (1972) who suggested that individuals who are emotionally stable are more constant in their interests and level of commitment.

Starkes and colleagues (1996) asked Canadian national team figure skaters and their coaches to rate a series of factors linked to success in skating. Their highly correlated perceptions were that persistence, motivation, dedication to hard work, mental stability, inner strength, a no-nonsense attitude, determination, and love of the sport were all indicators of talent. Furthermore, all coaches agreed that determination or desire was a significant contributing variable to the development of expertise.

Mental skills and perspectives associated with the regulation of intensity or arousal have also been linked to consistent high-level performance (Landers & Boutcher, 1998). More specifically, stress and fear control (Rotella & Lerner, 1993; Selye, 1974; Smith & Smoll, 1990; Smith, Smoll, & Weichman, 1998), relaxation (Jacobson, 1930; Williams & Harris, 1998), and activation (Williams & Harris, 1998; Zaichkowsky & Takenaka, 1993) have been shown to contribute to the success of athletes.

Several researchers have also examined the nature and importance of concentration and distraction control (Boutcher, 1993; Nideffer & Sagal, 1998; Orlick, 1996; Orlick & Partington, 1988). In fact, Nideffer and Sagal stated that “concentration is often the deciding factor in athletic competition” (p. 296). Athletes must be able to not only focus effectively but also refocus their attention when distracted by internal or

external stimuli (Boutcher, 1993; Orlick, 1996). Orlick noted that although distraction control or refocusing is an extremely important skill, it is often the least practiced by athletes.

Other psychological skills relevant to the improvement of athletic performance include imagery and mental practice (Feltz & Landers, 1983; Orlick, 1996; Vealey & Greenleaf, 1998). Although imagery and mental practice are related and often used interchangeably, research has shown that the two constructs should be differentiated (Murphy & Jowdy, 1993). While imagery refers to a “mental process” involving quasi-sensory and quasi-perceptual experiences, mental practice relates to a “technique” used by individuals to engage in introspective or covert rehearsal. Mental practice can but does not necessarily have to involve imagery. According to Murphy and Jowdy, imagery and mental practice can facilitate skill acquisition and maintenance, as well as help athletes increase their self-awareness and confidence, regulate their arousal, emotions, and pain, and enhance their competition planning strategies.

Orlick and Partington (1986) made a significant contribution to the literature when they produced a book based on their study with accomplished Canadian Olympic athletes following the 1984 Olympic Games. This study led to the paramount article they wrote in 1988 that was frequently cited in this literature review. Orlick and Partington found that the best athletes in the world had extremely well-developed imagery skills that they used on a daily basis. One Olympic champion reported:

I did my dives in my head all the time. At night, before going to sleep, I always did my dives. Ten dives. I started with a front dive, the first one that I had to do at the Olympics, and I did everything as if I was actually

there. I saw myself on the board with the same bathing suit. Everything was the same. I saw myself in the pool at the Olympics doing my dives. If the dive was wrong, I went back and started over again. It takes a good hour to do perfect imagery of all my dives but for me it was better than a workout. (p. 23)

Competition planning is certainly another valuable skill in the achievement of exceptional performance. Orlick and Partington (1988) found that the athletes had clearly established competition plans that helped them prepare to focus and refocus before and during events, as well as evaluate their performance after events. In another study, Gould et al. (1992) revealed that Olympic wrestling champions adhered to their mental preparation plans and precompetition routines, and were better able to cope with distractions and unforeseen circumstances than non-medallists.

Spink (1990) reviewed studies in which successful and less successful athletes were differentiated based on their psychological characteristics in gymnastics (Mahoney & Avenier, 1977), wrestling (Gould, Weiss, & Weinberg, 1981; Highlen & Bennett, 1979), and racquetball (Meyers, Schleser, Cooke, & Cuvillier, 1979). Gymnasts competing at different levels were distinguished on the basis of two psychological factors, that is, psychological recovery and self-confidence. Once again, we can see that self-confidence is a significant factor associated with elite athletic performance.

In a study following that of Bota (1993), Durand-Bush, Salmela, and Green-Demers (in press) also identified certain mental skills that significantly differentiated between elite and competitive athletes. The Ottawa Mental Skills Assessment Tool (OMSAT-3*) was used to collect the data because it measured a broad range of mental

skills and attributes that were shown to be important for improving performance in sport. This questionnaire comprised the following 12 scales: goal-setting, self-confidence, commitment, stress reactions, fear control, relaxation, activation, imagery, mental practice, focusing, refocusing, and competition planning. The OMSAT-3* was administered to 335 athletes from 35 different sports who were categorized in either an elite group or competitive group based on their level of competition. Results indicated that the elite athletes scored significantly higher than their competitive counterparts on the commitment, self-confidence, stress reactions, focusing, and refocusing scales. A confirmatory factor analysis indicated that the instrument is an acceptable psychometric tool (Durand-Bush et al., in press).

In a related study, Stevenson (1999) administered the OMSAT-3* to 249 male and female athletes categorized in either a provincial or development group, in an attempt to determine if there were any gender differences. No significant gender differences were found, which suggests that both male and female athletes had acquired similar levels of mental skills. On the other hand, results showed that provincial level athletes scored significantly higher than developing athletes on the goal-setting, commitment, competition planning, focusing, and refocusing scales. Some of these results were similar to those found in Durand-Bush et al.'s (in press) study, that is, commitment, focusing, and refocusing were significantly discriminating variables between accomplished and less accomplished athletes.

Wilson (1999) assessed the level and use of mental skills of elite and non-elite athletes in the environments of training and competition in an attempt to determine if there were any significant differences. A modified version of the OMSAT-3* was

administered to 158 female synchronized skaters. A multivariate analysis of covariance indicated that as hypothesized, elite synchronized skaters reported using more mental skills in both training and competition than did non-elite synchronized skaters. Furthermore, although mental skills for training and competition were rated as equally important, both groups of athletes used mental skills more in competition than in training. A limitation of this study is that the modified version of the OMSAT-3* was not validated.

In summarizing this section, research has shown that elite athletes possess significantly higher levels of mental skills than less elite athletes. The development and maintenance of psychological skills in sport is obviously important for the evolution of talent. It is noteworthy that commitment and self-confidence have consistently been found to be associated with high-level performance. Several researchers found that expert athletes are extremely confident and dedicated individuals who are willing to do anything to become the best, even if this means sacrificing other important activities for a certain period of their lives (Ericsson et al., 1993; Mahoney et al., 1987; Orlick, 1996; Orlick & Partington, 1988). These variables should be given special attention in future research on sport expertise to determine how they are developed and maintained to maximize performance.

Innate Abilities

Another factor having received much attention among scholars concerned with studying expertise is genetics. It is apparent in the literature that the debate concerning the role of innate abilities in the development of expert performance is still unresolved. Some researchers are at one end of the continuum and endorse the “nature” or “innate

talent” account, whereas others are at the opposite end and advocate the “nurture” or “environmental” account, almost to the exclusion of the former.

There is empirical support for both the “innate talent” and “environmental” accounts. In terms of the former one, various cognitive and physical characteristics were found to be influenced by genetics (Baltes, 1998; Plomin, 1998; Rowe, 1998; Zohar, 1998). One example is height, a variable that largely contributes to the success of athletes in sports such as basketball. Olivier (1980) found that the heritability of stature is approximately 95% when different environments are accounted for and equalized. Furthermore, Lykken (1982) found that monozygotic twins correlated approximately .94 in height, even when considering age and sex, whereas, a correlation of .50 was obtained with dizygotic twins.

Height is only one of several genetically determined characteristics that can contribute to the expertise of athletes. According to C. Bouchard and colleagues (1997), body composition and morphology are also influenced by genetics. These authors revealed that body size and proportion, physique, skeletal lengths and breaths, limb circumferences, and bone mass are in part genetically influenced. Furthermore, there is evidence showing that aerobic capacity, adaptability or responsiveness to training, and the composition of muscle tissue are influenced by heredity (Coward, 1987).

In a recent review of empirical findings related to the genetics of fitness and physical performance, C. Bouchard et al. (1997) raised the viewpoint that the *true* contribution of genetics in human performance is far from being understood. However, with respect to talent in sport, they postulated the following:

First, the elite athlete is probably an individual with a favorable profile in terms of the morphological, physiological, metabolic, motor, perceptual, biomechanical, and personality determinants of the relevant sport. Second, the elite athlete is a highly responsive individual to regular training and practice. (p. 366)

The research of C. Bouchard et al. (1997) suggests that some athletes have an advantage because they are more able to adapt to and benefit from intense training. Also, some athletes possess a higher distribution of slow-twitch muscle fibers that makes them more susceptible to succeed in endurance sports. On the other hand, athletes having a higher percentage of fast-twitch fibers are more likely to excel in sports involving sprinting. According to Simoneau and Bouchard (1995), the distribution of muscle fibers has a heritability (h^2) of approximately 40 to 50%, although it has now been shown that this distribution can be modified with training.

Indeed, characteristics contributing to the development of expertise are partly inherited but they can be modified with extensive practice as well. There is evidence indicating that many human anatomical and physiological characteristics such as the size of heart, the number of capillaries supplying blood to muscles, and as previously mentioned, the metabolic properties of fast and slow twitch muscles, are alterable with intense practice. Other studies have shown that several perceptual, motor, and cognitive abilities can also be developed with practice (Keele & Ivry, 1987; Schlaug, Jäncke, Huang, & Steinmetz, 1995; Takeuchi & Hulse, 1993). Azar (1996) reported that brain studies have shown that repetitive motor sequences can trigger changes in the parts of the

brain that accept sensory information and control motor function. It thus appears that the brain can alter its circuitry and reorganize it as individuals develop advanced motor skills.

Psychological determinants are also influenced by genetics. Plomin, Owen, and McGuffin (1994) reported a heritability of cognitive ability of approximately 50%. Furthermore, Saudino (1997) concluded that 20 to 50% of the variance in personality traits (i.e., impulsivity, aggression, depression, thrill-seeking, neuroticism, extraversion, and shyness) within a population is due to genetic differences. These traits could enhance or inhibit athletic performance depending on the level at which they are expressed and the demands of the sport.

The extent to which personality traits contribute to the development of exceptional performance in sport is becoming clearer. Research conducted in the early 1970s suggested that personality, as assessed by traditional personality tests, was not a significant factor in sport (Martens, 1975; Rushall, 1970). However, contemporary researchers have been studying sport personality using a more interactional approach that is based on both personal and situational factors. They have found that elite athletes, compared to less elite athletes, do in fact possess certain personality-related characteristics and skills that help them in their pursuit of excellence. The most compelling evidence of this was provided by Morgan, O'Connor, Ellickson, and Bradley (1988) who demonstrated that successful athletes exhibit an iceberg profile (i.e., high vigor, and low tension, depression, anger, fatigue, and confusion) that is indicative of positive mental health. Even though personality traits appear to play a role in the development of expertise, many questions still remain regarding their heritability. More

research needs to be conducted in this area to clarify their genetic and environmental influence.

Although numerous studies demonstrated the heritability of certain human attributes, Ericsson and Lehmann (1996) stated that “the influence of innate, domain-specific basic capacities (talent) on expert performance is small, possibly even negligible” (p. 281). Ericsson et al. (1993) did, however, admit that:

Several “personality” factors, such as individual differences in activity levels and emotionality may differentially predispose individuals toward deliberate practice as well as allow these individuals to sustain very high levels of it for extended periods. (p. 393)

These authors thus acknowledged that it is possible for early signs of natural ability to be the cause for engaging in training in early childhood but that consequently, characteristics having long been assumed to be a result of innate talent are the result of effortful practice.

Howe, Davidson, and Sloboda (1998) also believe that innate talent does not exist. They stated in their article that “Innate talents are, we think, a fiction, not a fact” (p. 437). They argued that if innate talent does exist, there should be early indicators that enable experts to detect it before exceptional levels of mature performance are manifested. They also postulated that talent should serve as a basis to predict who is likely to excel. However, research has shown that talent detection is very complex and often irrelevant because the performance of early identified individuals cannot be accurately predicted (Bartmus, Neumann, & de Marées, 1987; B. S. Bloom, 1985; Durand-Bush & Salmela, in press; Willimczik, 1986).

The fact that it is difficult to accurately detect and predict talent does not mean that innate abilities do not exist. Howe and colleagues (1998) disagreed with this. They reported that early superior performance is not the result of innate differences but rather differences in training, motivation, and self-confidence. Furthermore, they stated that “early ability is not evidence of talent unless it emerges in the absence of special opportunities to learn” (p. 402). This seems like a strict and even unrealistic observation to make. Csikszentmihalyi (1998) argued that talent cannot develop without opportunities to learn. It can, on the other hand, manifest itself in some children’s ability to learn more, given equal opportunities to do so. According to Csikszentmihalyi, a more plausible explanation is that children may have a neurological composition that makes them more sensitive to sounds, for example, which would motivate them to pay more attention to auditory cues and stimulation, be self-confident in listening and singing, and likely to seek training in music. The same could be said about children having innate sensitivities to light or kinesthetic movement.

In sum, it is disconcerting that after decades of debate, the academic community is still questioning whether or not talent is genetically determined. Many would argue that the question is irrelevant because every characteristic of the human body is influenced to some degree by genetic predispositions as well as by gene and environment interactions. However, as long as it is not proven through the isolation of specific genes, researchers like Ericsson et al. (1993) and Howe and colleagues (1998) will continue to advocate that innate talent is essentially non-existent and does not contribute to the development of expert performance. More research must be pursued in this area to clarify the nature-nurture controversy.

To summarize the literature review, it has become apparent that whether or not individuals become experts in a domain depends on many factors. Several studies were paramount in demonstrating the importance of external factors such as parental support, coaching, and training. Other researchers highlighted the importance of more internal factors such as psychological skills and personal traits. The conceptual framework that framed the design of this study will be addressed next.

Conceptual Framework

As it was seen in this chapter, important findings regarding the development of expertise have been generated in the literature thus far. Some of these findings helped to frame the current study. The study of Bloom (1985), more specifically, the stages of talent development he proposed, along with the role of coaches and parents at each stage contributed to the design and questions that were asked in the current study. Côté, Salmela, Trudel et al.'s (1995) coaching model was also significant because it depicted components relevant to the coaching process and the development of elite athletes. It was hypothesized that these components that pertained to training, competition, organization, and the context and personal characteristics of coaches and athletes would be relevant in the lives of expert athletes because they work with coaches on a regular basis. Other notable studies that generated important findings regarding training (Ericsson et al., 1993), enjoyment and motivation (Csikszentmihalyi et al., 1993), psychological skills and attributes (Orlick & Partington, 1988) and innate abilities (C. Bouchard et al., 1987) influenced the factors that were examined in this study.

Côté and Hay's (in press) research was also pivotal in the current investigation however it only came into play at the analysis stage because it was at that point that it

was written and made available to certain researchers. As previously mentioned, Côté and Hay postulated a sport-specific model that outlined children's stages of participation in sport, a model that extended Bloom's (1985) stages of talent development. This model was relevant because the athletes in the current study were asked to discuss various phases of their athletic career and these resembled those described by Côté and Hay. Following are the rationale and purpose of the current study.

Rationale of the Study

Despite the significant empirical findings that have been generated across domains up to date, there is still a need to expand the knowledge base regarding the development of expertise in sport. Several theoretical and methodological gaps were identified in the studies reviewed. For example, Ericsson et al.'s (1993) framework must be further tested in the domain of sport. Their observations that innate talent is negligible in the development of expertise and that effortful training activities are not enjoyable are questionable and require more investigation. Côté and Hay's (in press) model, which outlines children's stages of participation in sport and the role of families at each level, was an important contribution to the literature but it was developed based on only a few studies. It should be further examined in future research with athletes competing in different sports and at various levels, including the highest levels in sport. Moreover, some researchers have examined the role of parents, coaches, and teachers in the development of expertise (Bloom 1985; Csikszentmihalyi et al., 1993; Salmela, 1996) but more sport-specific research in this area is warranted.

Very few researchers have looked at the entire career development of outstanding athletes and aimed to simultaneously examine a wide variety of factors. Relatively no

research has focused on the maintenance of performance in sport and it would be beneficial to athletes to be aware of what experts do to stay at the top once they become the best in their sport. Orlick and Partington's research with Olympic athletes was instrumental, however, these authors did not look at their complete development. They only focused on psychological factors that contributed to their performance when they were competing at a high level.

Other scholars have attempted to study how certain factors such as mental skills, age, recovery, and innate abilities improve athletic performance, however, like in most studies, there were limitations in the quantitative or qualitative designs they used. Some studies involved the use of questionnaires of which the validity and reliability was questionable. Other findings were only based on retrospective data that were not corroborated by additional sources. In one particular study, Csikszentmihalyi and colleagues (1993) attempted to examine the lives of talented teenagers using an innovative method, however, it appeared to have certain flaws and limitations. For one, the ESM method was only carried out over a period of one week and the form the participants filled out was not particularly exhaustive. The validity of this method was not addressed and discussed. These methodological gaps raise questions regarding the trustworthiness of some of the findings discussed in the literature and suggest that more research be conducted to further examine certain factors that were identified.

It is clear that more studies should be carried out in the domain of sport with highly accomplished athletes and their parents and coaches because their wisdom and knowledge has not been frequently tapped in the literature. There is also a need to concurrently examine an array of factors perceived to be important for both the

development and maintenance of expert performance. It was mentioned in the literature that research in the domain of sport should focus on examining the authentic experiences of athletes rather than their ability to perform isolated tasks in laboratory settings in an attempt to capture the essence, complexity, and interaction of factors that influence sport performance. These gaps and recommendations have led to the design of the current study.

Purpose of the Study

The purpose of this study was to investigate factors perceived to be important in the development and maintenance of expert performance in sport. Specific research questions that guided the inquiry were: a) What factors contribute to the development of the highest level of performance in sport? b) What factors contribute to the maintenance of the highest level of performance in sport for an extended period of time? To answer these questions, the perceptions of Olympic and World champion athletes and their parents and coaches were examined. The viewpoints of the parents and coaches were important because they complemented those of the athletes and through triangulation, they also served to increase the trustworthiness of the study (Huberman & Miles, 1994).

The methodology in this study was designed to examine a variety of factors having contributed to the personal experiences of the participants. In-depth and open-ended interviews were conducted to allow the participants to share as much information as possible regarding the development of expert performance from the early childhood years to the late years when highest levels of performance were maintained. Aside from interviews, concept mapping was another method that was used to collect data. It provided an innovative means to triangulate the information elicited from the athletes and

to authenticate the analysis of the data as well. More details concerning the methodology and procedures utilized in this study are discussed in the next chapter.

CHAPTER III

METHODOLOGY

This chapter presents the research paradigm that was used to guide the current inquiry. It also provides detailed information concerning the interview guide, participants, procedures, and methods that were used to collect and analyze the data. The first section focuses on the research paradigm.

Research Paradigm

Various paradigms can be used to conduct research. The paradigm that guided this study was chosen based on the proposed research questions (Nelson, Treichler, & Grossberg, 1992). The task of choosing an appropriate paradigm was somewhat challenging because no clear boundaries exist between them. Guba and Lincoln (1994) summarized the ontological, epistemological, and methodological premises of the positivist, postpositivist, and constructivist paradigms (see Appendix B). A thorough review of these paradigms suggested that the postpositivist one would be most appropriate to answer the research questions of this inquiry.

Miles and Huberman (1994) are proponents of the postpositivist paradigm and they justified their position by stating:

We think that social phenomena exist not only in the mind but also in the objective world and that some lawful and reasonably stable relationships are to be found among them. The lawfulness comes from the regularities and sequences that link together phenomena. From these patterns we can derive constructs that underlie individual and social life. (p.4)

They believe that it is difficult in the actual conducting of research to fix oneself in one place along a continuum between relativism and postpositivism and that in many cases, researchers situate themselves closer to the center and use multiple approaches that overlap. They also made the observation that “no study conforms exactly to a standard methodology; each one calls for the researcher to bend the methodology to the peculiarities of the setting” (p. 5).

The postpositivist paradigm was chosen to guide this study because it advocates subjecting reality to the widest possible objective examination in order to apprehend it as closely as possible. It also acknowledges the fact that it can never be perfectly understood. Furthermore, this paradigm considers that although researchers and participants are more or less dependent entities that influence each other to a certain extent during an inquiry, it is important to remain objective by comparing findings to pre-existing knowledge and subjecting them to a review by peers and referees. The postpositivist paradigm encourages the collection of data in more natural settings, as well as the use of both quantitative and qualitative methods of analysis to provide the most accurate picture possible of the phenomenon under study. More explicit reasons for selecting the postpositivist paradigm to guide the current investigation are outlined in Appendix C.

Interview Guide

One of the reasons the postpositivist paradigm was chosen to guide this investigation was because it allows researchers to work with a conceptual framework and to discuss their findings in light of preexisting knowledge. Significant findings concerning the development of expertise have been reported in the literature and some of

these findings guided the design of this study. Bloom's (1985) stages of talent development were used to develop the interview guides for the athletes, parents, and coaches. More specifically, the open-ended questions were framed to cover the athletic career of the athletes and thus to account for their early, middle, and late years of development. Côté, Salmela, Trudel et al.'s (1995) coaching model was also used to develop the interview guides. Questions regarding the training, competition, organization, context, and personal characteristics of the athletes were included.

The research of Ericsson et al. (1993), Csikszentmihalyi et al. (1993), and Orlick and Partington (1988) also influenced the factors that were examined in this study. Although the questions in the interview guides remained open-ended, specific probe questions were planned to address the participants' views regarding effortful practice, enjoyment, innate abilities, coaches/teachers, parents, peak performances, recovery, and mental skills and preparation. The interview guide used with the athletes (see Appendix D) was essentially identical to that used with the parents and coaches (see Appendix E).

It was mentioned earlier that the research of Côté and Hay (in press) was influential in the current study however it was not considered in the design of the interview guides because it had not been published at the time. Côté and Hay's research only came into play at the analysis stage. Details pertaining to the contribution of their research to the analysis of the results of this study are provided in a subsequent section.

Participants

The sample for this study included 10 Olympic and World champions having reached and demonstrated consistent high level performance (see Table 1). The number of participants was chosen based on time and resource constraints associated with

sampling experts. More specifically, six women and four men participated in the study. They were aged between 19 and 36 years. To alleviate some of the challenges inherent in accessing expert participants, athletes from both team and individual sports were solicited. There were three team sport athletes and seven individual sport athletes. A total of seven different sports were represented. Finally, because current elite level athletes are often inaccessible due to their demanding schedules, retired athletes were also asked to participate. Consequently, four participants in this study were retired from sport but had the same prestigious status as the six current participating athletes. All but one of the retired athletes had stopped competing within the last three years.

Table 1

Demographic Information Pertaining to Athletes

Athlete R=retired C=current	Gender	Date of birth	Age	Country	Sport	Achievements
C1	F	70-12-23	27	Canada	Speed skating (long track)	• Gold – 500m, 1000m, Silver 1500m '98 World Cup • Set world record in 500m, 1000m, and 1500m races in '98 • Gold – 500m, Bronze 1000m '98 Olympics • Gold – '99 World Cup
C2	F	71-06-26	26	Canada	Wrestling	• Gold – '94, '96, '97, and '98 World Championships (68KG) • International Wrestler of the Year '97 • Gold – '97 and '98 Pan American Wrestling Championships • Winner of 6 consecutive Canadian Senior Championships • Canadian Female Wrestler of the Year '93-'97
C3	M	70-07-02	27	USA	Hurdles (400m)	• Gold – '89 Pan-Am Juniors • Gold – '91 and '93 World University Games • Gold – '94 Goodwill Games • Gold – '95 World Championships • Gold – '96 Olympics

Table 1 (continued)

Athlete R=retired C=current	Gender	Date of birth	Age	Country	Sport	Achievements
C4	F	78-08-12	19	Canada	Hockey	• Gold – '94, '97, and '99 World Championships • Silver – '98 Olympics • Gold – '95 and '96 Pacific Rim Championships • Gold – '96 Three Nations Cup, Silver in '97
C5	M	72-08-24	25	Canada	Freestyle Skiing (moguls)	• Gold – '94 Olympics • Gold – '93 World Championships • Silver – '95 World Championships • Gold – '97 World Championships • 1992-93, 1995-96 and 1996-97 Grand Prix Mogul Champion • Gold – '99 World Cup
C6	F	70-11-15	27	Canada	Hockey	• Gold – '94 and '97 World Championships • Silver – '98 Olympics • Gold – '95 Pacific Rim Championships • Gold – '96 Three Nations Cup, Silver in '97 • Gold – '92 Roller Hockey World Championships • First female to play men's CIAU hockey with the University of New Brunswick Reds in 1994-95 and 1995-96
R1	F	64-12-11	33	Canada	Synchronized swimming	• Silver – solo event '84 Olympics • Gold – solo event '88 Olympics • Gold – duet event '88 Olympics • Gold – solo and duet '85 FINA World Cup • Gold – solo and duet '86 World Championships • Gold – solo and duet '87 FINA World Cup
R2	M	61-08-02	36	Switzerland	Bobsleigh	• Gold – 2man, Bronze – 4man '92 Olympics • Gold – 2man, Silver – 4man '94 Olympics • Gold – 2man '90 and '92 World Championships • Gold – 4 man '89, '90, and '93 World Championships

Table 1 (*continued*)

Athlete R=retired C=current	Gender	Date of birth	Age	Country	Sport	Achievements
R3	M	70-02-06	27	USA	Swimming	• Gold – 4x100m medley relay '92 Olympics • Silver – 100m backstroke '92 Olympics • Gold – 4X100m medley relay '96 Olympics • Gold – 100m backstroke '96 Olympics • Current world record-holder in 100m backstroke (53.86 sec.) • Seven-time U.S. Champion
R4	F	65-05-12	32	Canada	Hockey	• Gold – '90, '92, '94, and '97 World Championships • Silver – '98 Olympics, team captain • Gold – '95 and '96 Pacific Rim Championships • Gold – '96 Three Nations Cup, Silver in '97 (team captain)

Note. Age = age at time of interview.

Huberman and Miles (1994) reported that qualitative researchers should not be driven by a concern for “representativeness” when selecting participants. On the contrary, they raised the importance of conceptually thinking about sampling and carefully choosing participants who will be suitable for the investigation of the phenomenon of interest. All participants in this study were purposively sampled, that is, they were intentionally chosen based on relevant criteria in mind. Since the purpose was to obtain information about expert athletes, *unique* and *reputational* case sampling was employed. This means that participants were selected based on their unique and outstanding accomplishments, and also based on the recommendations of informants in the field (Patton, 1987).

Reliable and competent informants such as sport researchers, practitioners, and administrators were sought to identify athletes having won at least two gold medals at separate Olympics or World Championships. Examples of informants were sport psychology consultants who worked with elite athletes or with some of their colleagues, administrators of sport governing bodies who had tracked records of the athletes' performances, and researchers in the athletic field who had access to elite athletes.

As a result of the lack of research on the perceptions of parents and coaches regarding the development of expert performance, a parent or coach of each athlete was also solicited to provide his/her personal views on this topic (see Table 2). In instances where a parent was not available or forthcoming, a coach who had significantly contributed to the athlete's career was asked to participate. In this case, the athlete was asked to provide the name of a coach who met this criterion of involvement. In two instances, both a parent and coach were interviewed because they were available and offered to participate. In one case, both the mother and father were interviewed at the same time. In total, five mothers, four fathers, one female coach, and three male coaches participated in the study.

Table 2

Demographic Information Pertaining to Parents and Coaches

Athlete	Parents	Coaches
C1		CC1 • Male coach for '97-98 season
C2	PC2 • Mother	CC2 • Male coach since '93 • Also athlete's partner

Table 2 (*continued*)

Athlete	Parents	Coaches
C3	PC3 • Father • Also coached C3 from '77-'88	
C4	PC4 • Father • Also coached C4 from '85-'91	
C5	PC5a • a = father; b = mother PC5b	
C6	PC6 • Father • Also coached C6 from '77 - '84	
R1	PR1 • Mother	CR1 • Female coach from '82 - '88
R2		CR2 • Male coach from '86 - '94
R3	PR3 • Mother	
R4	PR4 • Mother	

Note. A telephone interview was conducted with CR2. This coach was German and spoke a little bit of Parisian French. As the interviewer, I had difficulty understanding him even if I am fluent in French and it was practically impossible to subsequently transcribe the interview. Consequently, no citations were included from this coach in the final thesis. The parents of R2 only spoke German and were not available for an interview.

The data gathered from the parents and coaches were used to complement and triangulate the information elicited from the athletes (Denzin, 1978; Huberman & Miles, 1994). It was not an objective of this study to impose value judgments on any of the

participants' perceptions but rather to respect these and examine similarities and discrepancies so that the most salient information could be extracted to provide a thorough account of the development of the athletes' expertise.

Data Collection and Analysis

Now that the participants have been described, the focus of the chapter will shift to the methods and steps that were undertaken to collect and analyze the data from the athletes, parents, and coaches. Details regarding gaining entry, researcher preparation, interviews, concept mapping, and procedures to enhance trustworthiness will be provided. Note that the 1st person will be used in the following text to provide more flow to the discussion.

Gaining Entry

I originally anticipated that gaining access to the competitive milieu of World and Olympic champions would pose some challenges (Eklund, 1993). While the process was tedious, I was fortunate to recruit the participants through personal contacts such as coaches, athletes, sport psychology consultants, friends, and acquaintances who knew the athletes on a more personal basis. After briefly talking to the athletes about the study, these contact persons provided me with the necessary information to contact them. In person or through e-mail or the telephone, I explained the purpose and potential benefits of the study, as well as specific details for their involvement. The athletes were also given a letter of information (Appendix F). It is noteworthy that all of the athletes I approached agreed to participate in the study.

In sum, I believe that the main reasons the athletes were forthcoming was because I had a connection to their setting or I was introduced to them by a person they respected.

Moreover, I provided them with a brief and straightforward explanation of the investigation. I also had prior knowledge of their competitive milieu and strong interpersonal and communication skills. Finally, I was courteous and respected their priorities and time constraints (Eklund, 1993).

Researcher Preparation

Before collecting data from the participants, one of my responsibilities as the interviewer was to develop adequate competencies and skills to interview experts. Dexter (1970) stated that the more the respondents are elite, the more important it is that the interviewer be as fully informed about them as possible. Consequently, I did some research to familiarize myself with the participants' background and sport context, and to get acquainted with the nature and terminology of their sport before hearing their reports. More specifically, I did searches on the internet, read newspaper clippings, and talked to informed individuals within their respective sports. This enabled me to approach the interviews feeling prepared, confident, and having enough knowledge to generate meaningful discussions.

Pilot Project

From a postpositivist standpoint, it is imperative that certain measures be taken throughout an inquiry to ensure its trustworthiness (Huberman & Miles, 1994). Having conducted a pilot project and invested time to prepare for the data collection certainly added to the credibility of this study. As part of my preparation, I interviewed five elite athletes using an interview guide that was developed based on gaps and findings in the literature (see earlier section). Note that these athletes did not subsequently participate in the study. I felt very comfortable with the process of gaining the athletes' trust, following

their lead, and probing for valuable information. I was able to remain focused throughout the interviews as the information they shared was extremely fascinating and unique. The interviews lasted between one to three hours, which was sufficient time to get a meaningful picture of the evolution of their successful careers.

This pilot project was an excellent opportunity to refine my interviewing skills as well as the questions designed to elicit the participants' perceptions. Overall, the general open-ended questions (see interview guides in Appendices C and D) remained the same. However, I was able to fine-tune more specific probe questions that I asked throughout the interviews. I realized that I had to be very flexible and ready to adapt my questions based on the information the participants provided. For example, one athlete talked at great length about his training schedule and activities while another did not. Consequently, I had to use more probing questions related to training with the latter participant.

In terms of the concept mapping activity, I also went through the process with an athlete to refine the procedure. I learned that it was a tedious task that required considerable time and concentration on both our parts. I was glad to have done the pilot exercise because it enabled me to refine the steps involved in the activity and the order in which they were undertaken (see description of these steps in latter part of the chapter). For example, I asked the athlete to sort the index cards before rating them. However, I realized that it was best to rate them first because it saved a lot of time. Also, I did not provide the athlete with the five broader categories and he found it very time consuming to go through the entire process of sorting and conceptualizing 165 index cards. He said that it would be beneficial to have some initial structure to expedite the process.

Consequently, I gave the three participants who did the concept mapping activity the opportunity to use the broader categories in order to facilitate their task and respect their time constraints.

Interviews

Once all the preparatory steps were undertaken, the data collection process began. Interviews were the main strategy for collecting data from the participants. The purpose of the interviews was twofold: a) to elicit the participants' perceptions of factors involved in the development and maintenance of expert performance and b) to verify, revise, or extend information obtained from other participants or sources such as biographies and internet reports (e.g., triangulation) as well as interpretations developed through other forms of analysis, such as member checking (Bogdan & Biklen, 1992; Huberman & Miles, 1994).

The interviews were in-depth, open-ended, and semi-structured; semi-structured in the sense that general questions were devised to guide the interviews (see Appendix D for the athletes' interview guide and Appendix E for the parents' and coaches' interview guide). All of the athletes were interviewed prior to their parents or coaches. The interviews with the athletes lasted between 1.5 and 3.5 hours whereas those with the parents and coaches lasted between 40 minutes and 2 hours.

Interview Steps

The first step involved scheduling interviews with each athlete and a corresponding parent or coach. All meetings were arranged in advance because in most cases, I had to travel to various cities in Canada and the United States. All the interviews with the athletes were conducted face to face. On the other hand, 9 of the 13 interviews

with the coaches and parents were conducted over the telephone because I was not able to travel to where they lived to do it in person.

At the onset of each interview, the participants were reminded of the nature and purpose of the inquiry and asked to sign a consent form conforming to established ethical research guidelines (see Appendix G). For the parents and coaches who did a telephone interview, a consent form was faxed to them and returned to me with their signature before the interview. I sought the permission from all the participants (i.e., athletes, coaches, and parents) to tape-record the interview. Based on Spradley's (1979) suggestions, I began the interviews by asking more broad, general questions to give the participants the opportunity to get acquainted with the process and to speak in a relaxed atmosphere. As the interviews evolved and salient information emerged, I used probes or direct cues to follow up promising leads or to return to earlier points that required further development.

The interviews were terminated when they ceased to be productive, that is, when the information was redundant and/or the participants and I had nothing more to say. At this point, I asked them for their address and explained that I would be mailing them their interview transcript for verification. I also asked if I could telephone or e-mail them if I had to clarify certain points after the transcription of the interviews. The participants were thanked for their cooperation and sent a formal acknowledgment letter.

After the interviews were conducted, they were transcribed verbatim. The only changes that were made to the transcripts were spelling corrections and grammatical changes that improved the flow of the text. Before proceeding to the analysis stage, I sent a copy of the interview transcripts to all of the participants to authenticate that the

information accurately reflected their perceptions. They were asked to provide their written comments directly on the transcripts and to mail them back to me at their earliest convenience in the included pre-stamped, addressed envelope. I made appropriate revisions upon return of their transcripts. This process of member checking was an important step for establishing credibility (Miles & Huberman, 1994).

Analysis of Interview Transcripts

The analysis of the interview transcripts did not formerly begin until all of the interviews were conducted, transcribed, and verified. However, some level of analysis did occur as the interviews were transcribed and cleaned up for verification. I could not help but notice emerging categories as I read through the transcripts several times before sending them for authentication. Note that the steps involved in the analysis of the athletes' interview transcripts were not exactly the same as those used to analyze the parents' and coaches' transcripts. The steps included in the analysis of the athletes' transcripts will be discussed first.

Athletes' Interview Transcripts

The data elicited from the athletes were analyzed using both inductive and deductive processes of reasoning, an approach endorsed by proponents of the postpositivist paradigm (Miles & Huberman, 1994). Côté, Salmela, Baria, and Russell's (1993) procedures for analyzing qualitative data were adapted and used in this study. The analysis consisted of four main steps: a) preparing the data, b) creating meaning units, d) importing the data into NUDIST 4.0, and d) creating and conceptualizing categories. These steps are described in detail below.

a) Preparing the Data

This step involved reading the interview transcripts several times to get acquainted with the data. Note that as I read the text, I jotted down directly on the hard copy of the transcripts obvious categories that reflected the content (i.e., individual preparation for competition). This step was inductive and facilitated my subsequent work in NUDIST 4.0. At this stage, spelling corrections and grammatical changes were made for clarification and the transcripts were also updated on the computer based on the participants' comments after authentication.

b) Creating Meaning Units

Once the transcripts were edited, I divided the text into "meaning units," or separate pieces of text containing one idea, concept, or piece of information that could be interpreted on its own. This was done directly on the computer in the Microsoft Word text file I created for each interview. Following is an example of a meaning unit that pertained to parental guidance.

Her mother played more of a directional role. She gave her the skills to manage her life so she could do what she wanted which was to do well in school and play hockey. (PC6)

More inductive analysis of the data occurred at this level as well because as I read the transcripts to create the meaning units, additional categories emerged and I noted them down as I progressed. The more I read the transcripts, the more the data "spoke to me."

c) Importing the Data into NUDIST 4.0

This step involved importing the data (i.e., meaning units) from Microsoft Word text files into the computer program NUDIST 4.0 (Non-theoretical Unstructured Data Indexing, Searching, and Theorizing, 1998). This software program was used to facilitate the process of managing a large amount of unstructured qualitative data. More specifically, it was utilized to categorize and conceptualize the athletes' interview transcripts. It is important to note that this program is non-interpretive in nature thus it did not interpret or make sense out of the data; it only helped me to code, modify, search, and retrieve the data.

d) Creating and Conceptualizing Categories

Once the meaning units were imported into NUDIST 4.0, the next step consisted of coding them under categories that were either inductively or deductively created. Note that a considerable part of the analysis had already been inductively performed at this stage. For example, it became evident as the text was broken down into meaning units in the previous step that the athletes progressed through different stages throughout their career.

Côté and Hay's (in press) article came out at this phase of the analysis. The stages of sport participation they described resembled those in the current study. Thus, it was logical to code the meaning units based on their stages rather than creating new stages or using new terms to label them. Consequently, three broad categories entitled Sampling Years, Specializing Years, and Investment Years were deductively created based on Côté and Hay's model to group the meaning units that pertained to these stages. I also inductively created a fourth broad category entitled "Maintenance Years" to group the

information that concerned the period after which the athletes became World and Olympic champions. Definitions of these stages can be found in Appendix H.

In my initial inductive analysis of the transcripts in steps a) and b), I also observed that most of the meaning units pertained to either the athletes' context, personal characteristics, training, or competition. Thus at this level, I deductively created four sub-categories entitled Context, Personal Characteristics, Training, and Competition based on Côté, Salmela, Trudel et al.'s (1995) coaching model that I grouped under each of the broad categories Sampling, Specializing, Investment, and Maintenance Years.

The remaining part of the analysis was inductive. After creating the aforementioned four broad categories and four sub-categories, I went through each meaning unit of every interview transcript and inductively created sub-categories that specifically captured the essence of the topic being discussed within the meaning units and I then coded the meaning units under these categories. Meaning units that contained similar information were coded within the same category. If there was no category that accurately reflected the content of a particular meaning unit, a new one was created.

Meaning units were coded at more than one category. For example, the following meaning unit was coded under "Sampling Years," "Personal characteristics," "Innate abilities," and "Work ethic." The two latter categories were a sub-category of Personal characteristics, which was in turn a sub-category of Sampling Years.

As a kid growing up, I was always very athletic, like sports came quite naturally to me. I was always the first one picked on school sport teams and stuff like that. I had certain records in elementary school, like for the flexed arm hang, those kinds of things. But I worked very hard at it. For

example, in high school when I was doing some sports, I wasn't any better than anyone else, I was just average, while in elementary school, I think I was above average than other kids. I think it was more my work ethic. I've always been a really hard worker with what I do. (R1)

Based on Tesch's (1990) recommendations, the analytical process was flexible so that categories could be modified and refined until a satisfactory list was established and exhausted from all of the athletes' interviews.

Once all the meaning units were coded, all of the categories and meaning units that were coded under them were printed. One appealing feature of NUDIST 4.0 is that the meaning units are clearly organized on the print-outs. The program produced a statistical summary at the end of each print-out indicating the total number and percentage of meaning units retrieved, as well as the number of documents/interviews from which retrievals were made. These elaborate print-outs were used to write the results of the study and select the most significant citations.

Parents' and Coaches' Interview Transcripts

The interview transcripts of the parents and coaches were only analyzed after I finished analyzing all of the athletes' transcripts. The purpose of the analysis of the data from these participants was to check for similarities and differences in order to triangulate and complement the data provided from the athletes.

The first two steps of the analysis were the same as those involved in the analysis of the athletes' interview transcripts. I first read the parents' and coaches' transcripts several times to get acquainted with the data and I then divided the text into meaning units. Note that the meaning units were divided up directly on the hard copies of the

authenticated transcripts and not in a computer file like I did with the athletes' transcripts. This was because I did not use NUDIST 4.0 to analyze the data from the parents and coaches because the analysis was not as in depth with these participants.

I used a more deductive approach to create the categories, that is, I created them based on those that were identified in the analysis of the athletes' interviews. I wrote down the categories directly on the hard copies of the transcripts and highlighted meaningful citations that could be included in the Results section. For example, the following meaning unit was categorized as "Sampling Years, Personal Characteristics, Innate Abilities."

Physically, she's very strong so she's pretty naturally gifted that way.

She's also naturally gifted technically, so those are two big pluses when you start here instead of down there. (CC1)

It is noteworthy that all of the meaning units from the parents and coaches' interview transcripts fit into the existing categories that were derived from the analysis of the athletes' transcripts.

Concept Mapping

In addition to the interviews, concept mapping was another complementary method that was used to elicit information from the athletes. Concept mapping is a fairly recent but well-accepted research method that allows participants to articulate ideas, assign meaning to those ideas, and represent the results in the form of a physical map (Tesch, 1990; Trochim, 1989). In other words, it enables participants to conceptualize ideas in a written and visual fashion. This method is very appealing because it combines both qualitative and quantitative analysis strategies and actively involves the participants

in the construction and analysis of the data. Concept mapping has never been empirically used to collect data in studies on expertise. Consequently, it was an innovative and exploratory component of this study. The data elicited from the concept maps were used to complement the rest of the data provided by the athletes.

According to Rizzo Michelin (1997), the process of concept mapping can be delimited to three phases: preparation, construction, and interpretation: a) preparation includes processes that precede the actual construction of maps such as brainstorming, sorting, ordering, prioritizing, and rating activities; b) construction comprises the events occurring during the actual development of conceptual maps; and c) interpretation encompasses the analysis and exploration of the maps.

Rizzo Michelin (1997) reported that researchers may use various adaptations of the concept mapping process to actualize their research goals. For the purpose of this study, I used a combination of Huberman's (1989) and Miles and Khattri's (1995) concept mapping approaches because they have been shown to be reliable and pertinent to present and link ideas and concepts.

Three of the ten athletes, that is, C2, C4, and R3 participated in the concept mapping activity. The athletes were two current female athletes and one retired male athlete. The activity consisted of developing a conceptual map that represented the factors they perceived important in the development and maintenance of their expert performance. The athletes were contacted ahead of time to schedule this second meeting, which was held approximately a year after their initial interview. They were mainly selected based on availability and convenience but it is noteworthy that they displayed a

remarkable ability to articulate their views and opinions during their initial interview.

Following are the steps that were involved in the concept mapping activity.

Phase a) Preparation

The preparation phase was actualized during the first phase of the study, that is, through the interviews conducted with the ten athletes. All of the ten athletes' perceptions of the phenomenon under study were obtained by asking open-ended questions that were sufficiently focused to elicit their perspective on the phenomenon, yet ambiguous enough not to unduly influence their response. Their responses were qualitatively transformed to a set of representative meaning units that were coded under specific categories.

After having analyzed the interviews conducted with the ten athletes and exhausted all possible categories, statements that reflected each category were printed on small index cards and used in the actual construction of the maps. Appendix I contains the list of 170 cards. Note that the index cards were not numbered for the activity. The numbers were only subsequently added for their discussion in this document.

Phase b) Construction

In the construction phase, I individually met with the three athletes. At the onset of the meeting, I explained to them what I did in the first part of the analysis so that they understood how I arrived at the set of index cards. I then asked them to review a line graph that I generated based on the analysis of their interview transcript (see Appendix J) to verify that all the information was accurate. I debriefed the graph with them to clarify the stages of development and transitions. I had a sheet with a definition of each stage of development (Appendix H) for clarification. If changes had to be made, I made them directly on the line graph.

I then explained the concept mapping activity and asked permission to tape record the rest of the session in case I would have had to go back to the data. Note that it was beyond the scope of this study to transcribe and analyze all of the verbal information the athletes provided during this activity.

After a brief explanation, I gave each athlete the same complete set of cards that I had mixed up randomly. The athletes were told to think aloud throughout the activity. They read each statement out loud, and then rated it on a scale from 1 (not important) to 7 (very important) based on how it contributed / how important it was to the 1) development of their performance, and 2) maintenance of their performance. I showed them on the line graph that the period up to the end of the investment years was to be considered the “development of their performance,” and the period after that, the “maintenance of their performance.” They were asked to justify their ratings in cases where they felt it was relevant to do so. This step provided information about endorsement patterns among the athletes because each was required to rate the same cards / statements (Trochim, 1989).

After rating the statements, the athletes were asked to sort them into similar, meaningful piles on a large piece of bristle board. I told them that they could create as many piles and sub-piles as they desired. I also asked them to think aloud and explain why they put a certain card in a pile. In order to facilitate and expedite the sorting process, they were given five index cards containing broad categories, under which they could start sorting the other 165 cards. These broad categories stemmed from the analysis in the first part of the study and included: Context, Personal Characteristics, Training, Competition, and Organization. I gave them an example to illustrate the meaning of these

categories. I also told them that they did not have to use these categories if they did not want to or that they could change the name if they had a more meaningful one.

If a statement on an index card did not apply to them, they did not have to include it in their map. They were asked to set it aside and I took note of it. An example of a card that was not included in one athlete's map was "I had a full-time job."

After sorting the cards, the athletes labeled each pile with a name or short statement that represented its content, directly on the bristle board. They also indicated how the piles were categorized and linked together by drawing arrows, circles and other shapes. I told them they could write or draw anything on the bristle board to clarify their conceptual map. This particular step of labeling and linking piles of information reflects Huberman's (1989) approach to concept mapping.

It should be noted that the entire process was flexible in that the athletes could place the piles of cards in ways that were most relevant to them. They could move them around or move a particular index card from one pile to another at any time if they wished to do so. The concept mapping activity lasted between 2.5 to 3.5 hours.

Phase c) Interpretation

Ratings

The athletes' ratings for each of the 165 cards were analyzed to determine which factors were particularly important in the development and maintenance years. More specifically, the index cards were examined to see if certain factors were more important in the development years than in the maintenance years, and vice versa. To this end, a difference score was calculated for each index card based on the ratings provided by each athlete for the "development of performance" and "maintenance of performance." For

example, if for a particular statement an athlete circled a 3 for “development of performance” and a 7 for “maintenance of performance,” a difference score of +4 was noted. Conversely, if an athlete circled a 6 for “development of performance” and a 4 for “maintenance of performance,” a difference score of -2 was recorded. If an athlete circled a 5 for both, then a null score of 0 was noted to indicate that there was no difference between his or her ratings for that particular statement. Following this, the frequency of the difference scores (i.e., +1, -1, +2, -2 and so on), as well as the frequency of the null score of 0 was calculated for each athlete. Difference scores exceeding four digits or more were highlighted and discussed in the Results section.

Maps

In terms of the actual maps, each one was individually examined and subsequently compared to the others to identify similarities and differences. I had anticipated converging the three maps into a holistic one following Huberman’s (1989) approach, however, because there were only three of them and they were unique in many ways, I opted to provide a summary and diagram of each map instead. A summary of major similarities and differences across the three maps was also generated.

In sum, concept mapping was an interesting, exploratory strategy used to collect additional data from the athletes. It was an excellent method used to triangulate the data and to verify the accuracy of the analysis that was performed during the first phase of the study. Additional procedures that were used to increase the trustworthiness of this study are discussed next.

Procedures Used to Enhance Trustworthiness

Several criteria have been outlined in the literature to verify the findings and conclusions derived in qualitative studies. The criteria generally advocated for assessing the quality of postpositivist inquiries include: a) internal validity, that is, the degree to which findings and interpretations correctly map the phenomenon in question; b) external validity, which is the degree to which findings can be generalized to other settings similar to the one in which the study occurred; c) reliability, that is, the extent to which findings are consistent and stable over time and can be replicated or reproduced by another researcher; and d) objectivity, which is the extent to which the findings are determined by the participants and the conditions of an inquiry rather than by the biases of the researcher (Miles & Huberman, 1994). Following are procedures that were used to meet these criteria.

a) Internal Validity

Thick description

Miles and Huberman (1994) compiled an impressive list of tactics and questions that researchers should consider when drawing and verifying the conclusions of qualitative inquiries. With respect to internal validity, they reported that researchers can increase it by providing context-rich and meaningful “thick” descriptions of their findings. Considerable time was invested into reading the interview transcripts and analyzing and presenting the results of this study. As it will be seen in the following chapter, a thick description of the findings was provided and several citations were included to illustrate the findings of this study.

Triangulation of Data from Various Sources

Triangulation is another procedure that can be used to increase the internal validity of a study (Miles & Huberman, 1994). The data elicited from the interviews with the athletes, parents, and coaches, and from the concept mapping activity with three of the athletes were triangulated and verified for accuracy. In most instances, the data corresponded between the participants. In cases where it did not, the participants were asked for clarification during their interview. It was advantageous that all parents and coaches were interviewed after the athletes because the athletes' perceptions could be verified by their parents and coaches when they did not match their own. For example, one athlete had revealed that she had started swimming at the age of 10 while her mother said that she had started at age 8. I told the mother what her daughter had reported and she said that she was in fact mistaken and that her daughter was right.

Documents / Reports

Another strategy used to increase the internal validity of this study involved gathering documents about the athletes, such as newspaper clippings and reports on the internet, prior to and during the inquiry (Miles & Huberman, 1994). These documents and reports were used to prepare for the interviews and also served as benchmarks against which certain information (i.e., events the athletes attended and number of medals they won) could be tested for adequacy.

Peer Debriefing

According to Miles and Huberman (1994), the validity of an inquiry can also be increased by subjecting findings and interpretations to the evaluation of peers. A research team served to help carry out internal checks on the rigor of the current study. This team

consisted of Master's and Ph.D. students, as well as professors who were conducting research in the field of sport expertise and who thus had an in-depth understanding of the area of inquiry and the methodological issues involved. Debriefing meetings occurred on average twice a month. During these sessions, I discussed with my peers several issues related to the design, analysis, and interpretation of the results and this served to check my own understanding of these issues and to enhance my ability to articulate the findings of the study. For example, after the pilot study at the design stage, I discussed with my peer group the benefits and drawbacks of giving the athletes the five broad conceptual index cards at the start of the concept mapping activity. Based on the results of the pilot exercise, the consensus among the peer group was to give the athletes the opportunity to use the index cards if they wanted to. The use of Côté and Hay's (in press) stages to frame the analysis of the data was another issue that was debated with the peer group and they confirmed my observation that it was a representative and logical way to structure the data.

Member checking

Member checking was another procedure that was used to increase the internal validity of the results (Miles & Huberman, 1994). As previously mentioned, all of the interview transcripts were sent to the participants for verification after they were transcribed and corrected for grammar and spelling. Upon their return, I made the changes they suggested which were minimal. The participants mainly corrected the spelling of names and added a few words or sentences to clarify an idea they were discussing.

b) External Validity

External validity is another criterion that was addressed in this study. According to Miles and Huberman (1994), the possibilities for transferring the findings of a study depend on the similarity between the context of the researcher and that of the reader. These authors suggested that one way the external validity of a study can be increased is by providing thorough descriptions of the participants, settings, and processes involved in carrying out the study to permit adequate comparisons with other samples and studies. They also suggested providing a “thick description” of the results to allow readers to assess the potential and appropriateness of generalizing the results to their own settings.

Consequently, I provided extensive information regarding the sample, procedures, and steps that were involved in conducting the current study and I also thoroughly described the results to enable readers to judge whether or not the findings could be generalized to their own context. The results were discussed in light of the time and context in which they were found to hold, however it is difficult at this point to accurately predict if they would hold in another context or even in the same context at some other time. It was not a purpose of this study to make predictions or to generalize the findings to the rest of the population because after all, there were only 10 athletes interviewed in this inquiry. The fact that 12 parents and coaches corroborated the athletes’ reports increases the internal validity and the generalizability of the results to similar contexts. Nonetheless, more research needs to be conducted to assess whether or not the current findings can be generalized to the rest of the population of expert athletes.

Maxwell (1992) suggested that theoretical validity can also be a measure of external validity. Theoretical validity is the extent to which the findings or interpretations

of a study can be linked to theoretical constructs beyond the immediate study. This study appears to have considerable theoretical validity because it confirmed several findings in the literature. It lent support to Côté and Hay's (in press) model of participation in sport. It also validated most of the components of Côté, Salmela, Trudel et al.'s (1995) coaching model. In this respect, it could be concluded that this study has considerable external validity.

c) Reliability

Miles and Huberman (1994) reported that questions researchers should ask themselves in assessing the reliability of a study include: Are the research questions clear and are the features of the study design congruent with them? Are basic paradigms and analytic constructs clearly specified? Were data quality checks made for bias, deceit, and informant knowledgeability? Were any forms of peer review in place? Do findings show meaningful parallelism across data sources? The answer to these questions is "yes." The research questions were clearly identified and the design and paradigm used in the study were congruent with them. As previously mentioned, a peer group was in place and debriefing sessions served to reduce researcher bias and to ensure quality control. Overall, the data that were elicited from the athletes concurred with those provided by the parents and coaches. Furthermore, the data collected during the concept mapping activity corresponded to the information the athletes provided during their interview.

d) Objectivity

Procedures undertaken to remain objective in this study involved keeping a clear and organized trail of records that outline the process by which the data were collected and interpreted (Miles & Huberman, 1994). Miles and Huberman's suggested checklist for

storing, retrieving, and retaining data was used to minimize bias and to ensure that the findings, interpretations, and conclusions of this study were supported by the data. This checklist can be found in Appendix K. Researcher bias was also controlled through the peer debriefing sessions. Members of the peer group helped me to remain objective as we debated and discussed various aspects of the study, including the analyses and interpretations of the data. The concept mapping activity provided an additional opportunity to control researcher bias because the participants were asked to verify the data and interpretations before starting the activity.

Summary

In sum, the postpositivist paradigm was used to guide the current study. The research questions were developed based on a pre-determined conceptual framework and were answered using a combination of two methods: in-depth, open-ended, and semi-structured interviews and concept mapping. These data collection methods generated extensive and comprehensive data regarding the expertise phenomenon in sport. Several procedures were undertaken to increase the internal and external validity, objectivity, and reliability of this study. Results of the current inquiry are discussed in the following chapter.

CHAPTER IV

RESULTS

The data in this study were collected in two phases: Phase 1 - Interviews with the athletes, parents, and coaches; and Phase 2 - Concept mapping with 3 of the 10 athletes. The results from Phase 1 are presented first, followed by those from Phase 2. Furthermore, the results from Phase 1 are presented based on the stages of development that were identified, that is, the Sampling, Specializing, Investment, and Maintenance Years. Within each of these stages, the results elicited from the athletes are presented before those obtained from the parents and coaches.

1. Phase 1 – Interviews

The purpose of the interviews was to elicit the participants' perceptions regarding the development and maintenance of expert athletic performance. Several factors were raised and varied across the different stages of development. These factors were described under specific headings along with supporting citations. Note that there was a large number of meaning units (MUs) in the database and thus the most appropriate meaningful ones were chosen to illustrate the categories that emerged. An attempt was made to include citations from each participant.

The following results emerged from the analysis of the athletes' interview transcripts. The number of MUs derived from each interview is provided in Table 3. Note that these numbers do not necessarily reflect the quality of the interviews. The difference between them can mainly be attributed to the open-ended nature of the interviews, in which boundaries were not imposed on the topics discussed. The fact that some interviews lasted longer was not necessarily an indication of a greater knowledge base or

a higher level of experience on the athletes' part. Some athletes simply had more time or more to relate during their interview.

Table 3

Total Number of Meaning Units (MUs) Per Interview with Athletes

Athlete	Number of MUs
C1	63
C2	84
C3	52
C4	83
C5	208
C6	126
R1	70
R2	217
R3	71
R4	120
Total	1094

1.1. Overview of Athletes' Career Trajectory

A graphical overview of the results that emerged from the athletes' interviews can be found in Appendix J. As each interview was analyzed, a line graph was created to depict important events or markers in the athletes' careers, as well as transitions between different stages of their development. The different stages through which the athletes progressed were evident and the transitions between them were usually qualified by a

significant event such as changing clubs, working with a new coach, entering high school, moving to another city to train, making the national team, or winning a gold medal. These transitions will be illustrated with specific citations in subsequent sections.

The average number of years spent within each stage and the average age at which the athletes progressed to a new stage were compiled and presented in the following table.

Table 4

Number of Years Spent Within Each Stage and Age of Entry in Another Stage

Athlete	Stages of Development						
	Sampling Years (no. of years)	Transition (age)	Specializing Years (no. of years)	Transition (age)	Investment Years (no. of years)	Transition (age)	Maintaining Years (no. of years)
C1	10	10	7	17	9	26	1
C2	20	20	2	22	3	25	2
C3	15	15	3	18	7	25	3
C4	11	11	4	15	2	17	2
C5	15	15	3	18	3	21	4
C6	19	19	5	24	3	27	1
R1	14	14	3	17	3	20	3
R2	21	21	3	24	4	28	5
R3	9	9	6	15	5	20	6
R4	21	21	3	24	4	28	4
Mean	15.5	15.5	3.9	19.4	4.3	23.7	3.1

1.2. Sampling Years

The sampling years were characterized by a period in which the athletes engaged in various sports, games, and physical activities mainly for their pleasurable and social aspects. Through their involvement, they also aimed at developing fundamental personal characteristics and physical attributes. The first part of this section will focus on the athletes' perceptions regarding the sampling years and will be followed by those of their parents and coaches.

1.2.1. Athletes

Several categories of information pertaining to the sampling years emerged from the athletes' interview transcripts. More specifically, these categories concerned the athletes' context and personal characteristics, as well as training and competition. Following are the results related to the context of the athletes.

1.2.1.1. Context

The broader category of context involves factors in the immediate environment of the athletes that can affect their performance, for example, human resources such as family, coaches, teammates, and other athletes, physical and educational resources, and also factors related to the structure and orientation of their sport.

1.2.1.1.1. Family

During the sampling years, the family of the athletes played a crucial role in their development. Most of the athletes' parents were athletic and encouraged their children to participate in various sports including the sports in which they were personally involved.

Both my parents are quite athletic and they were always involved in sports and heavily involved in various fitness clubs that we belonged to. So we

obviously got into sports because they were into sports. They enrolled us in various sports and just always backed us up. Whatever I wanted to do they always said, "Sure." And I just took a natural love for sports. (R1)

I think my mother was the biggest influence in my life. I was always very physically active as a child, and she played a lot of sports so I always wanted to play everything I could. Then when I asked her, "Will you take me to the rink?" She said, "Sure!" At that time, a lot of mothers would have said, "No, girls don't play hockey," because that was back in the early 70's and there were no other girls playing in my area. But she played softball, hockey, and broomball and I grew up going to her sport activities. It was cool. (R4)

My parents were both heavily involved in hockey before I even started minor hockey. My dad had coached some of the boys' teams and they were both teachers so they knew all the kids and we were always at the rink. My dad used to play senior hockey and we would go and watch them at night and I never really wanted to leave the rink. So I think it was just something that I started to watch at a young age and got hooked on and never really had a desire to do anything else. Hockey in the winter and then ball in the summer and that is what everybody kind of did. (C4)

The parents were very supportive of their children's participation in sport. In many cases, they were responsible for introducing their children to the sport in which they became experts. They also got involved in the organization of the sport to coach or manage teams, for example. For three of the athletes who got engaged in a male

dominated sport like hockey, it was crucial that they receive all the support they could get from their parents because it was not a common practice for girls to get involved in this sport when they were young.

I would probably have to say that my mom and dad were the most influential when I was young. They were the ones who asked me if I wanted to play and then they were supportive of me. I know that a lot of girls at that age, their parents might not have even wanted them to play. It wasn't necessarily me bugging them to play hockey. I just remember them asking me if I wanted to play. So, just knowing that that support was there I think was good. Then after the first season when they saw that I liked it, getting involved in coaching I think was something that was nice to see, taking the interest to do something like that. (C6)

I would say that my mom and dad influenced me the most. I think I have been really fortunate in that they have given me the opportunity to play because as a young girl from a small town in Saskatchewan, I was in a pretty red neck situation. A girl on a boys' team was not the best thing to do when you were growing up but my parents were always there to support me. Whenever people would criticize, they were right there and always agreed with my decisions. And when I said I wanted to play hockey they never second guessed it at all. They put me right in. (C4)

I remember skating when I was probably four or five on an outdoor rink in my community but then we played hockey, it was just a family kind of thing. I guess when I was eight, I asked my mom if I could go sign up for

hockey with the rest of the guys. In my community where I lived, I was the only girl my age so I hung out with them. They were all going to play so she said, "Sure." She took me out to the outdoor rink and I signed up and started playing. (R4)

One athlete mentioned that his parents were supportive but they did not get involved in the sports in which he participated. They didn't go out and play with their children like many other parents did because they had too many other commitments.

My father was an entrepreneur. He supported gymnastics but he was not active. They never came to see me, even in the bobsled days. They weren't too interested. My mother was afraid when I told her that I wanted to go bobsledding. She said "Oh! think about it again." My father said, "Ok, if you want to do it, do it." They supported me, not actively, but they let me do it. When I was a kid, they had too much to do. I cannot talk too much about my parents. They have not been role models. They did not go out with me to do things. Never. (R2)

Aside from the support most athletes received from their parents, some athletes mentioned that they were grateful that their parents were not pushy and did not put pressure on them to excel at a young age. They felt it was important that their parents emphasized fun.

I think the fact that my parents let us try everything but didn't push us to stay with anything if we didn't enjoy it helped a lot. That's probably the key, trying different things and enjoying them. (C1)

At the beginning, when we would get back from competitions, it was not, in fact, it was never, "What was your result?" It was, "Did you have fun?" We never felt any pressure. We never felt like we had to perform for our parents. Our parents were never in front of us nor behind, they were always at our side. And this has been an extraordinary learning experience. It was extraordinary to not feel any pressure. (C5)

The athletes talked about not only their parents but also their siblings. It was interesting to note how many of the brothers and sisters were involved in the same sports when they were young. Some of them were responsible for getting the athletes initially involved in their chosen sport.

I actually started playing ringette but my sister had seen a poster for speed skating so I just decided to give it a try. She was really enjoying it. We did the same thing for about six or seven years. I'm the youngest so she was my middle sister. My oldest sister had tried it but never enjoyed it. She tried it for a year and that was it. (C1)

My sister started acrobatic skiing a year before me and said, "You know, you are good in moguls, so why don't you try too?" So I said, "Ok." I took a risk and won the race in my category. When you win a race at 14 years old, it motivates you to continue. So that's how I started. It was my sister who introduced me to this sport. (C5)

I played road hockey all the time with my big brother and everybody. We played constantly in the winter time. (R4)

For some athletes, their older sisters and brothers were excellent role models in the early years of their career. They learned tremendously by observing their siblings as they played games and engaged in various physical activities.

I was the youngest of four children. I had a brother five years older and he was very very talented. My oldest sister, seven years older, was on the Swiss national team in track and field. When we were young, we would play the whole weekend, throwing stones over our house. I was three and I always had to watch my sister and brother doing such things and I tried too, that's normal. I couldn't reach their level because they were older than me but I tried and tried and tried. I was around them and I imitated and just learned from them. So when I was three years old, it was very positive for me to have the role models that I had. My parents would say, "Go on with your brother and sister." (R2)

I would say that my older sister was a role model for me when I was younger because she was female athlete of the year when she was in high school. She was someone I looked up to and I wanted to work hard to try to strive to be as good as her. But, it never happened and that was fine by me. I was a pretty good athlete in high school but when I started out I wasn't. I worked hard and then became a pretty decent athlete. I did the best I could. So, I wasn't like my sister who was the top athlete but she was my role model. (C2)

The home town in which the athletes grew up seemed to have a positive influence in their life. The following citations illustrate the significance some athletes attached to growing up in a small community.

I think the environment I grew up in was very helpful for me to fulfill my needs or my dreams because I grew up outside of big cities, in a very small village with two and a half thousand people. Sport in that village was very very well known because a lot of people had been successful at the national or some of them at an international level, and there were very good people who supported that. I think that the atmosphere in that village was very good because I was supported to try to become good. (R2)

I grew up on a farm. My parents were outside working all the time so we were kind of left on our own, building forts and playing in the bails and just going to the dug outs, swimming, and making rafts and just doing those sorts of things. We did a lot of physical activity when we were younger, just playing games, but it was nothing organized. We lived a half an hour from the nearest town so we were way out in the bush. (C2)

We lived in a small town in Saskatchewan and there were about 2000 people there. So basically the only thing to do was to play hockey. So my dad built a rink in our backyard when I was five and that's where I kind of got started.

1.2.1.1.2. Coaches

In addition to parents and siblings, coaches played a crucial role in the sampling years. They were a significant resource on which the athletes relied for support and fun.

I actually knew my first coach more because he was from our neighborhood and one of his daughters was my age. Like my parents, he was supportive and free with kids because he made it fun as well. I think that that was the key in speed skating. The first coaches I had there were fun. So even at an early age, the thing that comes back to my mind is fun. (C1)

My coach at the time was just a real easy going, fun guy. He was my phys. ed. teacher as well. I liked phys. ed. a lot and I liked him being my coach too. He put no pressure on us at all and we just had a lot of fun. (C2)

At five years old, I had a summer league coach who didn't necessarily know a lot about swimming but he knew how to fill up time in the water. I don't remember what I was learning or what type of practices we were doing, or what my coaches were teaching me as far as priorities. I was just there enjoying it. (R3)

It is interesting to note that three of the athletes reported that their father coached them when they were young. According to them, the fact that their father was quite knowledgeable about the sport had a significant impact on their career.

My dad coached my brother and I, and he coaches my sister right now. He coached us right up until I was 12, until we moved from Shaunavon. So basically, I started at a young age and got some good coaching at a young age, which makes a huge difference in my hockey career now because he really knows the game and was able to teach me the fundamentals at a

young age. He taught me how to deal with the fact that I wasn't going to be accepted in every situation. (C4)

My dad used to run track when he was in college. He was a hurdler and he was my coach when I was 7. He was my coach all the way through high school so he was very influential in starting my career in track and field. He encouraged my sister and I to run track. (C3)

At the start of my second year [7 years old], my dad started coaching my house league team and my mom was the manager so they were both really supportive. Softball was my summer sport and they got involved in coaching that as well. Obviously with my dad being my coach, he tried to make sure I didn't get any special treatment, being too easy on me, but at the same time, I think he was always good at not being too hard on me either, just because I was his daughter. I never really had any trouble with any of the other kids on the team in terms of that. (C6)

At this level, it was more important for coaches to encourage children and to provide them with opportunities to have fun and experience success. According to the following athletes, knowing that their coach cared about them made a difference in their life.

I give my minor hockey coaches credit for making the game fun and giving me confidence and encouraging me to keep going just for the love of the game. That would probably be the role that they played, not doing anything that would force me to dislike the sport would probably be how I'd describe their role. (C6)

My first coach was great because my mom took me down there and he said, "Awesome! A girl on the team." He was all excited so it was great. I went and played and he was always very supportive and actually we would go away to tournaments and he would be bragging that he had a girl on the team so it was kind of funny. He took the time with all of us. He cared a lot about hockey and about kids. (R4)

One athlete mentioned that although his coach made training fun, he still emphasized quality at a very young age, which contributed to his development of skills. Fortunately, the coach made an effort to balance work and fun.

I remember this guy who led our gymnastics group. He was 50 and he was such a structured man. He wanted to have these little people moving perfectly, not very complicated movements, but high quality and we had to do that at six or seven years old. He could create this atmosphere of getting us to be very in control but he did not make it too boring that we would quit. So we always had that balance. We knew that we had to do one hour of very boring training but then we had an hour of vivid playing. (R2)

For two of the athletes, it appears that the coaches they had in the beginning had an impact in that they detected that they had potential in the sport in which they became exceptional. Perhaps this was also the case for the other athletes, however, they did not discuss it.

As a six year old, you don't have a lot of coordination but I've seen some six year olds who you could obviously tell there was a difference between

them and the ones next to them. They just had a feel for the water. It's like some kids are smarter than others, or can run faster. I don't know that it was obvious to me but my coaches could see it. (R3)

Obviously, the coaches must have had a bit of confidence in me when the other goalie decided that she didn't want to play anymore. They didn't have any hesitation in using me in those situations, even though it was only my first year as a goalie. And our other goalie had been playing two or three years at that point, so obviously they must have felt I could do it even though I hadn't been playing it for too long. (C6)

For one of the athletes, it was a lifeguard rather than a coach who noticed that she had potential in synchronized swimming.

A local lifeguard saw me floating and doing some basic sculling motions and she said that I should try out for the synchro team. So I said, "Sure" and I actually learned how to swim through synchro. (R1)

The aforementioned athlete also reported that her first coach was instrumental in her development because she made training not only fun but continuously challenging. She instilled confidence in her.

The key element to my success early on was the fact that it was fun. My first coach, and I still keep in touch with her, always made the classes a lot of fun. She always praised me for what I did and she made me very enthusiastic about it. She was always, "Wow, that was really good, let me see you do that again!" Her enthusiasm rubbed off on me but she always challenged me. She said, "Do you think you can do this? I don't think you

can do that, do you think you can do that?" I just said, "Ok, sure!" Any kid loves a challenge, so she challenged me and I met the challenge. But I think the key element was because it was fun, it was never boring, and that's what kind of propelled me. (R1)

It is evident that parents and coaches had a positive influence on the athletes during their early childhood. They created environments in which the athletes were challenged, praised, and had fun while developing fundamental skills that would be extremely useful later in their career. Other individuals who had an impact in this type of context were friends and other athletes.

1.2.1.1.3. Friends

It is noteworthy that 7 of the 10 athletes discussed how friends were an important resource when they were young.

Being around my friends was probably the most fun because they were on the track team and every Saturday we competed and that was a lot of fun. (C3)

I started swimming on a team when I was five and I started partly because I liked swimming, but also because a lot of my friends did it and I thought it would be fun. (R3)

I would wrestle my friends, like my girlfriend in junior high. One time, I remember she got excited because she actually got me down. She was telling her family that I was really tough so she got me to wrestle her big sister. It was really just for fun. (C2)

It was important to some of the athletes to have friends not only within their sport but also outside of their sport because this provided variety and balance.

I had friends in all the sports I did but my closest friends were never into sports. I've always sort of had a variety of people around me and it seems that the people closest to me often aren't in sports. Maybe because it gives me variety. (C1)

1.2.1.1.4. Other athletes

Even in the earliest years, other athletes were an important resource to many of the athletes in this study. The following citations illustrate how other athletes had an impact in their lives.

When I was 13 years old, the summer Olympics were in Montreal. I remember going to see an event and thinking, "This is awesome, this is so cool, seeing these athletes from all over the place." I guess what struck me more was this girl who was 14 years old and she was the youngest swimmer on Canada's Olympic team. She ended up winning the bronze medal in breaststroke and she was a member of the same pool as me and I knew her quite well. I remember going to our pool one day and she was wearing a Canada track suit from the Olympics. I was just blown away and thinking, "Wow! That's what I want to do. I want to have a Canada jacket." I wasn't thinking about the Olympics so much, I was thinking that I wanted to represent my country. I wanted a Canada jacket. (R1)

What I think I learned in the early years was to observe others just to learn from them. I learned from older and more advanced athletes,

observing exactly what they were doing and why they were doing things. Then I tried things out and assessed if it was good for me. I think people learn only by copying people. They can only copy someone who really has something to offer. So you have to go to the people who have something to offer, especially as a kid, because you're in a low development stage. But also then, you should have people who are really advanced in their thinking and development. (R2)

My friends and I used to videotape World Cup competitions and repeatedly watched the mogul runs. We knew all of the movements and turns by heart. That really sunk in my head. As a result of constantly observing other athletes and their movements, it became natural for me. I could really apply the movements after that without having a coach or anything like that. (C5)

Aside from human resources, other factors that were important in the sampling years pertained to the orientation and structure of the environment in which the athletes played sports and games. Topics such as the age at which the athletes began organized sports, early successful experiences, playing a variety of sports, and dropping out of sports will be discussed next.

1.2.1.1.5. Starting Age

The environment in which the athletes grew up influenced the age at which they were initiated to sports and physical activity, as well as the age at which they began organized sports, including their sport of highest achievement. Once again, the athletes'

parents played an important role. They engaged in sports and games with their children when they were as young as three years of age.

I first got thrown in the water as a kid at two years old in the local pools. I can remember swimming with floaties but always really just loving the water. The other thing is I grew up with my parents having a boat, so I was always on the boat, in the water, learning how to ski. So at a really young age, I was really comfortable with the water. (R3)

I learned to skate on an outdoor pond where I lived. I remember my mom and dad would pack the car and take me there. I guess my earliest memory would be, "Skate to me" and then they would keep backing up so I never got there. We would also go public skating the odd time on really cold days and I remember just asking for a pair of hockey skates. I was probably only five. (C6)

One athlete was a late maturer and was not able to engage in just any type of physical activity like other children normally did. Nevertheless, he did eventually get involved in sports.

At three years of age, I was very slow because my legs were late developing and I had underdeveloped muscles in my legs and I could not do the things that other kids were doing. My mother was worried about me because my legs were not developing the way they should and I remember when I was five years old, I was one of the slowest in my peer group. Then when I was seven and started running track, and like I said I was not one

of the best athletes, I was at the back of the pack. I started coming around later in life. (C3)

In terms of organized sports, the age at which the athletes got involved varied between 5 and 12, with an average age of 7.3. The following citations were included to relay the athletes' perceptions regarding their introduction to organized sport.

I started running when I was seven years old. I was on a neighborhood track team and I ran sprints like the 50 and 100 yard dash. I think that the fact that I was very young when I started had a lot to do with my success because I think that athletes who want to reach the Olympic level should start very young. All athletes who are in the Olympics did not start when they were seven years old but I think that it's somewhat important. (C3)

The first season I was able to play organized hockey, I was six years old. I was really lucky because there was a four team Atom girls house league from ages 6 to 10 so I just went right into that. I think there were only two of us who were six years old on our team and we were really the youngest of the group playing in the four year range but that didn't really bother me. I had a lot of fun. (C6)

The following table summarizes the age at which the athletes were introduced to organized sports and the sport in which they eventually excelled.

Table 5

Age of Introduction to Organized Sports and Sport of Excellence

Athlete	Age	
	Organized Sports	Sport of Excellence
C1	7	10
C2	12	20*
C3	7	12*
C4	6	6*
C5	7	7*
C6	6	6*
R1	10	10
R2	5	21
R3	5	5*
R4	8	8*
Average	7.3	10.5

Note. * These athletes starting playing or practicing their sport of excellence for fun at an earlier age. For example, R3 was swimming with floaties at the age of 2. C4, C6, and R4 were playing hockey on the ice and on the road with friends by age 5. C5 started skiing at age 7 but he did not have a coach until he was 15 years old. He did however participate in other organized sports like gymnastics at age 7. C2 wrestled with her siblings and friends

all of her life. C3 was running in track and field competitions for fun before he started running hurdles.

1.2.1.1.6. Early Success

Most of the athletes experienced early success in sports and this seemed to have motivated them to remain involved. Note in the following citations how success and enjoyment appeared to be interrelated.

When I got into synchro, I really enjoyed it. I caught onto it really fast and I improved at a pretty quick rate and obviously when you're good at something, you want to keep going, and going, and going to see how much better you're going to become. (R1)

Between 7 and 15 years of age, I skied on the mogul runs for the fun of it. I had no intentions of competing. I enjoyed it so I always tried to improve and stretch my limits. This is why when I started competing, it went really well because I already had these abilities to push my limits and the desire to work hard and do well. (C5)

I just really had a natural ability to skate and I liked to play so I would spend hours on the outdoor rink, shooting pucks, practicing and playing hockey. So I think that my greatest asset was the fact that I really loved to play and so I just practiced. It was not really even practice it was just doing what I liked to do so it made a difference. (C4)

In order to expand on the issue of success, the athletes were asked about the moment when they knew they were good. One athlete replied:

I think I was probably always pretty aware of it, as aware as a six year-old can be. I would say I first came to realize it when I was nine years old. That's when I first really started coming out of my shell and started competing at a national level. You could compare my times to the people around the country and by the time I was 12, I was breaking national records, which meant that I was the fastest 12-year-old in the country at that point. So I knew that I had potential if I continued and didn't burn down and those types of things. But I also knew that it was something I enjoyed doing. I really just always loved swimming. (R3)

One athlete revealed that she did not excel in sports when she was young, however, this never stopped her from practicing and from enjoying herself.

I remember not being the best athlete. I would work hard at it, but I wasn't one who excelled in elementary school. But I enjoyed playing sports and I was pretty competitive. I had a pretty laid back attitude. I worked hard and tried to win, but I didn't really care about the results so much, especially back then. It was just recess sports. (C2)

1.2.1.1.7. Variety

Experiencing enjoyment and early success obviously inspired the athletes to reach new heights, however, participating in a variety of sports was another factor that motivated them to remain engaged in that domain. All of the athletes discussed their involvement in several sports as well as other activities such as ballet and piano during their childhood.

Really, there was never a point in my life when I was just doing one thing. I had variety and I think that my activities complemented each other. I don't think it's good if a kid becomes too serious about something. (C1)

As a kid, I was enrolled in ballet and T-ball, things like that. My parents tried to enroll me in various things and they just always backed me up. I just took a natural love for sports. I loved track, gymnastics, volleyball, and football. So as a kid, I really liked sports. (R1)

I did a lot of other things as a kid. I played every sport that I could play up to when I was about 14 in eighth grade, right before I got into high school. I played basketball, football, baseball, and ran track. I've played the guitar and the piano, probably in an effort to see if there was anything else that I enjoyed as much as swimming. But a lot of it was also because my friends were doing those things and I wanted to be part of it. (R3)

I played hockey in the winter and then softball in the summer and in high school, I played field hockey too. I guess you could say that I liked baseball but I loved hockey. Intrinsically, it was more fun. (C6)

Two of the athletes revealed how the sport of gymnastics had a positive influence on the development of their skills.

I did gymnastics, which gave me an extraordinary base. If ever I have kids someday, I would like them to do gymnastics, not necessarily to perform at a high level, but to give them good dexterity, flexibility, and coordination skills. After that, they could do whatever they want. But for me, this base

always helped me in my career in an extraordinary way. It helped me become a natural athlete. (C5)

When I was five years old, I started to do gymnastics but when I was 14, I quit because I was too tall. In that same club, there was also track and field and basketball and then I just changed to different sports. But I think this gymnastic background helped me very much to learn how to move properly. (R2)

1.2.1.1.8. Drop out

Regardless of the success, variety, and support the athletes received during the sampling years, two of them temporarily dropped out of sport toward the end of this period. Reasons given included too much emphasis on competition, diverging interests, and lack of human resources. The following citation illustrates how one athlete quit sports because of the pressure involved and also because he wanted to engage in different activities.

I quit sports for three years between 13 to 16 because there was just too much competition during these youth years. I'm not really aware why but my focus turned to something else, to technical things like a motorbike. I was very interested in technique, motors, and things like that. I had too many interests! (R2)

For another athlete, dropping out of her sport was not what she wanted to do but she didn't have a choice because there came a time when she could not continue playing with her team.

I played minor hockey until probably age 14 in the boys' minor hockey league and then I stopped playing altogether until I was about 19 because there was nowhere for me to play at that point. The boys in midget were getting a lot bigger than I was so I stopped. (R4)

As can be seen from the citations in this section, the context in which the athletes were immersed during their childhood affected how they initially developed as both individuals and athletes. In sum, it was important that they receive support and encouragement from their family and coaches, and that they were given the freedom to participate in a variety of sports to experience fun and success with teammates and friends. It is noteworthy that most athletes began organized sports at a fairly young age, the average being 7.3 years. They however participated in less formal and structured sports and games as early as two and three years of age. All these factors most likely had an impact on the personal characteristics they developed. The athletes' personal characteristics in the sampling years will be the focus of the next section.

1.2.1.2. Personal Characteristics

The athletes discussed certain traits and abilities they possessed during their childhood and these were categorized as personal characteristics. More specifically, the categories were: physical characteristics, mental characteristics / personality traits, and innate abilities.

1.2.1.2.1. Physical Characteristics

Only three athletes talked about physical characteristics. Athletes C2 and C3 revealed that they were late maturers and therefore had to work hard to experience success in sports compared to their peers. Another athlete, R2, reported that he enjoyed

gymnastics but eventually had to drop out due to injuries and a lack of success after having grown too tall. He found it awkward to go through this growth spurt.

I was hanging there at the bar and touching the ground with my feet. The others were laughing because I couldn't do it anymore. I was too slow and too tall. My muscles were not growing at the same speed as my bones and I was just like a little ape. I couldn't move like I was able to when I was nine years old. I lost all my abilities because my body was changing so fast. (R2)

1.2.1.2.2. Mental Characteristics / Personality Traits

The athletes discussed not only physical but also mental characteristics. Some of them talked about being motivated and setting goals. Certain aspects of their personality appeared to have influenced them to pursue their objectives during the early stages of their career.

Being stubborn helps too because I never really took no for an answer. I always wanted to prove myself on the ice in those years between 6 and 16, which were really challenging both on and off the ice in hockey. I think that's something I've carried with me my entire life. (C4)

In grade 10, they only had one volleyball team. I was close but didn't quite make it. I was a bit smaller than everyone else, I was a late bloomer. I got cut, but I was OK with that. I got my mom to buy me a volleyball and net, so I practiced at home all the time. My older sister was a good volleyball player, but she wouldn't play with me because I wasn't good enough. So, I'd just practice on my own against the house, or I'd throw the ball up and

then I would run and try to spike it myself. So I was pretty motivated to try hard and then I did make the team in grade 11 and 12 and we had a lot of good experiences. (C2)

It can be seen that even in the sampling years, the athletes implicitly set goals and had a lot of perseverance to accomplish them. The following citations further demonstrate some of the goals the athletes established and achieved, even in the face of obstacles.

When I first started, my best friend played two seasons and then she didn't want to do it anymore. So I stuck with it and was the only female even when I was trying out for midget. I think that realizing what you want helps you too. I knew that I wanted to play hockey and I didn't really care with whom or how. So when people told me I could not play or there should not be any girls on the boys' team, I just put it aside and kept playing. (C4)

I probably got the Olympic seed planted even as far back as '82. In the Canadian Hockey magazine, there was an article on the women's game and someone from the female council was cited as saying, "They will hopefully be in the Olympics by the year 2000." So my 12 year old wisdom said that NHL players played until they were 30 and that's how old I would be. I said, "I could play until I'm that old." So, it was always there in the back of my mind but they had only had one National Championship in '82. It all seemed so far away and I was probably being a little bit naïve. Everyone kept saying to me, "You could go to the Olympics in field

hockey." But, I said, "Hockey is going to be in the Olympics too." And they sort of laughed at me. Here we are 14 years later and we got there. It was always one of my goals to get there. (C6)

Five of the athletes discussed the work ethic they had when they were young, which explains their level of commitment and the time and effort they invested into various sports during those years.

I realized that you have to actually work hard if you want to achieve your goals. You just don't get things handed to you. A lot of that came from my grandfather who had been a merchant marine during World War II until he retired. He never graduated from high school but ended up becoming chief engineer on the ships that he was on, just through self-education and reading. By the time I got to know him he was retired. He retired probably the year I was born. I got to know him from that point, contending to work hard. (R3)

I remember the swim coach I had. When we had lengths to do, she'd say, "You're the only one who does the workout like I put it down. Everyone else cheats. Everyone else will do fewer lengths than what's up there." I asked her, "Why? I mean this is the workout." I was the one always winning the races and she said, "Well, that's why you're winning because you're the one who does everything. The rest of them cheat and slack off. They don't go as hard as they could and you always do." So I think I learned very young that it pays off. I always wanted to do the best that I could, whatever I did. I remember playing softball too and I mean I wasn't

a great softball player or anything. I was playing on this really competitive team and I was in the outfield. But most people like to play the infield because that's where the action is. I told myself, "I'm in the outfield and I'm going to be the best center fielder there is." I took it as a challenge to be the best that I could. Whatever I'm given, whatever I do, it's always a challenge to be the best I can. (R4)

The athletes were asked about the time when they knew they were special in sports and had potential to become a great athlete. Following are two of the athletes' responses. One athlete believed he was not more special than others while another said she knew based on the feedback she received.

I never knew that, I think. I don't think that I am special in sports. Perhaps, one little difference when it comes to bobsleigh is that the difference between ranking one and five or one and three is, you really have to think about the reproduction of something very very complicated, and that was what I really could do best in that field. When I could do something once, if I really concentrated on that, I could always do it twice, three times, four times. That I think was the difference because I was not always very good in training, when I trained with others. But I could really put it together for competitions and do it four times, no mistakes. I was able to do it when it counted. (R2)

I guess when I played with the guys. They would tell me. Stats wise, I would always get good comments about how I played so I knew that I was a good player. (R4)

1.2.1.2.3. Innate Abilities

In addition to physical and mental characteristics, the athletes communicated their views on the topic of innate versus acquired abilities. In fact, they were asked specific questions related to this topic during their interview. Their responses were fascinating. Eight of the 10 athletes admitted that although they worked hard throughout their life to develop the physical and mental skills required to reach the highest level in their sport, they believed they were born with some innate abilities that helped them at one point or another in their career. A citation from each of the athletes was included to relay their perceptions regarding this intriguing topic.

The only thing I was born with that gave me an advantage over others is my body type in that my bone mass is very small. I have very very small bones and that makes me very buoyant in the water. We would do buoyancy tests and I always beat everybody with flying colors because I have such a light frame. They measured my bone mass and it was 2% less than that of the average female. I would say that that was a real benefit to me because I didn't have to work quite as hard as other people in the water because I could float. Therefore, I could be higher in the water and the higher you are, the better marks you get. That was something that I was certainly born with. But as a kid growing up, I was always very athletic. Sports came quite naturally to me. But I also worked very hard at it, I think it was more my work ethic. I've always been a really hard worker in what I do. (R1)

I think I had a good natural ability for wrestling, a kinesthetic awareness. I understood how to get people down, how to keep them there and keep my balance. It was a sport I was introduced to at age 20, but it was something that I picked up quite well. I think my dad had natural talent as a wrestler, that type of grappling ability, but he never had the chance to see what he could do with it. [DO YOU THINK YOU GOT THAT NATURAL ABILITY FROM YOUR FATHER?] Well, I never saw my dad wrestling. He's 45 years older than me. So just from what I heard, stories that my mom and other people would say, he was really good. Also, my mom is pretty tough. I arm wrestled her a couple of years ago and I thought for sure I'd beat her. I was a really good wrestler then and I had been weight training a lot and she beat me. I was really surprised. That's because she and my dad worked on the farm and they have worked hard all their life, carrying chop pails, chucking bails. I didn't have to do that but my mom and dad had to. So I think maybe I got good genes from them.

(C2)

After gymnastics, I went on in what I was gifted, like sprinting, track and field, and 400m hurdles, just going for what I liked to do and trained for that. Those things came easy to me. (R2)

I really believe that each of us has some gift or talent or something we do better, at least better than anything else that we do. Probably most of us have a gift that we do better than the other 90% of the population, it's just a matter of finding it. Fortunately I found mine really early. Technically,

as far as swimming is concerned, I just had a really good feel for the water. Swimming is a technical sport. It's not a sport where you just get in and try as hard as you can. The difference between something like swimming and running is that there is a lot of resistance, a lot of drag in swimming. The faster you go, the more drag you create or the more resistance you feel against the water. So it's really important that as you go faster, you be more streamlined. You can see some people swim, not only they do not have a good feel for the water, but they just get in the way of the water. I had really good strokes that way. I was really fortunate.

(R3)

The following athlete is the only one who discussed her religious faith and attributed a great part of it to her success, along with natural talent.

Being a Christian athlete, I believe I had a gift. For sure I think that everybody has something that they are special in, and it's theirs to develop. Mine is speed skating. There will be a reason for me to do well and I'm going with it. I am sure a lot of people agree and disagree so this is an individual comment. (C1)

The next two athletes equally attributed natural talent and their environment to their development of exceptional skills. One of them also said that her culture influenced the choices she made during her childhood. Because hockey was part of the Canadian culture and she was encouraged to participate, it was the sport she selected and grew to love.

Obviously you're better at some sports than others. It's probably maybe a little bit of being born with some natural skill and then it's your environment that sort of dictates which sport you get into. Hockey is part of the Canadian culture but if I were down in the States maybe it would have been basketball that I would have started playing at six years old. But up here, that's something we didn't really start until junior high so by then, the love of hockey was already deep within me. I'd say there is a certain degree of skill there and then maybe the environment you're in takes it the rest of the way. When I look at it, I didn't have a lot of purely unique goalie instruction at the beginning so I guess to some degree, it was natural talent. Not that the hard work wasn't there! (C6)

I was born with a natural drive. I knew that at a very young age because as a kid, I was a real live wire. If I wanted something and I did not get it, I would fly off the handle and I could be in tears. I was really aggressive and I think it has tamed down as I have gotten older, but that drive was always there. So when I started sports, I think I did have a certain amount of coordination plus that drive and aggression. It's just something that fit for me and that I could do. I think I was born with some natural ability and coordination but for the most part, I just worked at it a lot. That is what set me apart from the other people who were equal in talent as I was, but didn't like it enough to do it. I feel that my ability to work hard is a greater contributor to my success than natural talent. (C4)

The next citation is interesting because the athlete discussed how she had a natural ability to play sports in general, but did not have any talent in hockey, the sport in which she won four World Championship titles. For most sports, playing was easy, however in hockey, she revealed that she had to work very hard, even up until the last year she played.

I'm not a talented hockey player per se. I do not have the soft hands and I do not have the big shot. If you look at some of the other players on the team, I'm not what you call a talented, natural kind of hockey player. I'm a hard working hockey player and I probably use my potential to the max or close to it and I use my head a lot. I think I have some natural athletic ability but hockey per se, no I don't. Most sports I try, I do well at and some I've excelled at. So learning a new sport or playing sports definitely isn't difficult for me. I'm coordinated and I tend to be able to anticipate things. (R4)

Two athletes summarized their viewpoint by saying that they didn't think they were born with natural talent. For them, hard work and passion were the factors that contributed the most to their development and maintenance of performance.

I don't think I was born with a gift to excel in skiing moguls. My old coach says that I was. He said I was born with a God given talent for skiing. I think that everyone must find their path. I found it in this field and exploited it to the max, I'm still exploiting it. There are musicians, extraordinary piano players and for them, it's that. We each have our own path, we each have something to do. I'm talented in moguls but I think it

comes from a passion. It was my passion that brought me to where I am. This passion led me to do additional exercises, put in extra effort, and develop abilities to assimilate things more rapidly, because that's what I love to do. If I had a natural talent for skiing? I would say no. I simply developed it, and I think that everyone can develop their talent at any age.

(C5)

I think that you need talent to reach the top and most of the athletes who are at the top are that way. They have a lot of natural ability or talent but some of the athletes at the top are not that way. I don't think that I am an athlete who has had a lot of natural talent. I think I am an athlete who has had to work hard to achieve my skills and so it goes both ways. Both types can make it to the top. (C3)

In sum, the athletes possessed several physical and mental attributes that contributed to their development during the sampling years. Their motivation, hard work ethic, ability and desire to set goals, and natural talent were perceived to have played a role in the achievement of their success.

1.2.1.3. Training

The athletes' personal characteristics impacted on the way they approached and engaged in training activities. For example, athletes with a strong work ethic carried this into their training milieu to develop various skills and improve their overall performance. Motivation and goals also influenced what they accomplished during practices. The inductive analysis of the

transcripts revealed that during the sampling years, training took on several forms and was oriented in a particular way. Physical training will be discussed first.

1.2.1.3.1. Physical Training

Physical training was not a structured component during the sampling years. In fact, it was done on a more informal basis and without any specificity or help from a coach. Only four athletes commented on this aspect of training. Athlete C2 said she did weight training on her own during her first year of university, whereas C6 said she didn't do any weight training, although she played many different sports throughout high school. Athlete R2 talked about running to stay physically and mentally fit. For athlete C5, physical training was done through play on a trampoline in his backyard. He revealed that through this activity, he developed muscles that helped him later on in his career.

When I was young, we got a trampoline at home because we lived relatively far from the city and we got this to entertain ourselves. This trampoline was extraordinary. I developed muscles that helped me a lot in my sport. I developed impulsion and spatial coordination by doing jumps on the trampoline. I fell quite often too, which didn't do me any harm because I learned a lot from that. We would spend our entire days on the trampoline. We tried new tricks without having any knowledge base, but we learned. With my sister, we would find a way. Our friends also came to play with us and we had a lot of fun. (C5)

1.2.1.3.2. Mental Training

Another category that emerged in addition to physical training was mental training. It is important to note that anything that had to do with the development of

cognitive abilities and personality, as well as information related to structured or unstructured mental and emotional training, was categorized under mental training. Once again, this category was not a predominant one in the sampling years, which does not necessarily suggest that it wasn't important, nor that the athletes did not develop cognitive abilities. It can only be inferred that the athletes did not focus their attention on this particular topic when they discussed their early years. There was, however, one athlete who referred to it. She indicated that the conditions under which she played hockey led her to develop determination and perseverance.

One of the things that helped me when I was growing up was playing with the boys. I wasn't dressing in the same dressing room as they were and I was often a target on the ice and off the ice so I really learned how to develop perseverance and determination. For me, it wasn't so much the team practices at the rink but being on the outdoor rink and just having fun. To have fun was a huge thing at that age. And personally, proving myself every time I went out on the ice was a huge thing because being the only girl on the boys' team, if I didn't play very well, it just gave people excuses to say, "You do not belong." So that was a huge factor that just gave me the drive so that every game I just wanted to perform. I think that really brought out the best in me and the worst, but most of the time the best. (C4)

1.2.1.3.3. Technical Training

Technical training was another component the athletes discussed. Some of them developed skills and technique in their sport of excellence at a very young age because

they were introduced to this sport in their early childhood. For others, they developed more general skills through various sports in which they engaged, which eventually helped them in their chosen sport. For example, C2 played volleyball before she began wrestling. She remembered deliberately practicing at home by herself, spiking the ball against the house. She did not have the help of a coach until she made the high school team in grade 11. Also, as previously mentioned, C5 practiced skills on a trampoline which helped him to develop not only physical but also technical skills that he later incorporated into jumps in his mogul races. Another creative exercise that he did is illustrated in the following citation.

I did another type of training when I was young. We have a gulf running behind our house and it is divided into islands. The water level is controlled by dams and the level was often really low so I would run on the rocks, which was a movement that was very similar to skiing moguls. You have to put your feet on the rocks at the right time. This gave me an excellent type of training during the summer. I developed a lot of impulsion by running on these rocks and jumping over water puddles. I even developed a sense of anticipation because I had to put my feet on the rocks and rely on my kinesthetic awareness because I knew that they were mobile and not very solid into the ground. So the rocks often tipped in the right direction and this allowed me to propel myself elsewhere. This was a type of education that was a game at first but it was extremely helpful to obtain good results in my sport.

Other athletes coached by their fathers in the early years remembered acquiring good technique due to repetitive practice and drills.

Training was not difficult. We only practiced three times a week and the main emphasis was on drills because my dad and other coaches wanted us to have good technique if nothing else, so that was what we concentrated on. I can't remember any type of fatigue or pain in our workouts when I was that young and I think that it is important that young people see it like that, like it's fun. When they get older, they can start pushing it in the workouts. (C3)

I remember my dad was really big on these drills called FIA drills. They were a set of drills where you skated around the circles and it was a set pattern of drills and we would practice those for hours on end. I remember just thinking, "Oh I hate these drills." But in the end, it was the greatest thing he could have ever done for us because we learned how to skate and handle the puck and learned how to do the basic skills at a really young age before we really got into games. (C4)

The next athlete recalled enjoying and benefiting from the technical drills she did early on even if it was sometimes painful because she did not have the best equipment to protect herself.

I remember the two assistant coaches would always have the job of shooting on me while they would be doing skating drills at the start of practice. The shoulder pads weren't very good, so after a while, I would just be like, "Ouch." The next shot, "Ouch." But in spite of going home

with bruises after practice each week, I still loved the position and enjoyed that. On Saturday mornings, I would go to a goalie school and I remember my coach taught the butterfly style, at least on dekes, so that probably would have been the first real instruction I would have had in the position. I always enjoyed that. We would set up stations and maybe be out there one hour or so, getting shots. I did that my first two seasons as a goalie.

(C6)

Athlete C2 was not introduced to wrestling until the age of 20. However, she recalled wrestling around with siblings and friends at a very early age. Although she was not purposefully developing any technique per se at that time, she practiced several movements and acquired skills that helped her later on in her career.

I enjoyed wrestling around with my brothers and sisters. I grew up in a family of five kids. I'm the middle child. I have an older brother and sister, and a younger brother and sister. I remember wrestling with my brother, two years younger. We always had good matches, well it was more like fights, it wasn't really just wrestling, it ended being a little violent at times. There was no technique involved, it was just taking the person and trying to get on top. So I picked up a lot from my brothers, just doing it, just practicing. (C2)

1.2.1.3.4. Orientation

The environment in which training occurred in the sampling years was unique. While it was set up for the improvement of skills and technique, it was also fun and challenging. It is evident that the element of fun was present in many aspects of the

athletes' lives during the sampling years. The citations that have been presented thus far frequently included the word fun or referred to the concept. When asked what was the most fun part of their training, two athletes replied that it was playing.

I think it was the games and traveling to tournaments but more so when I was actually on the ice. I would not say it was the social part because when I was younger between 6 to 10 years old, I was one of the boys and I looked like a boy. But when I started to get a little older, it started to get a little more awkward to hang out and be one of the guys. They were at that stage where the dressing room thing did not work out anymore so when we got on the ice, that is when I really was enjoying myself. (C4)

I think it was just the skating part, whenever I was skating, just sort of passing the puck around, just relaxing out there. It was the most fun, just fooling around. (R4)

The athletes were also asked what was most important in their training to improve their performance during that period. Three of the athletes reported that it was extensive practice.

I believe it was practice. It was practicing, practicing, practicing, and practicing on moguls. For me, this was the most important way to improve my performance. (C5)

When I first starting out as a goalie, it was probably the volume of shots, just being out there at practice and getting as many shots in practice and game situations as I could. Certainly back then I did the drills unless it was the goalie school but not too much was geared specifically for the

goalie. We didn't really have a goalie coach to work with me. When you look at the technical things we've done with the national team and in University, we didn't have any of that in minor hockey. Basically it was just go stand in the net and stop the puck. So I think that the more volume the better. The more you do, the better you'll get. Again it was very non-technical too at that stage. It was limited ice-time and basically I was just out there playing. (C6)

I don't know because I just remember playing. I never thought about things like that. I just played. I remember my dad would say, "You should learn how to take a slap shot and those things." So I did practice that at home, actually against the garage door. I had to learn how to lift the puck and that sort of thing. So I did practice that at home in the driveway but as far as on the ice, I don't really remember other than we were just practicing. (R4)

1.2.1.3.5. Schedule

Another category that emerged from the analysis was the athletes' training schedule. The athletes were asked about the number of hours they trained and the number of practices they had during the sampling years. Table 11 in Appendix L summarizes the training schedule the athletes followed during different stages of their career. Note that one athlete did not provide the number of hours he practiced during the specializing years.

The number of hours the athletes trained per week for their specific sport of excellence during the sampling years varied between 0.5 to 8.5. This number would have

been higher if the number of hours they played or trained for other sports would have also been considered, however, the information was not detailed enough to be able to do this. Once again, the hours of training were mainly devoted to the development of skills and technique through drills or play. Dry-land activities or physical training such as weight lifting were practically non-existent. The number of hours they trained in the other stages of their career will be discussed in subsequent sections.

1.2.1.4. Competition

In addition to training, the athletes addressed the topic of competition. More specifically, they discussed the age at which they first started competing, the frequency of events during the sampling years, performance outcomes, and the fun involved in competition. Their starting age will be presented first.

1.2.1.4.1. Starting Age

Results revealed that the athletes began competing in their sport of excellence at different ages. For example, R3 started competitive swimming at age five but the main emphasis was on fun. C4 and C6 started playing in hockey tournaments at approximately age seven. R4 who also played hockey started a year later when she was eight years old because she only joined the sport at that age. Although C5 started skiing for fun at age seven, he only started racing when he was 15. Following are two excerpts from the interview transcripts that provide more information on this topic.

My first competitions were when I was seven but they were just in the region where I lived. I went from easy to more demanding things and I think that was a really good step to learn more about my body. (R2)

I remember playing a lot of games when I was younger. We had tournaments and I was often playing two or three games a day. I started when I was seven and it was just something that you did. We went to these small towns on the weekend, played a game, had a hamburger with our equipment still on, put our skates back on, and went and played another game! (C4)

One athlete shared her opinion concerning the appropriate age at which children should start focusing on competition in hockey.

I think they should start serious competitions around age 12 once they're hitting their second year of peewee. They could start playing at around age six and that would give them about six years to get the basics and the fun. Around age 12, it could start to get a little more competitive with tournaments and league play and things like that to give it a little extra focus. (C6)

1.2.1.4.2. Frequency

Four athletes talked about the opportunity they had to play many games or participate in several events during their childhood. They perceived this as having contributed to the development of their performance.

We probably played anywhere between 50 to 80 games a season, which is a ton of games. I think that was a huge advantage for me growing up and just being on the ice a lot. (C4)

At the Atom level, they didn't have any rep teams that went in tournaments at that point but when I hit Peewee, there was a traveling team that I could

play on as well. So I started playing on both the house league and the all-star team. Some years we would have two goalies on the team and then in alternate years, I would be by myself. Just getting the playing time and being in as many game situations as possible was good. (C6)

I don't know if it was in Peewee or Squirt, but there was one season where we played like 70 games. It was nuts! We were traveling all the time but as kids, we loved it. Our parents must have gone crazy! (R4)

Every Saturday we competed and that was a lot of fun. Our meets were all over so there was a lot of competition. (C3)

1.2.1.4.3. Performance Outcomes

As some athletes discussed the outcome of their performances in the early years, it was interesting to see that some experienced more success than others in formal as well as informal competitions.

I was a little runt but I was really tough. I arm wrestled kids in junior high at lunch hour. I'd arm wrestle the boys for fun and at parties, I'd arm wrestle, leg wrestle, and I'd beat people. You would think that I wouldn't beat people because I was smaller. (C2)

When I got to junior high school, that is when I started doing hurdles, but I wasn't really that great then or at a very young age. I would finish closer to the back of the pack and I really did not come around until I reached puberty late in junior high, and that is when I really started running well. (C3)

We won the Nova Scotia Championships and went to Nationals when I was in my second year at Acadia University. We didn't fare very well at Nationals but at least we went! That was my first introduction to a higher level of female hockey. I got to see and be part of it. (R4)

As highlighted in previous sections, athletes C5 and R3 experienced considerable success when they began competing. Athlete C5 started competing at age 15 and won his first race. He revealed that this inspired him to continue skiing. At age seven, athlete R3 was already competing against children who were nine and ten years old. At nine years of age, he was competing at a national level, and at 12, he was breaking national records. This increased his awareness of the potential he had to excel in swimming.

1.2.1.4.4. Constraints

Although they had fun in competition, two of the athletes who played hockey said that they faced certain constraints due to the fact that they played with boys. The following citations illustrate the challenges that this created for them.

I think the worst thing was getting dressed at tournaments. I couldn't change in the dressing room with the boys so I ended up changing in the washroom at the bowling alley across the street or in the washroom at the rink. Sometimes people would come in and look at me like, "Who the heck is this in here?" (R4)

When I started to get a little older, it started to get a little more awkward to hang out and be one of the guys. They were at that stage where the dressing room thing did not work out. (C4)

In sum, the analysis revealed that the athletes started competing at various ages and for the most part, it was something that they thoroughly enjoyed. It was an opportunity for them to travel and socialize with friends and to gain experience that would serve them well in the years to come. Before discussing the athletes' transition to the specializing years, the parents' and coaches' perceptions regarding topics addressed in the sampling years will be presented.

1.2.2. Parents / Coaches

The parents provided information on the context within which their children developed when they were young. They also discussed their children's personal characteristics as well as the type of training they did when they were first introduced to their sport. It is noteworthy that their perceptions confirmed those of the athletes. In some cases, they shared additional information that complemented the data elicited from the athletes. The next section will focus on contextual factors that were important to their children during the sampling years.

1.2.2.1. Context

In terms of the context, the parents talked about their role in introducing their children to sports, the support and guidance they provided, the coaching their children were exposed to, and differences they observed between siblings.

1.2.2.1.1. Introduction to sports

The following citations illustrate the parents' perceptions of how their children got initiated to sports, and in most cases, their sport of excellence. It is interesting that as reported by the athletes, most of the parents mentioned that they were athletic and started playing sports with their children at a very young age. The sports that the children

practiced were mostly those that the parents practiced or coached or sports that were prevalent in their community.

We lived in a house that was two doors down from a community swimming pool and we belonged to it so that's where he got his first introduction to a swim team. I wasn't working so we spent a lot of time there in the summer and he saw the big kids swim. I think he joined the swim team when he was five and he could barely make it down the end of the pool! But it was just something to do, it was fun, he enjoyed it. There were no soccer teams and there weren't as many things going on in the summer for the younger kids then as much as there is now. So that may have had something to do with the fact that he got into swimming. (PR3)

The whole family would fool around in the yard. We were very sports minded. She would always be there keen to do everything that the older kids were doing. I coached badminton for years and she wanted to play before she could reach the bottom of the net. She started playing on a hockey team when she was eight, but she played around on the ice with her friends before that. They played road hockey too probably before they started school. (PR4)

We introduced her to as many things as we could. I wanted my three girls to learn how to swim because as a child, I taught myself how to swim and my parents didn't swim. I wanted them to be able to swim so that if they were in a boat and it capsized, they could get to shore. There was a community outdoor pool where we lived and I signed all the kids up for

swimming lessons. They also took a little bit of ballet and I think one fell into the other and they all took to synchronized swimming. (PR1)

Her mother and I are sports minded. I can recall when she was three or four, I'd have the hockey game out and she would pay much attention. I took her to a game at the Gardens and after that it caught her interest. At the age of six, she decided that she would like to play hockey and there was an active girl's league in Mississauga so she started playing female hockey at about that age. And it just took naturally from there. She and I used to go down to the basement with a tennis ball when she was quite young and she just loved hockey from the start. (PC6)

We lived in a small town so the rink was the center of our life. I used to take her there when she was as young as three years old and we would go every night. We started her off on bob skates, the twin bladed ones, and then she got her balance pretty quick. She was good even at a young age. (PC4)

The next parent confirmed that it was C5's sister who introduced him to skiing. She was instrumental in getting him to start competing.

It was his sister who got him into skiing. She discovered acrobatic skiing the first year and then the next year she asked him to enter competitions with her. He was really shy and weary about competing but she decided to sign him up with two of his friends and he has loved it ever since. (PC5b)

1.2.2.1.2. Parental support

The role of the parents extended beyond playing with their children when they first got involved into sports. Ongoing parental support and encouragement was very important. It involved driving their children to training sessions, attending meets, and in some cases, helping out with organizational tasks.

All of our kids have been in sports. We went to their games and we encouraged them to participate in sports all the way through. They didn't miss their practices or games. We made sure they got there because we are 20 odd miles from where they went to school. We have a mixed farm here so we're always busy but they had our support and they were always able to get to their sport whenever they wanted. They all had cars when they were 16. We drove them when they were young, and then later, the older would drive the siblings themselves. (PC2)

When there was summer league, it was just being supportive and going to the meets. I did some timing and ran some sessions. There was no car pool at that point because we lived so close. Of course, when he got into year-round swimming, it was car pools, helping at the weekend meets, just being supportive, and doing as much as I could to help him. We had a very good group of parents. We actually lived about 30 minutes from the pool, so it wasn't a matter of driving the kids and coming home. We went and spent our evenings at the pool. So that was how it went and he was going six, seven days a week. (PC3)

I supported her all along the way in everything. I supported her just as much in hockey because she loved it and I understood that if she liked it that much, why not do it? I liked hockey too as far as that goes and I used to take her to all her games and just encouraged her. I was certainly more involved when she was still living at home, but when she was in university, I would go to the games that I could. (PR4)

In the next citation, a father revealed that parental guidance also involved teaching his daughter good life habits and time management skills that would serve her well in both school and sports.

To get to the level these girls do, you have to give them parental support, there's no question about it. She used to go in eight or nine tournaments a year and play two games a week so we were running back and forth to the rink. I think that a lot of people pocket that but it's quality time. When we drove two hours to go to a game, there was a lot we could talk about as a family. It takes that type of attitude. Part of it was also helping her develop good living habits. Her mother was a nurse to start with so she played a role in her diet. Our daughter has never been one to eat junk food or sweets like I do! But you have to start them at an early age in my opinion. I don't think you can take an out of shape person at 18 years of age and work them into shape to play at that level. Her mother also helped her organize herself to do her school work and play hockey. (PC6)

1.2.2.1.3. Coaches

The parents also provided information on the coaches their children had during the sampling years. There was a general consensus that they had access to good coaches.

There weren't a lot of choices around here when he started swimming.

There was only one year-round team. It was a matter of taking what was there and he was lucky. They were good guys. They were very good coaches. (PR3)

As three of the athletes mentioned, their father coached them during the early stages of their career. The next citations reveal how one father, PC3, faced some challenges in playing the dual role of father and coach whereas PC4 and PC6 did not experience any difficulty. The fathers had extensive experience in the sport they coached and in performing associated administrative tasks.

I coached him in track and field from 7 to about 18 years of age because that was my sport when I was in school. I had a track scholarship in college and I knew a lot about the sport. What happened was I started a little league track team with a few other neighborhood fathers. We traveled to different places and the kids ran in these track meets. We had fundraisers to raise money for our uniforms and transportation. We did that up until high school. Playing the role of the father and the coach was very, very tough because to him, I was just his dad and what do I know! A coach to him was someone else, not his father. I had a few problems trying to train him in certain things because he wouldn't listen. He wasn't really obnoxious or anything. He would just rather listen to the other coach than me. As he got

older, he began to realize that I knew what I was talking about and then he began to ask me various questions, especially when he got into late junior high school and high school. He would always come to me to critique his races afterwards. (PC3)

I started coaching her when she was about five when she was on her first team. She had to work hard and I was a little bit hard on her but you pretty much have to be. The coach's kid syndrome, you have to make sure that there's no favoritism. So I probably pushed her and gave her an extra shove more than some of the other kids. Plus, I expected more from her. She was good and she was a team leader. So she could really help with that. (PC4)

I wound up coaching her three years into it. She played house league with a guy I know for two or three years and I had to go to the rink anyway so I ended up coaching. I didn't find it difficult to play the dual role. I've been involved in hockey for years. I had played until I was 16 and then learned more at coaching clinics than I was ever taught playing hockey myself, from a technical point of view. I've also been on the executive of the Ontario Women's Hockey Association for the past 10 years. (PC6)

1.2.2.1.4. Siblings

Several parents noted some differences between their children. Although they made an effort to raise them the same way and provided them with the same opportunities, the children who excelled at a high level had interests that differed from

those of their siblings. Overall, all siblings within a family enjoyed and participated in sports, but they often did at different levels.

I have a son and another daughter who are both older than she is. I noticed differences in their interests. She was not that interested in dolls like my other daughter. When she was small, most of the children her age in the neighborhood were boys whereas my older daughter seemed to play more with girls. (PR4)

One father admitted that he gave more attention and spent more time with his eldest child because she demonstrated an interest to get involved in sports and showed a lot of potential. He just provided many opportunities for her to develop her skills.

Unfortunately, you spend different amounts of time with your children. Your first one is always going to seem to have the best from you. When I was in sports, she was the bat boy. None of the other ones enjoyed the same kind of consistency as that. I always brought them along and made sure that they had the same opportunities but it was never as much as what she did. So I always think that the first born gets a lot of time and attention, more than the other ones. You have to give a certain amount of attention to the one who is best able to handle it and it was her. She was the oldest. (PC4)

1.2.2.1.5. Enjoyment / Early success

The parents reiterated what their children said about enjoying their sport right from the beginning. They also confirmed that most of their children experienced success very early on.

She was very interested in sports, particularly team sports, probably because she was pretty good at them. She just loved hockey. She watched it, especially on t.v. Then the next day, she and a friend of hers would do a rebroadcast of the game. They would take on the announcer's job! (PR4)

He entered the competition and finished first. That year, he did three competitions and won all three of them. That was the beginning of a long career. It became his passion. (PC5b)

Once she picked up skating on her own, she did really well. Then I started flooding an outdoor rink across our back alley. I kept that backyard rink going for about four years. She had opportunities to be out there all the time and it was great. She would come home from school, put her skates on and go play hockey and all her friends from the neighborhood would be there. Again, she really liked to do it. It wasn't something, "Ok, now you go out and do this." She would go out and play on it every day. (PC4)

One father validated the fact that his son did not succeed at first in track, however, because he enjoyed the sport, he motivated him to continue. He emphasized that enjoyment was more important than results.

He was never a winner back then either. He was just mediocre. He would get frustrated with that but he never gave up. That was another quality with him. He used to say to me, "Daddy, I don't know why I'm running because I'm always coming in last." So I would tell him, "Do you enjoy running?" and he would say, "Yeah." I told him that that's what was important. When

it wouldn't be fun anymore, then we'd talk about stopping. That's why he continued with it. (PC3)

1.2.2.1.6. Variety

All parents said that they encouraged their children to participate in various sports and activities. Two fathers mentioned that they wanted their children to be well-rounded persons so they provided several opportunities for them to develop skills in different areas like sports, music, and academia.

As he was coming up through the elementary, junior high, and high school ranks, we weren't interested in him being a superstar. We were more interested in him being a well-rounded person. And we felt that education, the arts like music and dance, sports, and community involvement would help him reach that particular goal. It was the same way for all of our children. They played many different sports and I would just transport them back and forth. [C3] did excel in music in the drums and he excelled in track and field. He played football and also took gymnastics. He was fairly good in that and then he excelled in his school work. He's never missed the honor roll one year that he has been in school from elementary right on through college. (PC3)

Most of the time, we'd do everything on weekends. We would play a little floor hockey, hit a badminton bird around, all different sports. She tried figure skating when she was about six but she didn't carry on with it. She took piano lessons too. We wanted her to be a well-rounded person. So we encouraged her. I just wanted to introduce her to a lot of sports and

activities. I tried to give her all the opportunities and a lot of encouragement. I encouraged hockey too because again, there wasn't really much for girls to do. (PC4)

She has done a variety of sports including volleyball and softball. Then on the farm here, she was in the Four H beef club and she loved to lead her calf around. (PC2)

I think she was a very strong person mentally from a very young age and she always wanted to play every sport. She was as high as the bottom of the badminton net and she would want to play, and it was the same with everything. (PR4)

He tried different sports. He played hockey but didn't like it because it was too violent. He did gymnastics and was really good on the rings but the coach didn't have any discipline so he didn't want to continue. He would get frustrated when others wouldn't wait for their turn. He already had some self-discipline and knew when things were not working out for him. Then he started skiing and that's all he wanted to do! (PC5b)

In sum, the parents were involved and took pleasure in introducing their children to sports. They played with them and encouraged them to participate in a variety of activities. Their children enjoyed sports and they generally experienced early success in sports, including the sport in which they eventually excelled. According to some parents, their children had access to good coaches. Three of them coached their children themselves. Furthermore, although the parents made an effort to provide the same

guidance and support to all of their children, some of them noted differences that could perhaps explain in part why their one child excelled at a very high-level in sport.

1.2.2.2. Personal Characteristics

In addition to discussing the context under which their children evolved in the early years, the parents shared their thoughts on some of the strengths and personal characteristics their children possessed.

1.2.2.2.1. Determination

Several parents mentioned that their children had a lot of determination to do well at a very young age. In the next citation, a mother reported that the fact that her daughter was a middle child and was often left alone could have helped her to develop perseverance and determination to make it on her own.

We have five children. She was the third child so she was the middle child. The older two were always bigger, I mean a good size for their age, and they were close. The first one was a boy and then a girl so they were two and three years older than her so she was sort of left out more, you know, the little girl. I think maybe that helped in her determination to succeed. She had to work that much harder to do what she had to do so maybe that was an education. (PC2)

He was always positive. Once you showed him something, he did not want you to help him after that. From tying his shoes to showing him anything, he wanted to work on it until he got it himself. He would work and work and he would get frustrated but he would work on it until he got it. My other children weren't like that. (PC3)

When you think about it, at nine years old, he started swimming six days a week and then, a few years later he picked up double so he started going in the morning too. He gave up everything in high school because he was swimming. Not too many kids have that kind of dedication and he did. Some kids would burn out and just not do as well, or they would loose interest, but he was one of the lucky ones. (PR3)

The following father complimented his daughter on her determination and strong work ethic. He was a determined person as well, thus he believes that his daughter could have learned this from him.

She was determined. I liked that because she would fall and she would get up and go again. You wouldn't have to beg her. She would always be ready to go. She really worked hard and she was very competitive. I always made sure she got complimented on that. So right from an early age, she had some ability but she had a lot of determination. I probably may have influenced her there too, because I was very competitive and I wasn't a good loser at anytime and I think she picked up on that as well. (PC4)

1.2.2.2.2. Need to improve

In the next two citations, two parents shared how their children always wanted to improve. Being a perfectionist and a student of the game were terms they used to illustrate this.

She was always sort of a perfectionist, even from grade one. She'd come home and I'd say, "That's good!" and she would say, "No, I think I can do better." So she always put that kind of honos on herself. (PR1)

We'd watch NHL hockey games on t.v. together. We'd comment. She was a student of the game. We'd look at different things and analyze why a team didn't win. (PC4)

1.2.2.2.3. Creativity

It was interesting how one mother revealed that her child was creative compared to her other children. She partly attributed this to the fact that her daughter was often alone and had to play games on her own. It is noteworthy that C2 did not mention in her interview that she thought she was creative.

She always creates her own things and maybe being a middle child, she did her own things, created her own games and things like that. She's just different that way. Actually, the other siblings always say that she's a pain in the neck sometimes because she's always nagging for them to do something. (PC2)

1.2.2.2.4. Innate abilities

All of the parents and coaches were asked if they thought that the athletes were born with a gift to excel in their sport. All of them said that they believed their children were born with certain characteristics that helped them at some point in their life. The next two parents believed that although their children had natural ability, they were not specifically born to excel in their particular sport of excellence.

I don't believe that she was born with certain abilities to play hockey. I believe that they are particular skills that are developed through practice. For example, I don't see a person who can play the piano well as being an extraordinary person because there are lots of people out there who can do it. You need the dedication to practice. It's just different skills in my opinion. (PC6)

I don't think she was born with skills to wrestle. Maybe it's just her determination to do something that is not expected of her. She was maybe born with that but not skills. Actually, she probably has the built for wrestling because her dad is built like a wrestler but just in that way as far as genetics. I'm quite athletic too and I have been fairly strong too so I think in that respect, it could be genetics too. (PC2)

The next three parents mentioned that their child had natural ability but they also stressed that they had an ideal environment in which they could perfect their skills. They believed that their support and encouragement was instrumental in this process.

He had a natural ability and then he had good coaches. He also had support from his family, parents, grandparents, on down the line, and he enjoyed it. I think that there are a lot of people out there who have the talent but if they don't enjoy it, they quit. Or, there are a lot of people who work their butts off and just don't quite have the talent. He was just lucky. He found a sport that he excelled in, and he enjoyed doing it, and he got the support he needed from everybody who surrounded him. I think everybody has a natural talent, it's just whether or not you find it. He was

swimming so well when he was so young with very little coaching, he was a natural at it. (PR3)

I guess it's just something that she was born with more or less. You see some kids who are three or four years old who aren't coordinated. She just seemed to be very well coordinated and smart. She certainly had a lot of help along the way. We always let her do what she liked, otherwise she probably wouldn't have been playing hockey. If we had looked down upon it she wouldn't have played very long. We just let her do what she liked to do and she was very good, so how could you say no? (PR4)

She was really quick and quickness is something you are born with. I don't know if you can develop that. She was coordinated. She was really strong for a kid her age. Again a lot of it is heredity and a lot of it is developed. I hung a rope from a tree in our backyard and the kids used to climb up and there's your upper body strength! That's one of the knocks against girls. They don't have upper body strength. This was one way around it. I just tried to have some stuff there to help them but it was still up to them to make the choice and then work at it. It didn't take her long to catch on to things. She listened and then she worked really hard. So a lot of it she did but certainly she had some gifts that she was born with. (PC4)

In the following citations, the parent and coach of R1 shared that she had inherited certain physical abilities that highly contributed to her success in synchronized swimming. However, they recognized the fact that she was also very determined and

disciplined. It is interesting that the mother said that all three of her daughters were gifted and could have excelled at a high level in that sport.

My husband and I have always played a lot of sports and my dad was also a very good athlete, so were my husband's folks, really. I think that all three of my daughters were just naturally better than average and they chose a sport they felt they had some talent towards. I know that when my eldest daughter was about 15, they more or less said, "I wish I'd gotten a hold of you earlier because I think you could have won backstroke at the Olympics." I couldn't see it because I didn't know about this. I think that if my middle daughter wouldn't have had poor joints, she might have been [C1's] partner and won the Worlds in duet. They all more or less had a drive to do the best they could and I never never pushed them in anything. (PR1)

Physically, she was talented. She had a great kinesthetic stance and a big aerobic capacity. She could handle a lot of work specific to our sport, like she could hold her breath for a long long period of time, probably longer than any other athlete in the world. Also, from the measurements that we did, she had what is called "airy bones" so she wasn't as dense as some athletes so she was more buoyant in the water. She was very lucky that she had these physical attributes but if she hadn't had the mental discipline or the drive and desire or the intention to become the best in the world, it wouldn't have made any difference. So I wouldn't isolate any one thing and say that that's why she became a World Champion. (CR1)

In the next two citations, a coach and a parent highlighted the fact that although practice and hard work are required, athletes must be blessed with certain natural abilities to succeed in some sports. CC1 believes that it is very difficult for someone who is born with less genetic potential to catch up with others who are born with some natural ability.

I think speed skating is absolutely a technical sport. If you would just categorize physiology and technique, it would be something like 95% technique and 5% physiology. I think a lot of the good skaters are technically very gifted when they're younger. [C1] was gifted in two ways. She's naturally very fast and very strong and she's technically very gifted. You can certainly develop muscle mass and you can develop power but some people will start at this level and some people will start down there. People will move up and it's very difficult when you're starting at a much lower level to ever be as strong as some of the strongest people. There's definitely a difference. I think you're crazy to say that anybody can do any sport and reach the same level of success. There are some sports in which you'll be more gifted because of natural selection. (CC1)

Attitude, diligence, perseverance, and constantly going after it is what makes a World Champion. And sometimes that doesn't work, it's not enough. You have to be blessed too and a lot of that is God given talent. Some people will never make it no matter how hard they work. Some can do it just from sheer hard work but a lot of them have a God given talent. That's something you can't coach. You have some athletes who get out there and do things that you just can't coach. Like speed is a God given

talent. Once athletes reach a certain level, they either have it or they don't. (PC3)

The next coach believed that C2 was born to wrestle but that the opportunity was there for her to seize it. He thought she had natural talent but he also mentioned that she wrestled all of her life before she even got introduced to the sport in university. According to him, this prior experience significantly contributed to her ability to wrestle and rapidly improve in her sport.

Whether it was natural ability or growing up on the farm with the five kids, she was going to be a wrestler some day. It just so happened that the opportunity arose and she was the first one to jump in there and take it. She had natural talent because she came from being an untalented person to being a World Champion. She definitely had a base of skills and abilities that served her well. But she's always loved wrestling. She wrestled with her brothers all the time. She tells me she used to wrestle her friends in school and that's why she took that wrestling course because she thought it was a really neat sport. So by the time she started wrestling, she already had a wrestler's mentality. (CC2)

In sum, the main findings in this section are that the athletes had a lot of determination to learn, work hard, and do well when they were young. Although the parents nurtured their development through love and support and provided them with opportunities to practice, they believed that they had some natural ability that helped them to succeed in their sport. All three coaches also felt that the participants were genetically endowed.

1.2.2.3. Training

The parents did not provide extensive information regarding the training their children did during the sampling years. However, the next citation by one of the parents confirmed that his daughter attended goalie school and trained with excellent coaches.

In terms of her progression, she went to goal tending school and in those days, a girl in a boys' goal tending school was not that common but she got excellent help there. She went every Saturday morning for two or three months and she'd get more coaching than I could ever give a goalie with 16 players on the ice. She had good coaching and competition which brought her skills along as well. (PC6)

1.2.2.4. Competition

Competition during the sampling years was another theme that was not discussed at length by the parents. Note that the three coaches who were interviewed did not provide too much information that pertained to competition either. Overall, they did not really discuss the sampling and specializing years. They coached the athletes at a high level, thus they focused more on that period of their career. One parent who coached his son during his childhood did report that play was more important than competition at that age. Although they attended competitions, there was no pressure on the children and they basically went there to have fun.

At that age, it was just play. I had to pull him out of the sandbox to get him ready for the event. They would run around the bleachers and so forth. You couldn't put pressure on them because they were very very young. You wanted to make it fun for them and that's exactly what it was. He and

his friends had a little relay team but they were more involved in running around and wrestling than they were in track and field. He didn't become really involved until he got in junior high school. (PC3)

In sum, the parents, and in a few cases the coaches, shared valuable information that confirmed and / or extended the information that was provided by the athletes. The context in which the athletes grew up was very nurturing, supportive, and diversified. Already at a young age, the athletes had acquired or developed strong personal characteristics that benefited them later in their career. Based on the brief information provided by the parents, training was initiated during the sampling years and competition gave the athletes opportunities to play and have fun. The following section includes citations that illustrate the transition the athletes made from the sampling years to the specializing years.

1.2.3. Transition from Sampling to Specializing Years

The athletes progressed to the specializing years when they narrowed their participation to one or two specific sports. In other words, they started to specialize in one or two areas rather than being involved in a wide variety of sports or physical activities. Their transition into the stage of specialization was reflected in the citations presented in Table 6. These citations indicate that different events marked the athletes' transitions. For some, it was characterized by moving to another city to pursue their education or find more opportunities to develop in their sport. Other athletes made the transition when they joined a new club as a result of a sibling or a coach.

Table 6

Citations Reflecting the Athletes' Transition from the Sampling to Specializing Years

Athlete	Citation
C1	<i>I actually started with ringette. My sister had seen a poster for speed skating and the transition actually from hockey skates to speed skates wasn't as drastic as from figure skates to speed skates. It's the same principle as for hockey skates and I just decided to give it a try. She was really enjoying it.</i>
C2	<i>I went to the University of Alberta for 4 years. It was in my second year when I got introduced to wrestling. I was studying to be a math and phys. ed. teacher and I took the wrestling activity course. It's called a Pack Course. After that course they asked me to continue wrestling and that's how I got into wrestling.</i>
C3	<i>When I got to junior high school, that is when I started doing the hurdles.</i>
C4	<i>In 1990, my family moved to Calgary because my parents are both teachers. So in search of teaching jobs and better hockey opportunities for myself, my brother and sister, we moved to Calgary. At the time, I was trying out for Team Saskatchewan with the Canada Winter Games team and then I had to switch and try out for team Alberta in 1991. That was my first experience with female hockey.</i>
C5	<i>My sister started acrobatic skiing a year before me and said, "You know, you are good in moguls, so why don't you try too?" So I said, "Ok." I took a risk and won the race in my category. When you win a race at 14 years old, it motivates you to continue. So that's how I started.</i>
C6	<i>I went to U of T and played four years for their women's team. I also did four years with the Toronto Aeros club team at the same time I was playing for U of T so it was good.</i>
R1	<i>By the time I was 14 years old, I joined the Club Aquatique Montreal Olympic. I was training about 3 hours a day and that was about 6 days a week. So the hours of training escalated pretty quickly because I was improving pretty quickly.</i>

Table 6 (continued)

Athlete	Citation
R2	<i>I competed in track and field at the national level just for fun and there was a coach from the bobsled team who came up to me and just asked me if I would be interested in trying push training during the summer. I went there and observed what they were doing and had the chance to push a four man. The guys were European champions so it was a good level. I did well. I was second best. The coach noticed my abilities and called me one week later to ask me if I would be interested in being a spare for them in the winter. I told him I would if it didn't take too much time because I still had my studies. So that's how I got started.</i>
R3	<i>I actually got recruited to swim year round when I was nine years old. Actually I wanted to join the year round team when I was eight but my parents wouldn't let me. I don't know why, they probably thought it was too big of a commitment and I'd have to travel 30 minutes one way to practice and probably it would have been three times a week. It was a commitment for my parents too and I think they wanted to make sure that I really liked swimming before I got myself into it. So it was the only time in my life that they've actually interfered with a decision like that. And it was probably a good move, or at least it didn't hurt. So at nine years old, I switched clubs and went from just swimming three months a year to swimming 12 months a year.</i>
R4	<i>I started playing hockey again in my second year of University at Acadia. I played there for three years.</i>

This section completes the results that pertained to the sampling years and the athletes' transition into the specializing years. The next section will present the results concerning the specializing years.

1.3. Specializing Years

The specializing years represented a period in which the athletes chose to narrow down their focus in order to be able to invest more time and effort into the practice of a few preferred sports. Training and competition became more important and structured at this stage and the athletes generally worked with knowledgeable coaches who facilitated the development of specific skills and technique. The athletes' perceptions will be presented first, followed by those of the parents and coaches.

1.3.1. Athletes

The athletes' perceptions will be discussed under the same headings as the previous section: Context, Personal Characteristics, Training, and Competition. The analysis of the transcripts revealed that some of the factors considered important at this stage were similar to those discussed in the previous one. However, additional issues were raised that contributed to the development of the athletes' performance. Certain aspects of the context in which the athletes were immersed changed. The context characterizing the specializing years will be addressed first.

1.3.1.1. Context

The athletes discussed factors that pertained to their family, coaches, teammates, and other athletes. They also talked about financial and educational resources as well as the structure and orientation of their sport.

1.3.1.1.1. Family

Just like in the sampling years, the parents were very supportive in the specializing years. They took a particular interest in their children's sport and recognized the fact that they required a higher level of coaching and took the necessary steps to

ensure this. They respected the decisions their children made to train and compete, or to take a break. They did not push them.

When I quit, they knew I had the potential. They said, "If you are not happy, that's fine. We want you to be happy. That's the most important thing." (R1)

My mom and dad were both there and still active but they took a step back because I think at that point, we realized that I needed some different coaching. So my new coach was really prominent right then. (C4)

I don't think anybody ever really pushed me. I'm sure they encouraged me. But I don't ever remember not wanting to swim or having a problem, or going through a burnout stage. One year when I was 13 or 14, I had trouble with it. My parents were great about not asking me to do things I didn't want to do or not pushing me, except for that one time they didn't want me to start swimming when I was eight. I could have gone to them and said, "I want to play football this year." They would have said, "Ok," instead of a lot of swimming parents saying, "No, I don't want you to play football, you have to concentrate on swimming." So I really had a lot of freedom to do the things that I wanted to do. (R3)

1.3.1.1.2. Coaches

At this level, the athletes often worked with different coaches than the ones they had in the sampling years. While these coaches were supportive, they offered a more structured approach to developing skills and technique but still made learning fun. Some athletes were exposed to a variety of coaches who had different coaching styles during

this stage. Others stayed with the same coach until they moved on to the investment years. The following citations demonstrate the type of coaching to which they were exposed.

We had about five coaches whom I didn't know directly. There was a big variety. I can't think of one impact they had except that they enjoyed what they were doing. They enjoyed our group. They were a bunch of guys who were a bit younger than me. In my club, there weren't that many girls and those guys were like my brothers and we were just really close. And coach wise, they are still supportive of me. They still send faxes and congratulate me. (C1)

My first coach coached me until I was about 13. He gave me a good introduction to swimming because he was a tough coach and asked a lot out of us. At the same time, he was a lot of fun but he did know a lot about swimming. He really coached me and almost coddled me to some of my first really good swims. He was my coach when I broke my first national record at 12 years old. So he was real valuable in a lot of ways. (R3)

They were both very different types of people. One was very people-oriented and he'd always be friendly and cheerful. He cared about winning but he was also a very good people person. I've known my other coach for eight years. Once you get to know him, you can see that he does care about his players as people, but initially, he comes across as being very intense and focused and all hockey-oriented. So they were two very

different people in their approaches to the game but certainly technically they were both strong. (C6)

When I started competing, things became more structured and I got a coach. I had the privilege to have a coach who showed me how to love my sport right at the beginning of my career. With him, you had to have fun, it wasn't complicated! I just adored training. Our coach empowered and encouraged us a lot. He would say, "Way to go guys, don't give up!" So I had an extraordinary base. My first coach taught us how to have fun. (C5)

Three athletes highlighted the fact that they really connected with their coaches and had good communication with them. Their relationship was based on trust and mutual respect.

We were very similar people because she has the same kind of drive as I do but hers was in coaching. We connected really well and I really enjoyed playing with the girls. I needed her coaching at that age. I started to get into the women's hockey mix so I got to know a lot of the other female hockey players around the province and coaches and got out of the male game and into the female game. The move was really difficult because I didn't want to move to the big city of Calgary but my coach really helped me to adjust. (C4)

That was really the key to my success when I moved to Calgary because I connected with a coach who connected with me and she was just an unbelievable lady who knew what buttons to push to get me to go. She got

me doing things that I never ever would have believed could have been possible. And she made it very challenging but very fulfilling. (R1)

My coach after that coached me through high school. Even in college, if I went home and needed to train, I trained with him. He ended up being a really good friend of mine in addition to being my swim coach. We always had a really good relationship and communicated really well. He kicked my ass a lot and at the same time I trusted him, which I think is really really important. I've been real fortunate with coaches. I've always communicated really well with them and gotten along and it's a reflection of me and them. I was never really one to question authority so if someone asked me to do something, I would do it and then asked questions later. So I always had a relationship of mutual respect with my coaches. (R3)

It was mentioned in the sampling years section that some athletes showed a lot of potential in their sport when they were young and upon seeing this, their coaches encouraged them to pursue it. Three of the athletes got introduced to their sport of excellence in the specializing years and at this stage as well, two of them mentioned that their coach recognized their potential to succeed in their sport.

I was excited about taking this class. I knew nothing about amateur wrestling. I had never seen it before. I took the class and I was the only girl but that was ok by me because I would wrestle my guy friends and my brother all the time, so I didn't think it would be a big deal. Everyone was really good in the class. I remember the first day the instructor said I could drop the class if I wanted to because I would be the only girl. I

thought, "Well it's no big deal. It's just an activity class." I wasn't going to let that stop me since I was so pumped about trying this new sport. I did really well in the class. That year is the year they decided to put in a women's division at the National Championships. So the coach at the end of the activity class asked me to join their club team and I did. (C2)

There was a coach from the bobsled team who came up to me and just asked me if I would be interested in trying push training during the summer... I did well. I was second best. The coach noticed my abilities and called me one week later to ask me if I would be interested in being a spare for them in the winter. (R2)

Although most coaches in the specializing years were perceived in a positive way by the athletes, three of the latter discussed barriers they faced due to a particular coach:

The coach would give us easy things to do. It wasn't exercises, nothing like that. It's a bit why I believed that going to the Olympics was impossible because I told myself, "I am not training like an Olympic athlete, that's for sure. I do sit-ups in my backyard." But it still worked. My will and passion was greater than anything else. (R5)

When I was training at this club, I had a great coach there too but she told me I would never be a world champion and when you have a coach who doubts your ability, you can't stay with a coach like that. I was 15 years old. I walked away and I was devastated because I wanted to be the best I could possibly be and that of course was being a World champion. So she really knocked the floor from my feet when she said that. I think that's

when I probably realized in the back of mind that I probably wouldn't be able to stay there much longer because she didn't believe in me. (R1)

The coach we had was a guy who was in our phys-ed class and we sort of begged him to coach us because we just needed somebody to coach us. So he came out and it was good because he was very patient but he didn't know a lot about hockey. (R4)

1.3.1.1.3. Friends

Aside from family and coaches, friends were also a valuable resource at this stage of the athletes' lives. For two of the athletes, their friends were definitely one of the reasons they stayed involved in their sport.

What really sticks in my mind are the training camps in the summer. There would be camps for all the Western provinces, just like we have now, but we would all get together. Those were the most fun because some of my good good friends were there. Again I see those things as what kept us going. (C1)

I played a lot of sports because my friends were doing those things and I wanted to be part of it. We would carpool with six or seven other kids to practice and that was always a lot of fun. I looked forward to getting picked up to go to practice, playing games, and that sort of stuff. (R3)

The following athlete discussed how she made a substantial change in her life and sport career because she wanted a new circle of friends. This indicates how important,

and in this particular case, how essential friends were in the development of the athletes' performance.

I guess what made me move to Calgary was the fact that I didn't feel like I was improving anymore. I felt like I was in a real stalemate. I also was very unhappy personally. I felt I didn't have any friends because I was just living my life at a swimming pool. I felt like a real loner in high school and my self-esteem was going down. So I needed a change probably more personally than anything else and I felt that it would almost be like starting over again when I went out to Calgary. I'm not talking about my synchro career, I'm talking about making new friends and that sort of thing, and just to try to find more support from my friends as opposed to in Montreal where I didn't really have any friends. I lost a lot of my friends because I was living in a swimming pool all the time. (R1)

1.3.1.1.4. Other athletes

Two athletes mentioned how they were inspired by other athletes at this stage. In one case, these athletes were teammates who provided support and encouragement to train in the most adverse conditions. In the other case, they were older elite athletes who nurtured one athlete's passion to keep working hard to achieve her goals.

Training wise, it was difficult, especially during the months of December to March. We were outside and it was so cold. It was fun but it was also exhausting because we would come home from school, have supper, then training would start at about seven at night. It was so cold that we would have to come inside. It was a real process just to get the training done.

Now, when I look back on it, we were tough and for sure it was the group of people that kept us going because if I would have been by myself in those conditions, there is no way I could have trained or do anything. (C1)

Seeing the World Championships on TV was a huge factor for me because I saw the players that I play with now on the national team. They were really inspiring and that just gave me the drive to keep playing and go for it. (C4)

1.3.1.1.5. Teachers / Education

All athletes attended school not only during the sampling years, but also during the specializing years. Depending on the age at which they entered the latter stage, some athletes were still in elementary school, others were in high school, and some were in University. School was an environment in which the athletes participated in sports, and for some, the sport in which they later excelled. For one athlete in particular, the teachers with whom he worked had a significant positive influence on his development:

When I entered that school at 16, I started sports again and that was because there were professional physical education teachers who had a lot of knowledge and a good background in training. I was motivated by these people again in school. They saw good potential and I was in a group there too who really made me feel ok. Sport was also fun there and I was not pushed to be the best. I could just do what I liked to do in sports. (R2)

It is interesting that this athlete then pursued his education to become a physical education teacher. According to him, studying in this field had a positive impact on his

career because it enabled him to expand his knowledge base and write a thesis on the biomechanical aspects of pushing in bobsledding, the sport in which he eventually became an expert.

I was very interested in physical education. That was the reason I completed these studies afterwards in Zurich between the age of 20 to 24. I was so impressed with these people's knowledge about teaching the right movement techniques with video analyzing. At this time, I never thought about competing at the Olympic level. That was not even a dream, not even a thought. I just wanted to go on in the field of physical education and sport sciences. I went there to study for four years. The first two years, I took physical education and the last two years, I wrote a thesis.

(R2)

Two other athletes discussed how their educational environment provided them with opportunities to pursue their sport of excellence during the specializing years. For one athlete, it was particularly significant for her to get away from home for both sport-related and personal reasons.

After I graduated from U of T, I had a bit of a decision to make because I had done business undergrad and then I wanted to take sports administration at a graduate level. There weren't a lot of places that offered it but the University of New Brunswick was one place that did. I knew hockey would be totally different down there because there was only one senior team and there would be no league. In Toronto, we had a six team league. When I made the decision to go to New Brunswick, I was the

number one goalie on the team down there. I knew from playing against them that the team had potential and it was just a matter of developing it. Also, my mom had passed away in July of '92 so I think it was probably good for me to get a fresh start on the ice and off the ice, and get the chance to get playing time at Nationals. (C6)

I studied phys-ed and my marks were always up there but it was a busy year. It was hectic. I was a full-time student and I was still playing badminton competitively. So I was away on weekends a lot with badminton and then I had hockey and school. (R4)

In addition to human resources, other factors came into play at this stage of the athletes' career that affected their development. These factors pertained to financial resources, as well as the orientation and structure of the environment in which they practiced their sport. Once again, enjoyment, success, engaging in a variety of activities, and dropping out were issues raised by the athletes. Employment was another factor that was brought up.

1.3.1.1.6. Financial resources

Two athletes discussed their lack of financial resources at this stage of their career. One athlete revealed how he relied on his club to train in track and field because his parents did not have sufficient monetary resources to support him. Another athlete explained how his career was almost terminated because he could not afford to attend important ski races.

When I was 16, I trained with a good club in a big city because they had good trainers and they organized to pick me up. My parents didn't drive

me back and forth. They didn't have the time nor the money to do that.

They were involved in their life and kept life going for four kids. (R2)

My career almost ended because it was too expensive to be on the provincial team. I didn't have the money nor did my parents at that time.

So I decided not to be part of the provincial team and to only do one or two races. My career was almost finished up until some people got injured on the team and there were spots available. These spots were not offered to me even if I was better than others because they assumed I didn't have money to go to races. So we complained and I got a spot on the team after that. (C5)

1.3.1.1.7. Enjoyment

Regardless of certain constraints, such as a lack of financial resources, most athletes had fun during this stage of development. They had a passion for their sport and this motivated them to do the repetitive training and attend numerous competitions. Their enjoyment was also accompanied by success, just like in the sampling years. The following citations illustrate how fun, motivation, and success appeared to be linked.

For the first seven years, I went through different age categories, two years in each category, and what kept me going was the group of skaters in there. We were like a family and it was fun. We got to travel around and as we got older, we would travel to other cities so that was a thrill. Again, I did well growing up and it was fun. Some kids thrive on the training and the results. I was the sort of kid who still smiled even if I had a bad race. I

couldn't wait to go on the road and have a fun bus trip. That was what motivated me and if it hadn't, I wouldn't be skating right now. (C1)

There was nothing I would have rather done than take 500 slapshots a day or practice skating. It was always fun, it was enjoyable. I started at such a young age and hockey was always fun and a way to meet other people. I felt like I was good at it too so I enjoyed that. I knew that by doing the repetition, I was only going to make myself better and I would have that shot at the Olympic dream that I had. So all of those factors put together just made it something that I just really enjoyed to do. (C4)

When we do something we love to do, we grow and we develop extremely fast as well. We are happy. We work and it's not a problem, it's not a burden. It has never been a goal of mine to make money out of skiing and it still isn't my goal. I ski because I love it. If I do well in my races, I know I will have bonuses but it's never about that. When I was really young, I once tried to think of this to motivate myself and I hit the fence. I understood right away that it wasn't about that. Every time I race, it's to perform. (C5)

1.3.1.1.8. Drop-out

It is interesting that two athletes experienced a lack of enjoyment in their sport at this stage and this led one of them to temporarily drop out of her sport. She revealed that she eventually realized that although having fun is important, training requires hard work and is therefore not always enjoyable. She had to accept and learn how to positively cope with this.

I actually quit for about 9 months because I realized, "What am I doing? I'm missing out on my childhood, I can't have any fun anymore." I was 14 when I quit, and I was close to 15 when I started again. So when I quit, obviously the fun was gone. That's why I quit. And then, when I returned to the pool, I had matured. I realized that yes it has to be fun, yes I have to enjoy it, but yet I also have to make the sacrifice and sometimes it's not going to be fun. So I came to the conclusion that there are going to be days when I hate it, that I have to get passed those days, and I have to look at the positive things and just keep moving on from that. (R1)

The following athlete did not enjoy the position he occupied on his team and this eventually led him to switch positions to become a driver.

I just wanted to stop bobsledding because I felt like a slave as a brakeman and used by the system. (R2)

1.3.1.1.9. Variety

Most athletes not only enjoyed the sport in which they excelled, they also took pleasure from participating in other sports as well, although perhaps not as intensely or in as many sports as in the sampling years. Having a variety of activities in their schedule seemed to be an important factor because it kept them motivated and helped them to further develop their mental and physical attributes.

I think some kids definitely trained harder than others. I was into it but I was also into other sports like soccer, which is training in my mind. It's also sort of an escape. The variety for me was really important. Some kids just have to keep focused on one thing but I needed variety. (C1)

I also picked a lot of sports then; volleyball, basketball, track and field, and a little swimming because I liked to have a range of activities in sport. I think most of the people in track and field focus very early on track and field and nothing else. They used to say, "If I play volleyball or basketball over lunch, I will be too tired to train in the evening." I told them, "That's possible but it's just fun to do volleyball and basketball over lunch." I benefited from playing volleyball and basketball because I had to have short reaction times. In sports, the best people are those who move very fast and have good reaction time and a good awareness of what's going on around them. It was just a good feeling to learn new things. (R2)

I played a lot of school sports as well. I could say that I trained 30 hours a week because I played basketball and volleyball just as much as I played hockey just because I managed to do all three. But I trained for hockey maybe 20 hours a week at that point. (C4)

1.3.1.1.10. Employment

For one athlete, employment added to her variety of activities. She taught in hockey schools and this contributed to her development. It is not clear if the other athletes were also working at this stage because they did not mention it.

Ever since 1990, I've been going to hockey schools and teaching them in BC and Alberta just to keep up with my training and also to help out the younger girls around. I taught individual skills in on-ice and off-ice sessions and these were usually one-week hockey schools in the summer or the off-season. I usually did about four of them in the summer so that

took up most of my time. There was not much time left between the hockey season and the summer camps. (C4)

In sum, several contextual factors were important for the athletes' development during the specializing years. Parents and coaches played a significant role for most athletes. Enjoyment and variety also appeared to be of importance at this stage, just like in the previous one. The athletes benefited from their school environment in which they played different sports and interacted with friends, coaches, and teachers.

1.3.1.2. Personal Characteristics

In addition to contextual factors, certain personal characteristics contributed to the athletes' growth at this stage. The athletes noted various personality traits and psychological skills that they acquired with the help of parents and coaches.

1.3.1.2.1. Self-confidence

The importance of self-confidence was discussed by one particular hockey player. She highlighted the fact that she believed in her ability to perform regardless of the situation in which she found herself because she knew that if she worked hard enough, she could accomplish anything she wanted to do. Her parents and coaches played an instrumental role in nurturing her confidence over the years.

I always believed in myself through the whole camp right up until the night of the final cuts. I had confidence and played with confidence so it didn't really give them a reason to cut me. I believed in myself enough to know that if I played well, I was going to make the team. And that just came with the years of playing with the boys and realizing that when I played, I was one of the better players and if I wasn't, I could work hard

enough so I could be. I think that a big part of my confidence came from my parents and coaches and just from playing for myself too. (C4)

1.3.1.2.2. Taking risks

Another characteristic that was highlighted by three of the athletes was their ability to take risks and their desire to try new things in order to continuously challenge themselves. This was perhaps associated with their need to experience change throughout their career. The following citations illustrate this finding:

You have to take risks in life and the biggest risk I took was going out to Calgary when I was 17. I felt I really needed a change and that was the best risk I took! (R1)

I did five or six runs in those four days just to learn what it was like to be in the sled, to push and load, and to be part of the team. I was involved in a totally new field and I was nervous just like others are when they do a sport for the first time, especially if it's a dangerous one. (R2)

In the 1993-94 season, I took a break from playing with the girls and went back to the boys to play bantam triple A just because I felt I needed to be challenged more with the boys. I wasn't getting that with the girls. So I took that year off and went back to the boys and played a year. (C4)

1.3.1.2.3. Significant improvements

In addition to the previous characteristics, two hockey players discussed their ability to learn. They revealed that they experienced significant improvements during the specializing years.

I had the biggest learning curve of my entire hockey career when I was 14 and 15. I was very serious once I knew that I could play on the national team and I knew what I wanted to do. Going back to play with the guys and sticking with their off-season training program was a big factor. (C4)

My puck handling improved a lot over those couple of years because there were a lot of times when there was no one to pass it to. I remember my parents came and saw a game and said, "We never saw you handle the puck so much." And I said, "Well, I sort of have to!" (R4)

1.3.1.2.4. Perceptions of being "special"

In an attempt to further investigate the athletes' personal characteristics, they were asked to discuss the time when they knew they were special and had something to offer in their sport. Following were some of their responses:

I think it was when I took that class. At the end, we had a tournament with the guys and I had three matches with guys my own weight and I won one. The other match was pretty close, it was something like 6-4, and the other one was 8-2. So I did well in the tournament against males who were probably stronger. So then I thought, "If I can do well against the guys, I could do well against women and it would be more fair." (C2)

I think in my junior year in high school was when I thought I could be really good at it. I made a lot of breakthroughs and once I was offered a scholarship to college, I understood that being offered a scholarship to a division one school is a great accomplishment by an athlete. That is when I realized that I had a lot of potential. (C3)

I never thought about this. I was winning races on a regular basis and I had good results but I was always having fun. I didn't think about going to the Olympics. I didn't think it was even conceivable to go there. Since I didn't have any pressure, I always tried to go up the ladder, step by step. Therefore, my goal after competing in regional races was to compete in provincial races. I was successful at that level so I was asked to be part of the provincial team. (C5)

In sum, the athletes manifested certain characteristics that helped shape their character to eventually perform at a high-level in their sport. Even at this stage, they were confident and believed that they had potential to succeed in their sport. Their courage to take risks in order to do what was most appropriate to improve their performance was remarkable.

1.3.1.3. Training

In addition to sharing personal characteristics that emerged during the specializing years, the athletes discussed their training environment. Training at this level was much more focused and arduous than in the sampling years. It included physical, mental, technical, and tactical components. The next section will focus on physical training.

1.3.1.3.1. Physical training

Physical training was more structured and intense at this stage of the athletes' career. One athlete mentioned that practices were so demanding that sometimes she feared going to them. Another reported that he was so driven that he always did more than what was asked of him. The following citations illustrate how serious training became:

I think the element there again was just being pushed and pushed to see how much I could actually take. I used to go home and think, "How am I going to get through practice tomorrow?" I was almost afraid to go to practice because the routines I was doing were so difficult. I was afraid I was going to pass out during them and that sort of thing. So it really was a big big jump but I think it made me improve that much more because I was forced to keep up with the girls who had that much more experience than me and who were that much better than me at the time. (R1)

Our coach would make us do these exercises but I was way ahead. I did my home work. When it was time to do 50 sit-ups, I would do 500 because for me, it was better. I was able to do them so I wouldn't hesitate. Also, I would feel bad if I missed a workout. When I went out with my friends and came home at three in the morning, I would do my exercises then because I felt guilty of not doing them during the day. I just had to do them. I was a maniac! (C5)

Weight training became an important part of the routine of many athletes at this level. It was perceived as an integral component of their workload.

When I started wrestling, I started weight training. I had done it before but just casually. Then my coach put me on a program and he took me to the gym. We would work out together. He basically taught me how to weight train and I would do that about three times a week. (C2)

I started weight training in high school and it played a large part in improving my performance right through college. I really started to push

myself in training and started to work a lot harder and started to feel pain in my workouts and it has been like that ever since. (C3)

Training definitely shifted into a more high performance serious state. I remember I got the training program for the Canada Games team and there were weights and running like three or four times a week. It was a set program and it wasn't like I didn't know how to do it, it was just funny because it was a scheduled thing. I used to do it all the time anyway but it really shifted into a higher gear at that point. (C4)

1.3.1.3.2. Mental training

The athletes developed certain mental abilities that helped them during training and competition. It is important to note that they did not necessarily engage in formal and structured mental training sessions to develop these abilities. In certain instances they did, however, for the most part, mental skills were developed during daily activities and in conjunction with other training exercises. One skill that was developed through training at this level was mental toughness. The athletes became extremely mentally tough, which helped them to persevere through difficult workouts, competitions, and debilitating injuries:

I would say that the next phase was extremely difficult but very rewarding because I was pushed so hard at this club with the hours of training and the things they had us do. It really tested my mental toughness and my physical toughness and that's probably where I grew and realized that, "Wow, I am pretty good. I can do this! And if I can do this, then I can get to that next level." And so that's what kept me going. (R1)

I remember the season when I was 14 going on 15. It was probably the most physically excruciating season of my whole career compared to this year because I was one of the smallest players and I was back playing contact again, which I had not played for about four years. I remember coming home and just being bruised and battered. I never wanted to complain that I was injured because I didn't want anyone to say, "She's a wimp and she can't handle it." I separated my shoulder once and I just thought, "God, I have to keep playing." I really learned how much pain my body could handle. (C4)

I am sensitive to the point that when my body starts to ache, I stop. It's a sign. I tell myself, "My body is not going to lie to me." For sure, sometimes I have to push it. There are races where I skied and I wasn't even able to walk because my heels ached so much. But you condition yourself, it's the mental part that does this. You can get to a point where you can completely forget your pain by being well-focused. This comes from a desire to do well and anybody can do it. (C5)

Another athlete discussed specific goals that she set for herself throughout her career. These guided her pursuits and motivated her to make it to the top of her sport.

My goal had always been to play the game at as high a level as I could. So in the late 80's when I was going through high school, my goal was to make it to nationals at that point. Then in '89-90, when I started university and started playing in the senior AAA, I went to my first nationals, so being part of the national team became my new goal. (C6)

Visualization was another skill that was developed and utilized by the athletes to help their performance. One athlete discussed how he learned this skill by himself and practiced it in the most interesting settings.

I have always been good at doing visualization. I used it a lot to practice my runs and prepare for my performances too. I learned this by myself. When I was young, we used to have family gatherings with my uncles and aunts and I was always so bored. So when we sat at the table to eat, I would imagine the jug of milk starting to fly and landing on top of their heads. I learned how to visualize from every possible position. I was the jug of milk or the camera. I could visualize from the top, the bottom, in color, everything. I would do it naturally so it wasn't hard for me to make the transition to visualize my races. I wouldn't stop and tell myself, "Ok, I will visualize now" but I would walk on the road behind here and imagine different scenarios and situations in which I could find myself during competitions. (C5)

Another athlete reported how he developed an acute sense of awareness for details when he trained in his sport. The use of all his senses was extremely important, particularly since he faced dangerous situations on daily basis.

Each track had so many secrets and I had to explore all these secrets. Each corner had some things that I could do better. I could shorten the line or drive it with more feeling so that I could take the speed out of the curve and not destroy it. I had to use all of my senses to know when I was

losing speed. It was a lot about feelings and storing these feelings to be able to reproduce them under pressure. (R2)

1.3.1.3.3. Technical training

The athletes discussed not only physical and mental components of training but also technical aspects that were essential to improve their performance. Developing sound technical skills appeared to be crucial at this stage.

There was a variety of ways they could run the practice. In a two-hour practice, I usually warmed up for 20 minutes. Then I did techniques, situation drills, and then wrestled for maybe 40 minutes. Then for rest of the practice, I would wrestle with different people. I took breaks, like I wrestled for three minutes, took a two or three minute break, and then wrestled for three. We always scrimmaged at the end. (C2)

Technically, if I was working on anything, it was just swimming and doing a lot of yardage, just doing a lot of what I call "grunt work." We did work on some stroke technique. That's always really important. At that age, I think that a lot of what I was doing came naturally but I did have some help with my stroke from my coach and other swimmers. It was really just a stage of learning where I made sure that I enjoyed the sport and had a good feel for the water, and made sure I didn't develop any real bad habits. I don't think you want kids in any sport to turn 14 or 15 and start puberty with a whole lot of bad habits so that was certainly a time to get rid of any of those. (R3)

One athlete revealed that he developed a particular skiing technique without the help of coaches. He had to be innovative, clever, and perseverant in order to reach a high level in his sport.

I developed a skiing technique that I adapted to the conditions here in Canada because we had the worse conditions you could imagine; hard artificial snow that was difficult to ski on. We couldn't have the same technique as the French who skied in powder snow, nor the technique of the Americans who were extremely stiff. I combined a type of technique that was based in part on the style of the Americans and gave birth to a new style of skiing. It is very fluid and I am always in contact with the snow to minimize shocks. I developed this without the help of a coach and this is what led to my eventual success. (C5)

1.3.1.3.4. Tactical training

A few athletes discussed tactical training, which also appeared to be an integral component of their schedule at this stage.

When I was in Edmonton, the training wasn't as physically demanding. It was more learning the techniques and understanding the sport and learning tactics and things like that. (C2)

I definitely learned a lot about team play in those couple of years. Growing with the boys, I was often one of the better players so it was easy to carry the puck through everybody and not worry about the four other players on the ice. So team play was a big factor and it was really drilled

into my head at that age. I was learning about tactical play on the ice and stuff like that. So those first few years were a huge learning curve. (C4)

1.3.1.3.5. Orientation

Whether the athletes engaged in physical, mental, technical or tactical training, it was apparent that they continuously aimed to improve their performance. The following citations illustrate how the athletes were driven to learn and refine their skills and how they had to invest extensive mental and physical energy to perform their training activities.

When I started to compete in bobsledding at 21, I just pushed the sled and learned all of these skills. When I started to drive at 24, I was older and more mature but my drive was always to learn and learn because it's such a complicated sport. (R2)

The swimming part probably required the most effort because I wasn't lifting weights at that point. The hardest would have been just doing the yardage, the repetition. I'm a real technical swimmer. I like thinking a lot through all my practices and things like that. I'm not sure that at that age I thought that much or was educated enough to think about all the details so it was a challenge to do all those yards without the knowledge base behind me. (R3)

The athletes were asked if the effortful practice in which they engaged was enjoyable. All of the athletes who discussed this issue said that at this level, it was enjoyable. When asked if they enjoyed the process of training or the results of this training process, one athlete responded that it was both.

A bit of both, but initially it was the process. It was like, "I can almost take a slapshot and if I work just a little bit harder, I will be able to take it." It was that personal pride and satisfaction of being able to do it that pushed me at the beginning. Then when I found out that it was an Olympic sport and the national team was there, that's what I wanted to do and that's what drew me to keep working on those skills. (C4)

Another athlete indicated that at this stage, there was nothing in particular about her training that significantly helped to improve her performance, although it was obvious from her response that she invested several hours of training for both hockey and badminton.

There wasn't anything in particular that helped me improve because once again, I was just playing to play. I think I did do some weights at that point but nothing major. I was a full time student and I was also training for badminton because I was going to the Canada Game. I had a specific training program for that.

1.3.1.3.6. Schedule

As previously mentioned in the Sampling Years section, the athletes discussed their training schedule. Table 11 in Appendix L outlines the hours they trained at all levels of their career. During the specializing years, the athletes trained between 6 and 24 hours for their sport of excellence. In addition to this, they spent approximately three to seven hours lifting weights or doing other dry-land activities such as sit-ups and push-ups. The total number of hours they trained at this stage was substantially more than the hours they trained during the sampling years, at least for most athletes. All of them still

practiced a few other sports they enjoyed just to keep some variety in their schedule and they generally considered this as training.

1.3.1.3.7. Constraints

It is interesting to note that one athlete discussed a training constraint that was not an issue during the previous stage. The following citation shows how she had to adapt her schedule and training habits in order to conform to new training conditions after she moved to go to school.

UNB was in Fredericton so we had a two hour drive every weekend for hockey and two of us from Fredericton would stay overnight at one of my teammate's place. A couple of girls from St. John would stay at our coach's house and a few people who were in Moncton would billet the out of towners. That was sort of how it worked. It was unheard of for me to have to drive that far to play hockey, growing up the way I had. But I guess you have to do what you have to do. So that was weekends. Also, we were only on the ice two days of the week and I was used to being on almost every day so I had to find ice in Fredericton through the week. For the first year, I played men's intramurals at UNB and then I went to some midget triple A and some high school practices. (C6)

In sum, results of the analysis revealed that the athletes engaged in more hours of training during the specializing years. Although they started to focus more on their sport of excellence, they still played a few other sports that appeared to motivate them and contribute to their overall athletic development. Their training included physical, mental, technical, and tactical activities, although technical training appeared to be more

predominant. The athletes revealed that training was more effortful but it was still very much enjoyable.

1.3.1.4. Competition

Competition was another theme that emerged from the analysis. Based on the athletes' reports, it was more prevalent during the specializing years than in the sampling years. The athletes discussed various events they attended and personal performance outcomes.

1.3.1.4.1. Performance Outcomes

Although all of the athletes experienced success at this level, they also experienced difficulties, setbacks, and even failures. The following citations illustrate the athletes' accomplishments at this stage of their career:

At the end of my second year, they decided that Canada was going to send girls to the World Championships just to see how we would do. So we had our National Championships in the summer and then I was selected to be one of the three girls to go to World's. So that summer I went to Norway and I came in second. There were only six girls represented in the 70kg weight class but second is still pretty good. (C2)

By the time I was a senior, I was the top 400m hurdler in the nation among high school hurdlers. (C3)

At age 12, I went to the Canada Winter Games with team Alberta and ended up beating team Saskatchewan and winning the gold medal at that competition. So for me, it was the first big event and I think the turning point in my career in terms of playing hockey with women because I had

never heard of it before growing up in my home town. I had always just played with the boys so I thought at one point that I would grow up and maybe go play hockey on a scholarship, get an education and that would be it. I didn't really think I would have the opportunity to go to the Olympics. (C4)

The next citations demonstrate how the road to the Olympics was not always paved with success. According to the athletes, they did not always win in competition nor did they always have opportunities to display their skills and perform.

There were some ups and downs in those four years. On the Aeros team, we had two strong goalies. Two of the four years I played, I played in the final game at provincials but when it came to Nationals, I found myself on the bench for the National Championship game 3 years in a row. I felt like I proved myself at provincials, but then we got to Nationals and the other goalie played the final game. I sort of felt like there was a road block there for trying to make the National team. (C6)

I was not very successful then at the national level. I was tenth or fifteenth, which is not that bad. (R2)

In our second year, we actually beat Dalhousie to go to Nationals. We had added more players who had played before and we went to Nationals. We got blown out pretty much and our next year we went to Nationals and it was the same thing but we had fun! (R4)

Two athletes discussed the pressure they experienced during competition. One of them shared his frustrations about his federation and the position he occupied on his team. Another talked about the pressure he felt once he started competing at a high level due to his inexperience and competitors.

As a brakeman, I was sometimes like a slave. There was the pilot and my Federation and I felt used sometimes in that setting. I was just a number and I knew they would take someone else if I didn't do well. (R2)

When I was on the provincial team, I went to North-American continental races, and I didn't do well. The first year, I couldn't deal with the stress of skiing against competitors from overseas because I thought they were superior to me. After one particular training camp, I was invited to go to World Cup races and it was a catastrophe because I was skiing against my idols that I had watched on t.v. when I was young. I was skiing on the same runs as them and it was too much for me. I would move to the side of the trail to make sure I wasn't in their way, up until a French skier stopped and told me, "Listen, there is no need to get off the trail. You are one of us, you are an excellent skier." I was so thrilled. The next race I came in 26th and the next one 54th. I had a terrible run and made a mistake but it's because I didn't have the experience to deal with the pressure. After the race, a competitor told me "If you wouldn't have made that mistake, you would have finished in the top five." I was blown away!

To summarize this section, it is evident that although the athletes experienced success at this level, they also faced setbacks and failures, which were inevitably part of

their learning process. Furthermore, pressure was a factor for a few athletes who felt inexperienced or intimidated by other competitors or organizations.

Before discussing the athletes' transition to the investment years, the parents' and coaches' perceptions regarding topics addressed in the specializing years will be presented.

1.3.2. Parents / Coaches

The parents shared their thoughts about the context within which their children developed at this stage. They also provided some information on their personal characteristics, and a few of them discussed what they did in training and competition. The next section will focus on contextual factors.

1.3.2.1. Context

The parents talked about the support they offered their children. They also talked about influential people such as their coaches, friends, and other athletes. Moreover, they discussed the importance and priority of school in their children's lives.

1.3.2.1.1. Parental support

The parents were supportive of what their children chose to do during the specializing years. They never forced them to do anything they did not want to do. They said that the happiness of their children was more important than the outcome of their performances.

At one point when he was about 12, he said, "Well, I'm going to get through this year, but then I think I'm going to take a year off." And I said, "Ok, fine, if you want to." But then that year never came, he never mentioned it again. I honestly don't feel like either his dad or I pushed him

and said, "This is something you have to do and if you quit, we're going to disown you or anything like that." (PR3)

One of the reasons he succeeded is that he had an ideal environment. We always encouraged him without ever forcing him. When he went to a competition, we always told him to go have fun. It didn't matter to us what place he came in. If he won, well that was great. (PC5a)

The next two mothers also revealed that they were supportive. They drove their children to practices and one of them helped out at races, however, they did not get involved with coaches nor interfered with anything they did.

I was there for her but I wasn't physically there at the practices. I didn't believe in being a "pool mom" because there are too many interfering parents who get involved. "How come my daughter does this or can't do that?" and I didn't want to do any of that. I'd seen it too much in other sports too. So I would drive them to the pool, which is way at the east end of the city from here, and then I would leave them there because their practice was around four hours long. I'd come home and then go back to get them again after practice. (PR1)

I was never a parent who got into what the coaches were doing. I would be on the sidelines and if they needed my help with concessions or timing or whatever, I would be happy to help. I kept up with his times but I wasn't a parent who kept up with specifics as far as how they were training and what sets they were doing and all that. That wasn't my thing. (PR3)

In the next two citations, other parents shared how in addition to providing moral support, they got involved in administrative tasks to help with the team and organization.

There was no club for acrobatic skiing and in order for the sport to survive, we needed one so all the parents got together and we built a team. We were in charge of the organization. We loved to take care of all the kids. It wasn't hard. We weren't teachers for nothing! (PC5b)

When she started off when she was young, I played a direct role as I was her coach and I used to take her skating and all of this. As she moved on, other people coached her. I played more of a supportive role then. I made sure that I patted her on the back and said, "Good game," even though sometimes she may have been hurting. I watched out for her because there were still times when people were out to get her basically. We would always be there for every game to support her and she knew that. I think that helped her. I was always a resource person in case they needed some help. I did whatever needed to be done for the team, whether it was being an assistant coach or running the clock or the score board or whatever. And fundraising, oh Lord! But it had to be done so we did all of that too and helped out there. (PC4)

The parents' role at this level also included providing their children with financial support. This required them to make huge sacrifices and for some, trying to make ends meet was challenging. Through fundraising and external assistance, they managed to work things out.

We weren't millionaires and we had two children involved at a high level. We wanted both of them to have the same things. The worst was when they were both competing. Eventually we got help. Sometimes we would ask ourselves, "How will we be able to make ends meet?" But it wasn't that bad. (PC5b)

We made huge financial sacrifices but we never minded. Traveling was enormous. I think we put at least two vehicles in a vehicle graveyard! We put miles on them until they dropped and then got something else. Hotels, motels, food, just slurpies after games, you lose track! I couldn't even imagine how many of those we bought. I think back and wonder what we would be doing if we weren't there. Well, probably nothing that was as much fun anyway. It was a tremendous amount. The hockey fees we had to pay, the equipment, everything was just so expensive. We did some serious fundraising so it was money and time. But it was all worth it in the long run. (PC4)

The following father highlighted the fact that his daughter did not have to work and worry about finances because they took care of that for her. They provided the environment she needed to develop her skills and concentrate on her sport.

It was not necessary for her to go out and get a job because financially, she had a bedroom and everything else at home. She didn't have to worry about that. But financial worries are why many people can't pull stakes and go. She had a stable home environment and atmosphere where she could work hard and develop her skills. (PC6)

1.3.2.1.2. Coaches

The parents reported that their children had access to good coaches not only in the sampling years but also in the specializing years. In the next citation, a parent shared how one coach was instrumental in his daughter's life because he believed in her and respected her as a female player on a boys' hockey team.

The coach she had then in Pee-Wee coached her for a year and he was very good with her. He really believed in her. That was a hard time because she was still playing with boys and the difference was starting to show up now. She would get changed in the skate room or some other room and then come in for the talks. There was a lot of pressure put on him. I admire him for standing up to some of the people. Some people were saying, "She's a girl. She's taking a boy's spot." She was probably the best player! But no, he said, "That's how it's going to be." (PC4)

In the following citations, a coach and three parents, one of which coached his son, discussed how coaches at this level noticed that the participants had talent and potential to excel in their sport. In two cases, this influenced them to eventually move to another city to train at a high level.

The coaches said she was physically strong and she just had natural ability. They said that all my children did but because she was at a younger age and had that much more time to develop into a synchronized swimmer, they felt that she had a chance of going really far. When she was in the middle of tenth grade, her coach had a meeting with me and said, "I think she can be the best in the world if that's what she'd like to do." She

also said, "I've taken her as far as I can and I think she should go to Calgary to train." (PR1)

By the time he was in junior high school, I knew he was going to be a State champion. I could tell by his technique and the way he was dedicated to it. He won the State Championship his junior year and his senior year and he ran the best time in the United States. But even then, I didn't know he would be a real superstar. (PC3)

We had gone to Calgary earlier in the Spring so that she could try out for team Alberta for the Canada Winter Games. The current national team coach actually saw her right there and said, "Will you come and play for me in Calgary" So we said, "Ok, we'll see." We hadn't committed to moving yet but we ended up going for it. She played for her every year since she's been here. She is a good technical and all-around coach and I think she definitely had a big influence on her. (PC4)

Her first wrestling coach is a very good friend of mine. I actually wrestled with him at the University of Calgary on the Varsity team. He kind of took her from the beginning and guided her all along the way. She had taken the university wrestling course and the head coach approached her about trying it because she had actually put one of the guys in the class on his back and pinned him. She really showed terrific promise. (CC2)

1.3.2.1.3. Friends

The athletes mentioned during their interviews that their friends played a significant role in their lives. Two parents mentioned that their daughters had good friends who supported them and motivated them to persevere in their sport. They developed strong relationships with their friends as a result of sharing common interests in sports and other areas of their life.

Any number of friends she had were sports minded. I think that had a big influence on her. She met some good people and they enjoyed doing a lot of the same things so in that sense, they helped her stay with it and it was good. (PC4)

She had a lot of friends who were with her all the way and I'm sure they encouraged her. Her friends are very important to her and they're all very nice people. They certainly helped her. (PR4)

1.3.2.1.4. Competitors

Many athletes learned from other athletes in their environment by observing them during competition. In the next citation, one father reiterated what his son said about studying the technique of French skiers by watching endless hours of videotapes, and learning on his own due to a lack of coaches.

He spent hours watching videotapes of French skiers and studying their technique because they were a bit ahead of us. He would watch them in slow motion and then on the weekends, he would practice these techniques on the moguls. The next week, he would focus on something else. He

learned everything on his own because there were no coaches for freestyle skiing at the time. (PC5a)

The following father confirmed the fact that his son was a student of his sport. He added that his son modeled himself after a famous hurdler and learned everything he could about him.

He studied this famous hurdler. He read his books, watched his tapes on t.v. and he tried to pattern himself somewhat after him. (PC3)

1.3.2.1.5. School

All of the parents except PC5a and PC5b felt that school was extremely important and came first in their children's lives. It is noteworthy that those athletes whose parents reinforced school excelled in both school and their sport. They learned to organize their time to be able to manage both.

I fully believe that sports should be in schools. I think students should have good grades and if they are poor students they should not be allowed to play sports. I do not believe in pushing kids through just because they're good athletes. I think school offers the opportunity to a lot of kids who otherwise would not have the chance to play club sports, and of course, there are also scholarships. But I think kids need to realize that they need to have an education too. (PR3)

School is not as important as sports, it's more important than sports. I've always taught my four children that. Your school work comes first. If you can't deal with that, you can't deal with sports and other things in life. (PC3)

In her case, there was school and hockey, and school came first. She was a scholarship student throughout high school and six years of university so she had her life well organized to do both. (PC6)

She kept up her school work. We were always pretty strict about that but she was a good student and had good time management skills. She would get her homework done and then she would head out to play hockey or whatever sport she was doing. I think she learned a lot. She got a lot out of the sport, not just recognition but good time management skills as well. (PC4)

In sum, the parents reported that they gave their children both moral and financial support during the specializing years. In some instances, they even helped perform administrative tasks. They perceived their children's coaches to be competent and in some instances they confirmed that they were responsible for detecting their children's talent and potential to excel at a high level. Other important contextual factors at this level included friends, other athletes, and school.

1.3.2.2. Personal Characteristics

Information that pertained to the athletes' personal characteristics during the specializing years was not abundant. One parent did talk about his son's determination and willingness to take risks and succeed. This can be seen in the following citation.

He went to the Senior National Championships out west all by himself with an injured shoulder. He had never taken a plane before and he didn't speak one word of English. Don't ask us how he got there but he managed. Once he was there, there was a medical doctor who bandaged up his

shoulder so it wouldn't move and he made the top 16 for the final. It was the first time that a junior made it to finals in a senior competition. (PC5a)

The aforementioned father also corroborated his son's observation that he loved his sport and had a strong work ethic.

He loved it so much when we went skiing up north. He was the first one on the lift in the morning and the last one to ski down in the evening. But that wasn't enough. When the hill closed, he would come home, have a bite to eat and go back with a shovel. He would walk up the hill and get the moguls ready for the next day. He waited for the grooming machine to go by and then he would carve his moguls. (PC5a)

1.3.2.3. Training

As previously mentioned, the athletes invested several hours into training at this level. The parents reiterated some of the practice activities in which their children engaged. They observed that their children's determination and creativity significantly contributed to the development of their skills.

She put up a volleyball net at home and she kept practicing and practicing. In grade eleven she made the team so she was tickled pink. Through perseverance, she would never give up. If she had something in mind, she just kept doing it until she did it. (PC2)

He would run on rocks along the gulf behind our house. He would train that way and really work out his legs because the rocks were uneven and scattered all over the place. He loved nature so it was ideal for him. We also bought him and our daughter a trampoline and they played so much

on that! At one point, he invented techniques on the trampoline that were useful in his sport. Now, most national team athletes train on the trampoline and do these techniques. We are proud that he invented these moves. (PC5a)

She needed to be on the ice every day and here in Toronto she was literally playing hockey seven days a week. Then she went to UNB for academic reasons and drove two hundred miles on the weekends to play women's hockey in Moncton. She was missing being on the ice every day so she asked a men's team if she could practice with them and they said, "Sure." So she's had seven or eight years on ice every year. (PC6)

One father reported that his son's training changed at this level when he decided to specialize in hurdles. He noted that he was serious, dedicated and he practiced several hours to develop his technique.

The training started to change in junior high. He was getting so frustrated with not winning medals and he really wanted to quit. So I suggested to him to try the hurdles. Most athletes don't like to run hurdles because you hit one and you fall. You go down. They say you have to be crazy to run the hurdles! But that didn't bother him. He worked at it and practiced over and over again. I literally had to pull him off the track to get him to stop practicing. He was dedicated. He had fairly good technique. Then when he had a growth spurt in high school and got the height, the build, and the musculature, he just took off. That's when he began to win the hurdles. (PC3)

In sum, training appeared to be more intense and focused during the specializing years in comparison to the sampling years. Dedication, determination, and in some cases, creativity proved to be important characteristics for athletes to possess to endure long hours of training and improve performance.

1.3.2.4. Competition

Although competition was more prevalent during the specializing years, the parents did not provide too much information on this theme. The coaches did not either because as previously mentioned, they mainly discussed the later years. One father mentioned that his daughter was successful in competition at this stage. He is convinced that her success and recognition motivated her and led her to believe that she could excel at a high level.

I think what didn't hurt either was getting recognition at a young age. She was on the Alberta Winter Games team when she was 12 years old and they won the Games. She scored the winning goal and all of sudden people started to say, "Wow, she can play!" That helps because all of a sudden she started thinking about being an elite athlete. She also played Ban-Tam AA and was a good player in town here with the boys. That certainly isn't done very often by girls. (PC4)

In sum, the parents played an important role during the specializing years. They provided the love, encouragement, and financial support their children required to remain involved in their sport. Training was more intense but their children were determined to invest the hours and work hard to do well. Of interest is that school remained a priority

regardless of their level of involvement in sports. The transition of the athletes from the specializing to the sampling years will be discussed next.

1.3.3. Transition from Specializing to Investment Years

The athletes reached the investment years when they chose to invest most of their time and energy into one sport. Their transition to this stage was reflected in the citations presented in table 7. These citations indicate that different events marked the athletes' transition into the stage of investment. For some athletes, their transition was characterized by moving to another city or joining a new club as a result of a coach, a need for a change, or making the National team. Two of the athletes changed schools. They also realized that they had potential to go far and chose to focus on their sport and train at a higher level. The section following the table of citations will present the results that pertained to the investment years.

Table 7

Citations Reflecting the Athletes' Transition from the Specializing to Investment Years

Athlete	Citation
C1	<i>I don't think I let myself think that I was good until I made the National team and moved to Calgary. Athletes try out for the National team when they go to Nationals but it's just a certain number who make the team. I was 17 and that was still quite early to make the team but I was done high school at that age and started University.</i>
C2	<i>Half way through the year, I decided to move to Calgary and I've been training there ever since. I moved because I had graduated from university and I just wanted a change. My coach had moved to Calgary so that was part of it and my boyfriend and sister were also in Calgary. I think it was a good move.</i>

Table 7 (continued)

Athlete	Citation
C3	<i>I attended Georgia Tech in '93 and that is when my training really started to get difficult. I progressed just about every single year and ran a little faster.</i>
C4	<i>In 1994, I was 15 and I had a tryout with the National team. I ended up making the team and played at the 1994 World Championships and we won a gold medal. I thought I could also play volleyball but I was pretty much just burnt out from training so much so I gave it up. School sports were out at that time.</i>
C5	<i>I didn't stay on the development team for even a couple of months. I was upgraded on the National team right away. The World Championships were being held the following week and I wasn't supposed to go. I wasn't even supposed to do World Cup races that year. But I ended up going to the World Championships because I had good enough results. I finished 12th and got the best results among Canadians.</i>
C6	<i>I found out in November of 1993 that I was invited to the January 1994 final National team camp and knew that that was the chance I was hoping for. It was just, "Get me to that camp and then we'll go from there." I didn't feel odd or anything like that going into that camp. I felt like I belonged. I just figured, "Ok, just go out and relax, you're probably not going to get more than one chance at this." The selection camp went well and once I made the team, that was a good sign of things to come for staying in there in the future. I stopped playing softball competitively in 1994 in order to be able to handle the summer training for hockey. I realized that I had to focus on hockey and only do softball for fun.</i>
R1	<i>You have to take risks in life and the biggest risk I took was going out to Calgary when I was 17. I felt that I really needed a change and that was the best risk I took!</i>
R2	<i>They came up to me afterwards and said, "You should drive in our club because we have never seen someone drive like this after one week." I said, "You're kidding." I knew what this sport was about. You need one hundred thousand Swiss francs to be involved for the season. I had no money. I had just finished my studies and I was teaching but I couldn't afford to bobsled. They came back two months later and said, "The money is there. We will buy a sled for you. We will help you arrange everything and if you want to do it, we will support you for the next two years."</i>

Table 7 (continued)

Athlete	Citation
R3	<i>Up until I was 15, I hadn't totally committed myself to swimming. I remember when I did it, I did it seriously. It wasn't until I turned 15 that I made the conscious decision to concentrate on swimming, get a college scholarship, and possibly make the Olympic team, and basically not do anything else. But before that, I was really interested in trying a bunch of other stuff. I made that decision because I knew that if I had gone into high school and hadn't committed to swimming, I would have had to commit to other high school sports which take up even more time. It was probably about that age that I fully realized my potential in swimming. It was right about then that I started having an understanding of the Olympics and what they were. That would have been right after the Los Angeles Olympics in 1984. I guess more than anything, it just seemed like an appropriate age going into high school to fully commit myself to the sport. Maybe part of it was understanding that if I was going to have an academic leave, it was going to be a little more difficult, so I'd have to spend more time doing that and sort of have less time for stuff outside swimming and school.</i>
R4	<i>They had the first Team Canada tryouts and I found out a couple of months before that I was going to be invited to try out. I sort of panicked because I just played hockey. I didn't really train or anything so I started training and went to the camp. I didn't do very well, actually I got cut. I was brought in at the end and told, "Thank you very much but unfortunately you didn't make it." A couple of hours later, they said they were going to give me another chance. The second tryout never happened but they called me at school in New Brunswick where I was teaching to tell me that I made the team. From then on, I've been part of Team Canada. I guess I'm pretty fortunate that I got that second chance.</i>

1.4. Investment Years

The investment years were characterized by a period in which the athletes generally focused on one particular sport, that is, the sport in which they eventually became World and Olympic champions. At this level, they sacrificed many personal and extracurricular activities to concentrate on training and competitions. With the help of extremely knowledgeable coaches, they refined specific skills and tactics relevant to the development of their performance. Once again, the athletes' perceptions will be discussed first, followed by those of their parents and coaches.

1.4.1. Athletes

Results pertaining to the athletes' context, personal characteristics, training, and competition will be presented in this section. The analysis of the data revealed that some of the factors considered important at this stage were similar to those discussed in the previous ones. However, additional issues were raised that contributed to the development of the athletes' performance. Certain aspects of the context in which the athletes were immersed changed. The context characterizing the investment years will be addressed first.

1.4.1.1. Context

The athletes discussed factors pertaining to their family, coaches, other athletes, and support staff. Following are the athletes' perceptions regarding their family.

1.4.1.1.1. Family

At this level, family members were as important as they were in the sampling and specializing years, however, they were not as actively involved. For example, the athletes

whose fathers coached them in the sampling and specializing years were no longer playing this role in the investment years. Family members played more of a supportive and nurturing role during this period.

At that point, my family was kind of a pillar. They were something separate from swimming. They were positive in that they didn't put any pressure on me although I know they wanted me to swim and do well. I always knew in the back of my mind that they loved me for the person I was rather than the swimmer I was. That was always comforting. My family and I were always fairly close so they were just really a ground, I don't know if that's a great word, but it's what I like to use. They were an emotional ground to life outside of swimming. They were important in that respect. (R3)

My dad was playing a motivational role, encouraging me to do my best but he was not giving me any coaching advice at all. He was just supporting my career in spirit. (C3)

Two athletes revealed that while their parents were supportive, they were also worried about some of the choices they had to make.

I know when I talked to my dad about coming out to the oval, at first I think he was a little leery of it because there were no guarantees, especially after not going to Pacific Rim in '96. I think we all believed I could get back on the National Team but we never knew for sure and I had just finished school. I think he thought I could make it and he wanted me

to, but of course there was that fear too, "What if you go try and you don't make it." So at first when I got home from school, every time I brought up Calgary, he was saying, "Go," but I could tell he wasn't totally comfortable with it. Then one day my aunt, dad and I had a good talk. Up until then, I think maybe he didn't realize that I needed to know that he thought, "Yes you should go." After we had that talk, I knew my dad was fully behind me. (C6)

When I moved, my parents said it was the hardest thing to say goodbye to me because they knew I would never come back. They cried for a month when they went by my empty bedroom. But they knew it was the right thing for me and they knew it was something I wanted to do. So I learned a lot from that. As a parent, I want to make sure that I support my kids and if there's something that they really want in life, I want to help them as much as I can. (R1)

1.4.1.1.2. Coaches

The coaches at this level were perceived as knowledgeable, supportive, motivating, but also very demanding. The following citation illustrates how much one athlete appreciated his coach and teammates.

Stanford University is where I learned to be a great swimmer. I learned from my coach and from all the other swimmers around me because it was a great team out there with a lot of talent and a lot of people to learn from. (R3)

The following athlete revealed that she not only had tremendous respect for her coach, but she also feared her because she was so knowledgeable and demanding.

There was a real variety in my training in Calgary and I think that my coach was a key element. She was just such a motivator. She really knew how to motivate me. She knew exactly what to say to fix something that I was doing wrong. She believed in me. She really believed I was the best thing since sliced bread so that was great for me. She was also the type of person who demanded respect and you would not dare cheat in a workout. You would not dare be five minutes late for practice. I was almost a little afraid of her. I had that little bit of fear element because she just demanded that kind of respect from you. Anything she would say was golden because she was just so knowledgeable about everything. (R1)

Another athlete appreciated his coach because he recognized the importance of maintaining a sense of balance between training and recovery, and he was also understanding of poor performances.

I had two coaches in college and my coach that I still have today is very supportive and very important to my success. He has knowledge in so many different areas and he can support me both on and off the track. He really emphasizes balance, like he doesn't train me too hard and he's not too easy on me. Some coaches train their athletes too hard and they get burned out. But he knows the right amount of intensity to apply to my workouts and he is somewhat understanding of poor performances. A lot of times when an athlete has a poor performance, the coach will

reprimand him and I don't think that that is good at all. It is important to talk to the athlete and understand and get to the root of the problem and I think that that is one of the main reasons why he helped me a lot. (C3)

1.4.1.1.3. Support staff

Three athletes mentioned that aside from their head coaches, they worked with other valuable people such as weight trainers, nutritionists, and technical coaches.

In college, my coach had a ton of people come in as resources for us all the time. He's coached a lot of Olympians so he has a lot of knowledge to give out but in areas he wasn't so sure about, he brought in resources like a nutritionist, people who helped us with stretching and with weight workouts, and people who helped us with more advanced stroke techniques. (R3)

We have a strength training coach so there is someone who gives me a specific program and works out with me and gets me on the right track. (C2)

Since October of 1995, we have had a permanent exercise physiologist working with the team. So we've been into the off-ice stuff year round pretty much. (C6)

1.4.1.1.4. Other athletes

Other athletes influenced the participants at this level as well, both in positive and negative ways. The following citations indicate how other athletes were role models from which the participants could learn.

I had so many positive role models. I just had a tremendous environment to learn from. I was not only learning from Swiss guys, I copied the coach of the Canadians. He was very competitive and he never talked to us but I was a very good observer. I copied his skills in driving and in building sleds. (R2)

I learned a lot from other swimmers in the practices. We did a really good job of communicating with one another and really helping each other out, as most college teams do. So my biggest resource in college was just college itself and just having a "smorgasbord" of information to take from. (R3)

The next citations illustrate how athletes learned "what not to do" by observing other athletes and how the latter could be a source of stress.

The pilot that I was driving with when I was a brakeman was just a perfectionist. All the little things he did were just perfect but he was just a slave driver and handled people like material. I didn't want to be like that so I tried to combine the positive things from different people who influenced me. I think that brought me to a good level. (R2)

At the beginning of my career, I had a lot of trouble with a French skier. He was really independent and arrogant and he bugged me. At one point, I told myself, "He can do his thing and I can do mine." The minute I started ignoring him and concentrating only on my things, his arrogance turned against him because he couldn't affect me anymore. I was in my

little bubble and he saw that he couldn't get to me anymore. I felt good and comfortable and I continued to perform well. (C5)

1.4.1.1.5. Equipment

Two athletes mentioned that having access to adequate physical resources such as facilities and equipment was particularly important at this level.

The atmosphere and training facilities were great in Calgary because training facilities are really important too. If you don't have a good facility to train in then it's hard to get proper training. (R1)

Training was more quality at this level because we were inside an indoor facility. I didn't have to worry about the cold and the wind. (C1)

1.4.1.1.6. Sport Federation

Another topic that arose in two of the interviews that could be classified in the investment years pertained to the athletes' sport federation. One athlete discussed how he did not have any structure and financial support from his federation whereas another said he received assistance from his federation throughout his career at a high level.

Our team has always been pretty haywire and it would be easy to say, "If we would have been structured, maybe I would have had excellent results at the Albertville Games." But I don't regret that we were not structured because we learned to manage on our own and to live with nothing. Let's say that the freestyle ski team compared to the alpine ski team is like comparing Ethiopia and the United States. We are nobody in life compared to them. We have nothing, nothing, nothing. We succeed because we do it with heart and we manage to get by with nothing. Often,

we would sleep in airports or in train stations or we would pile up in one room just because it cost less money. But the thing that would drive us was the fun and our desire to compete. Skiing was a huge passion. I finished 7th overall at the end of one season and fortunately, all my expenses were paid after this. Obviously I had to pay for food but at least it cost less and I could travel. (C5)

After two years they said, "You're a young guy so we'll support you for another year or two and just try to bring you to the national team at a higher level." It wasn't me though. I didn't even like the competitive world and I didn't have too many friends in the political system. They just wanted to have another hero to fulfill their own needs so they really flattened the field for me and rolled the red carpet because all the experts were saying, "He's a new guy with talent, look at what he's doing, He's advanced and has great potential. Just make things easier for him so that he doesn't lose his energy and waste years doing stupid things. Just invest in him, he's the only one coming up in the next years." Then it was easy for me because the environment was set. (R2)

1.4.1.1.7. Education

All of the athletes except C5 were either in high school or university at this stage, although most of them were in university. Between training, competitions, and going to school, they managed a tight schedule. Nevertheless, school was important and enjoyable to them.

I sort of stretched the last year of grad school because I enjoyed playing with the university team so much. I had to be a full-time student again for a third year and I actually finished my thesis during the summer. But even if I had it on a shelf, I was still considered full-time until I handed it in. So, I did an internship with the Fredericton Canadians in marketing and group sales because I knew that working with a team or league office was what I eventually wanted to get into. I thought that if I could get some work experience and take an extra course each term, then I could play another season with the men's team plus still play for the provincial team and go to Nationals. It was important for me to be able to do something extra. I was still in the female hockey system, which was important to me too. (C6)

I attended university between 1988-1993. I think that academics and athletics complement each other because if you are just working your body, you are a bit off balance and the same goes for your mind. I think you need to work both in a cyclical fashion. A lot of people say that it is hard to do well in both but I think that once you get into an efficient pattern of putting a certain amount of hours a day into training and academics, you can do both well. (C3)

The training was pretty intense and I pretty much went to school, then to the oval or rink to train during the day. I went home to eat and sometimes I had a game at night, then did my homework and went to bed. But I really enjoyed it because it was what I always wanted to do. (C4)

Even if I would have made the national team the year before, I wouldn't have come here because I enjoyed high school. I loved it. For me, it was really important. I think sometimes it's pretty tough when kids move when they are still in high school. I've seen it go both ways. I've seen it work well and they are successful, and not necessarily just in sport. But I've also seen it where they get too involved and sort of lose their studies and lose focus. I would have never made the move even if people would have encouraged me to do it. (C1)

According to the previous athlete, university was also important and enjoyable but it interfered with her skating when she got too involved in residence life.

The first two years of university, I lived in residence. My mum really pushed me to do this because she wanted me meet a lot of people outside of skating. I think it was good but it wasn't that good for my skating because I got into the residence life. Skating and school suffered a bit but I learned a lot and moved on. (C1)

In addition to getting an education at school, some athletes coached and took courses to get certified. According to one particular athlete, this also contributed to the development of her performance.

I was the assistant coach for the New Brunswick Canada Games team in '95. When I went through the coaching program and clinics, I picked up some things there as well. I tried to evaluate my players and my performance as a player too and I just looked at things that I really needed to improve. (R4)

1.4.1.1.8. Employment

Some athletes were immersed in a context in which they either chose to work to maintain balance in their lives or they had to work to earn a living. The following citations indicate that the athletes were extremely busy working, training, and competing all at the same time.

When I finished going to school, I was holding down two part-time jobs and training full-time. And that was basically my schedule until the 1988 Olympics. (R1)

I started teaching in New Brunswick and started playing with the Moncton team. We practiced probably two or three times a week for an hour. When I found out that I had a second chance to try out for Team Canada, I started going to a rink 15 minutes away on my lunch hour. My lunch hour was a little bit longer so I would go up there and I would skate for 20 to 30 minutes and then drive back to teach in the afternoon. (R4)

In sum, the context in which the athletes were immersed during the investment years generally influenced them in positive ways. Several resources including family members, coaches, support staff, and other athletes were supportive and important to the athletes. Furthermore, education at the high school and university level was enjoyable and was an integral part of their lives. It is noteworthy that having access to adequate equipment, facilities, and funds was significant at this level. Employment was also an important issue for a few athletes.

1.4.1.2. Personal Characteristics

Personal characteristics exhibited by the athletes at this stage of their career pertained to self-confidence, motivation, and competitiveness. These attributes will be discussed next.

1.4.1.2.1. Self-confidence

All of the athletes revealed that they were confident about their abilities to perform and succeed at this level. The following citations demonstrate their belief that they could become World champions.

When I found out I was going to the Olympic Games in '84, I knew I was going to win a medal because back then, Canada was always a world leader. Canada and the US were always in a dog fight to get first and second and it had been like that for decades. So when I found out I was going, I knew I was probably going to win a silver medal. The American I was competing against was the defending World champion. No Canadian had ever beaten her before and she was really good so I thought, "There's no friggin way" and plus it was in the US so I figured the judges would favor her. So I knew that I wouldn't really have a hope in hell to win the gold medal but I was surprised that I did quite so close to her. (R1)

I didn't know what to expect going to one of the camps for the World Championships but I knew that I would be going against all the top players in Canada. When I made the team when I was 15, I knew that I was one of the best female athletes in Canada. I also realized that I was

probably a little bit special because I was so young at that point. That's when I knew that I had a future with the national team. (C4)

I was about 15 years old when I started thinking about the Olympics and setting those types of goals of wanting to qualify for Olympic trials. The closer we got to Olympic trials in 1988, the more I realized that I had an opportunity to make the Olympic team. (R3)

I talked to the UNB men's University coaches and they didn't have a problem with me trying out for the team again so that was another confidence booster. I would say that those two tournaments in '95 were definitely when I started believing that I could do it. I was really confident and positive in those two tournaments and I have carried that feeling with me since then. (C6)

1.4.1.2.2. Competitiveness

Competitiveness was another attribute that was discussed by a few athletes. In the first citation, one athlete suggested that he was not really competitive although he did everything he could to perform well. In the second citation, another athlete revealed that she had experience that allowed her to be competitive at a high level.

I didn't even like competition too much but some guys were so aggressive. They always came to me and said, "Are you ready today?" I would tell them, "I'm always ready. I'm here to enjoy the sport." I was addicted to the sport and for me it was important to drive the curves, and to have a good sled, a good brakeman, and a mechanic. (R2)

When I joined the national team in '95, I made a big jump from playing minor hockey to playing at a national level with athletes 20 years older than myself. But I think I had the experience of playing with the boys and pushing myself to continue being on the team and being competitive. (C4)

1.4.1.2.3. Motivation

The athletes were highly independent and motivated to train at this level, which was mainly due to the fact that their sport was extremely enjoyable and rewarding.

I never really had a problem with mental motivation or anything like that because track is something that I enjoy doing. A lot of people have problems with mentally getting into it. For example, I have three training partners now who used to run for Georgia Tech and we are all still competing now as open athletes. When the coach doesn't show up, they don't want to do the workout because they know if they don't do the workout, they won't get in trouble for anything. So I think that they need more mental motivation because of that. I was never the type of person who needed motivation. It has always been something that was natural for me. Whether or not the coach shows up, I just like to get out there and do the workout. (C3)

I trained in an environment geared towards high performance so every day it was easy to motivate myself. The best athletes in the world were right in front of me so it was really hard not to be motivated in that environment and being on the ice every day. (C4)

The following athlete mentioned that he had more motivation and will to train prior to making the national team. According to him, his decrease in motivation was caused by a lack of structure and support from his coaches and sport federation.

I have always been independent and I would organize myself to do my own training. I would even honestly say that I regressed when I got on the national team, as far as physical training is concerned. We weren't structured enough. I had more will when I wasn't on the team. (C5)

During the investment years, the athletes were, for the most part, confident about their abilities to succeed in their sport and motivated to train to achieve their ultimate goals. The following section will provide more details on the training they did at this level.

1.4.1.3. Training

The athletes' training activities during the investment years included physical, mental, technical, and tactical training. Compared to the previous stages, practice sessions were much more intense and regimented. Although the amount of training they did was important, the quality was as important if not more. Physical training, which significantly increased during this period, will be discussed next.

1.4.1.3.1. Physical training

Most of the athletes revealed that they did more physical training at this level such as weights, push-ups, sit-ups, stretching, massage, and other dry-land activities relevant to their performance. In most cases, they followed specific programs that were designed and monitored by strength training coaches.

The period between '93 and '95 was my biggest breakthrough in track and basically the only difference was that I got a lot wiser about my weight-training. I trained every muscle in my body with a great deal of intensity for four hours. I started training more efficiently with the weights and stressed the muscles that were most important to my running motion. I took the emphasis off the other muscles because I needed my body to be as light as possible and I couldn't let it get too bulky. I stopped most of the upper body weights except for the abs. I found that I was deficient in my hamstring strength so I focused more on training my hamstrings and put less emphasis on my squats. It is a good exercise but it can take four weeks to recover from a good squat workout. So I de-emphasized that and just redesigned my weight program, which I think led to my success after I left Georgia Tech. (C3)

There was some dryland. We did weights three times a week and it was probably for about one hour in the weight room. (R1)

By the time I got to college, the difference in time commitment was that we started lifting more weights. I started doing a lot more out of the pool like stretching, sit-ups and push-ups and those sort of things. (R3)

1.4.1.3.2. Technical training

In addition to physical training, the athletes invested a considerable amount of time refining the technical aspects of their sport. The following citations demonstrate the importance of technical work at this level.

The most important thing for me was technical work. I was never a technical skater so to really learn the technical part and adapt that to training is one stage and taking that from training to racing is a completely different stage. I see athletes who train and they're perfect but they go to race and they can't. Again, that's just experience and it's part of the training, whether it's doing psychological work, practical work on racing or learning how to adapt races from training to competition. (C1)

That's really where I did a lot of technique and really fine tuned all the things that I had learned up until that point. It was a time when I was given an enormous amount of information to kind of sip through to decide what was important to me, and what I could use and couldn't use. (R3)

Once they announced that I would be on the team, they sent out some information on some of the technical stuff so I was going over that. I kept training with my club team and going up at noon hours to train on the ice just by myself. I would work on my shooting, puck handling, and skating and I just did some of the actual training on the ice. (R4)

1.4.1.3.3. Mental training

Mental training was taken quite seriously at this level. Whether the athletes were conscious of it or not, they engaged in elaborate cognitive processes that enabled them to visualize, focus, and develop an acute sense of awareness of their environment. As previously mentioned, mental training often occurred in conjunction with other training activities. The following citation provides an excellent example of the mental work one athlete did as she engaged in technical training. It highlights the importance of learning

how to get mentally prepared early on in order to be able to perform well during competition.

Everything changed the last couple of years. I had different programs and different coaches who said things in different ways. It clicked with some people while it didn't with others. I think I was just ready to work on technique. My coach had me work on it and explained it in different ways and it clicked with me. Most of the time, it takes mental work to just think about it. When I train, I think of certain things. Most of the time, it happens racing day, but still not all the time. (C1)

The following athlete discussed how her coach helped her to develop self-talk strategies that significantly contributed to her wins during competitions. Through extensive preparation, she was able to overcome her fears and acquire the necessary confidence to beat her most challenging competitors.

My coach has put a lot of effort into the psychological part of it and there was a complete turnaround in my wrestling when I had a talk with him before Nationals in '93. I never really knew anything about sport psychology. I would just go out there and wrestle. But then he talked about positive self-talk and introduced me to that so he gave me some strategies and I tried them. At the second National Championships, I had a talk with him before my final match and I remember that it was going to be a pretty tough match for me. It was against a girl who was a judo champion so I was a little bit nervous just because she had a lot of combative experience. He got me into a state where I had just an awesome match against her. I

just demolished her with no fear and it was just wrestle, wrestle, wrestle. I felt really good in the match and I was so focused! It was something I had never experienced before because a lot of times I would think more about other things. So it was him who helped me out a lot. (C2)

In the following citation, one athlete discussed how much of a challenge it was for him to remain in control of the mental and emotional side of his performance. He was eventually able to do this with the help of a sport psychologist.

The physical part of training was never a problem for me. I really really liked that aspect. I realize now that for me it was always trying to balance the physical side of my training with the mental and emotional side. The problem was I never realized that until the latter part of my career. Most of the time in training or meets, that stuff happened by accident. I just happened to get the mental and emotional side of it right. But I worked with a sport psychologist who helped me make things happen on purpose. (R3)

Imagery is another valuable skill that was discussed by some of the participants. It is interesting that both individual and team sport athletes reported using it to prepare for training and competitions. Two of the athletes who engaged in more life-threatening sports like bobsledding and freestyle skiing put a great deal of emphasis on this skill. They engaged in mental imagery on a regular basis to complement their physical and technical training, and also to prepare for adverse conditions in competitions.

I don't know how long I did this when I was preparing for the Lillehammer Olympics but I had imagined a scenario where I was the last

one to come down at the Olympic Games. I had created an atmosphere with all the stress I could encounter. I often created the worst conditions possible to see how I would negotiate them. In my head, I would see myself at the starting line doing a false start. I just imagined all the worst things that could happen and I found myself in one of those situations. I was the last one to start at the Olympic Games. I closed the event and took care of everything for everyone! (C5)

I visualized a lot more skills and team play. When I watched hockey games, I started to pick out things instead of just watching them. (R4)

In bobsledding, you can only do two or three runs per day. I would have liked to be able to do 20 of them but I couldn't. The physical demands were too high. I only had the energy to do it two or three times because the pressure of 5Gs made me really suffer. I also had to carry my 200 kilogram sled and put it on the track. So I did a lot of imagery instead and it was a real learning process. I would see the experts sitting in the locker room and always doing it half an hour before they trained. They also did it for half an hour when they started training. They walked the track and always turned around to see themselves doing it. I had to learn and perfect that. We called it our inner videotape. I had to have a perfect inner videotape of what I wanted to do. I could do it in my VCR in my head. I just pushed the button and did it. Then I had to adjust to the speed and changes on the track and that was a learning experience. Each track filled up a videotape in my head. (R2)

The aforementioned athlete reported that he developed an acute sense of awareness at this level. He acquired an ability to perceive details and this was crucial for him to be able to adapt to his changing environment. In the next citation, he discussed how he had to use kinesthetic feeling and perception to evaluate the tracks on which he risked his life almost every day.

Every day, the track was in a different condition. I had to go there, walk the track and feel what had changed. I then had a good perception of what I had to change in my inner videotape so that when I went down, it was appropriate. Sometimes I had to trust what I saw. I watched videos and observed my competitors and I then tried to combine this information with my feelings and what I perceived. I worked like that and it went very well.

(R2)

1.4.1.3.4. Tactical training

Tactical training appeared to be extremely important at this level. This type of training entailed developing strategies to not only outwit opponents but also to become more efficient and independent during training and competitions. One athlete commented on how she was not familiar with tactics when she joined the National team and as a result, she had to concentrate and think a lot during training. In fact, she revealed that learning the tactics of the game was what required the most concentration during her training at this level.

When we had our Pre-World Championship camp, we were together for a week before it actually started. In practice, I had to concentrate a lot because everything was new. Just following things up on the board about

team plays, break-outs, fore checking and all that required a lot of concentration because I hadn't seen or heard of it before. (R4)

The following section includes more excerpts from the interviews that illustrate how developing strategies and tactics to maximize performance was significant at this level.

1.4.1.3.5. Orientation

The training activities in which the athletes engaged during the investment years were aimed at improving performance. The athletes were asked to discuss some of the activities that were most important to perfect their skills. Most of them revealed that they related to either technical or tactical training, or both. They also mentioned that to improve at this level, they had to work on many details over and over again. Sometimes the repetition became a source of boredom.

I think what you have to do is work on techniques. Scrimmaging is always the most fun to do because I actually get to try what I'm practicing but what's more important is fine-tuning my techniques and setting-up tactics and strategies for the scrimmages. I find that sometimes it gets monotonous because I'm drilling the same things over and over and over again all the time. (C2)

The most important thing was being on the ice working on individual skills and just refining everything because I think at that age, I knew everything there was to know about how to take a slapshot. It was a matter of practicing that and just doing those things over and over again. It was also playing games and learning things from game situations like how to

move on the ice and finding open ice. So there was always a constant learning curve but I pushed myself to be better at the little things I was doing and that was a big factor. (C4)

I'd say it was probably shooting and handling the puck. It still is. It's just one of those things I can't do very well. I think I missed something when I was growing up and it isn't developing. I got better with practice but I will never have that natural sort of performance. (R4)

One athlete enjoyed the repetition and routine because he knew what to expect.

I think that our workout plans are very repetitious. I have run the same workouts for ten years now and the rhythm and routine that we do is what keeps me going and keeps my training continuous. I know what to expect and it is a cycle that we go through. (C3)

The aforementioned athlete reported that physical training was most important to improve his performance. He emphasized the fact that weight training programs should be individualized and designed to meet personal needs.

The weights were the most important and I still think they are but they have to be done wisely. You must cater to your deficiencies and also to your event. Sometimes physiology experts say that you are supposed to put emphasis on your quads and not your hamstrings and vice versa but everybody develops differently so people who are deficient in their hams have to put more energy into that. So there is not one prescribed formula that you can just give to everybody. (C3)

When asked if weight training was enjoyable and required physical and mental effort, this athlete replied:

It can definitely be a very grueling process. I think it's fun but I see a lot of track and field athletes spend all their time at the bench press because that is fun for them and that is why they are doing it. But I don't think it is helping them that much because they don't run any faster. So it is how you look at it. What is enjoyable is to see the progress when you feel your body getting stronger and your performances are improving. You see a direct correlation between how hard you work and your progress and that is a good feeling. (C3)

The following three athletes provided similar responses when asked if effortful activities such as physical training were enjoyable.

Of course there are some days in the weight room when it doesn't feel good but we can all appreciate that it's helping in the long run. So it's not really anything to complain about or turn you off the sport. You can look at it as a challenge. You are pushing yourself to do the best you can at whatever exercise it may be. At the same time, it's causing you pain but then you know that you're doing the best you can at that exercise. My motto is: "Whatever you're doing, do it to the best of your ability." If it's off-ice training you know that it's going to help you do something better on the ice. If it's working hard at practice on the ice, then you know that you're working on things that will help you be better at the game. So I think that even though it's work, you know that it's going to help improve

your performance which will give you satisfaction in the end. It may not feel great but at the same time, it's still enjoyable because you know that it's helping you become better. (C6)

Going out on the ice by myself was always so much fun. The weights and the bike were fun sometimes. Other times they weren't but I knew I had to do it if I wanted to do well. Sometimes I got in there and totally didn't want to do it but then once I started, I felt better. So it just depended on the day. Some days it was great and other days it was the last thing on earth I wanted to do. (R4)

Certainly, there are ups and downs. There are days when I have to run a dozen intense 400 meters and let me tell you that when I get to that 12th one, the track isn't the best thing on my mind. There are aspects that are not as fun but crossing the arrival line with an excellent run gives you about one minute of euphoria and this minute justifies the weeks and weeks of training that you have to do. (C3)

I don't know if physical training was fun but I will put it this way; I never really looked forward to practice except for a few times when I knew we were doing something cool. But once I got to practice, from the time practice actually started until it ended, I usually was challenged enough that I walked away from the workout with positive memories of it. So in that respect, I always enjoyed that. I had some bad workouts and some bad memories of workouts but overall workouts were an enjoyable experience for me, especially in hindsight. Sometimes it sucked to be at a

workout but it is fun to look back and think about how hard it was and how much work I was getting done. (R3)

The aforementioned athletes did not always enjoy physical training and the process of performing cardiovascular activities and lifting weights. They did however enjoy the outcome of this process, that is, improved strength and performance. Overall, they seemed to enjoy practice activities that involved refining technique and tactics more than dry-land activities.

One element that stood out in the athletes' discussion of their practice activities at this level was the quality with which they aimed to perform them. It was apparent that they focused not only on quantity but also quality, even in the most adverse training conditions. According to the following athlete, everything was important at this stage, especially recovery periods. Even when he was tired or not having a good workout, he made a point of working on a specific skill with the utmost quality.

I don't think there is a single aspect that was most important in my training. I think I always did a really good job of physically balancing my training so that when I knew I was tired, I rested. On the other side of the physical, I knew that if I wasn't having a good workout and if I wasn't swimming fast, there were a lot of other things I could work on to get better. I could just work on my flip turns for example. Even though I was tired and wasn't swimming fast, I could try to make sure every flip turn was just right. So I did a good job of always physically trying to get better in some way, no matter what. (R3)

The following athlete revealed that she was able to increase the quality of her workouts when she joined the national team because training constraints such as the cold weather and wind were removed.

Training was more quality I think because we were inside an indoor facility. I didn't have to worry about the cold and the wind. Quality was also more important because I was on the national team and there was one fixed coach. (C1)

One athlete admitted that because training at this level was often repetitious and monotonous, she sometimes failed to perform the skills and activities with high quality. She was conscious of this and set a goal to try to improve her performance every time she trained.

I was doing the same thing, for instance, a double leg take down. I have drilled it over and over again for the last seven years but still I try to improve it or get in deeper on the penetration step. There is a variety of finishes that I can do but sometimes I get bored with it. Sometimes I just do it and I don't really think about it and I find that that is something I have to work on. I have to make each move meaningful and try to improve it each time. (C2)

In addition to being geared towards high quality performance, training during the investment years was challenging, intense, and regimented. The next two athletes were very appreciative of the opportunity they had to train with others who were highly skilled because this increased their intensity and their level of performance as well.

I found that when I moved to Calgary, the guys I had to wrestle were a lot tougher than the ones in Edmonton. There was a better team here in Calgary so they had a lot more guys who wrestled at a higher level. So I think my wrestling picked up just because I was in a room with guys who were trying to make the Olympic team. I got to train with them so naturally my level and intensity went up. (C2)

The difference in high school was the intensity of the workouts. At that point, I was committed to swimming and learning as much as possible. It was at that time that I also started swimming against a lot of older people. I was 15 swimming with 18 year olds. That's a big age difference so that intensity level made it more difficult. (R3)

The fact that training was more difficult and challenging and led to improved performance was also discussed by the next athlete.

I attended Georgia Tech in '93 and that is when my training really started to get difficult. I progressed just about every single year and I ran a little faster. Some years I progressed more than other years. (C3)

Another athlete admitted having difficulty to commit herself to training. She only started to be more disciplined and intense in her workouts at this stage, which led her to train all year round rather than just in the fall and winter. Prior to the investment years, she was not ready to engage in continuous rigorous training.

During the last four years, I have focused to really do the summer training from May until September. Those are the key months to make it through the season. It took me a long time to develop the desire to train and just to

put that time and effort into it. I can't explain it. I think everyone develops at their own pace and in their own time. Some skaters start rigorous training when they're 15, others start when they're 25. It just depends on each individual. (C1)

It is interesting that two of the athletes mentioned experiencing pain during their workouts, which illustrates the intensity with which they trained.

I really started to push myself in training and started to work a lot harder and started to feel pain in my workouts and it has been like that ever since. (C3)

Since 1994, we've definitely become a lot more regimented in terms of conditioning. But we've realized that the stronger we get through that kind of training, the more it's going to help our on-ice performance. Some days I am sore after a weight workout but I realize that it's all part of the plan. (C6)

1.4.1.3.6. Schedule

The athletes' training schedule for the investment years is presented in Table 11 in Appendix L. As can be seen, they practiced between 15 and 40 hours per week. In addition to this, they spent approximately one to seven hours lifting weights or doing other dry-land activities. Consequently, they trained significantly more hours during this period than during the sampling and specializing years. In fact, training basically became a full-time job at this level, although some athletes still went to school or worked part-time.

1.4.1.3.7. Recovery

Due to the fact that the athletes invested a considerable amount of time and effort into training, recovery was extremely important. The athletes revealed that they had one to two days off per week to rest.

We work hard for five days and take two days off and do the same thing the next week and it is just continuous and repetitious and it is a very gradual and smooth way to get in shape. (C3)

The number of hours the athletes slept also appeared to be of great importance. One athlete reported that to feel 100% during training and competition, he needed to take an afternoon nap and get a good night sleep.

It's fantastic to drive but you have to be aware of what's going on. You always have to keep learning. So I started to sleep after lunch and I slept at least eight hours at night to feel good. (R2)

As can be seen in the following citation, one athlete's way of recovering was by focusing on things outside of his sport when he was done training. He always tried to maintain some balance between training and his personal life.

I tried to mentally balance swimming with everything else that was going on in my life. When I left the pool, I tried to basically put swimming behind me and go study, hang out with my friends or whatever. On the other hand, when I walked onto the pool, I tried to put the rest of my life behind me and not think about the test I had coming up or the fight I had with my girlfriend. I think I realized that every day. I had two hours at the pool and took advantage of those two hours. So for me, one of the most

important things was balancing training with the rest of my life. I always felt like I did a pretty good job of it. I never got burned out for example so I must have done a fairly good job. (R3)

1.4.1.3.8. Extras

An interesting theme that emerged from the athletes' discussions pertained to extra training activities. These for example included appropriate warm-ups, warm-downs, and massages. Furthermore, two of the hockey players mentioned that they were always looking for extra ice time to perfect their skills. All of these additional training activities were perceived to have contributed to the meticulous refinement of their performance.

It wasn't just the training, it was the proper warm-ups and warm-downs, massages, hot-cold treatments, especially in the last two years. That's the sort of stuff that brings the athlete to perfection but it consumes your day. That's why it ends up being an eight hour day because the actual training might take three or four hours. It's the extras that take time. I've usually been pretty good at that but I find it hard to motivate myself to do proper warm-downs, especially after a hard training. The hot-cold treatments are really good for helping my legs recover. It takes time so I often get lazy. But I think when you want to perform at your best, you realize that you have to do those little things. I also have massages. Everyone says, "Oh, how nice!" but they are painful. I have to do them because they help me recover. (C1)

Although we weren't really swimming any more hours, I was probably spending six to seven hours a week extra just on other stuff. So it probably

would have added up to anywhere between 25 to 30 hours of training.

(R3)

I had to keep training off ice and try to get on the ice more during the winter. I got involved with a men's old-timers team so I could go play with them just to get extra ice time. A friend of mine was a rink attendant so I would get on anytime I could. Sometimes it was at six in the morning. Sometimes it was at four in the afternoon right after work so if I could get in on time, I would get a half hour of ice. I did things like that to get as much extra ice time as I could. (R4)

As previously mentioned, one athlete even enrolled in an extra year of grad school in order to continue playing with the university hockey team. It was important for her to get that extra training time and experience with the men's team, in addition to being part of the women's provincial team.

In sum, training during the investment years was significantly more demanding and structured, and involved considerably more hours than in the previous stages. The athletes engaged in not only their regular physical, technical, mental, and tactical training activities but also in extra activities deemed important to refine specific aspects of their performance. It is noteworthy that training was done with a higher level of awareness and quality.

1.4.1.4. Competition

Competition during the investment years was extremely important and meaningful because it gave the athletes the opportunity to apply the skills and competencies they developed in training, and to evaluate their progress and success. The

athletes discussed at length how they prepared for high profile events, coped with pressure and expectations, and evaluated and recovered from their performances. The first section will focus on their pre-event preparation.

1.4.1.4.1. Pre-event preparation

The athletes invested a considerable amount of time preparing for competitions at this level. Of interest is that three athletes reported having a particular mindset upon entering momentous events like the Olympics and the World Championships. This enabled them to stay calm and focused and to cope with various expectations, pressure, and unforeseen circumstances. As can be seen in the following citations, they remained confident and at peace with themselves by engaging in personal self-talk and by putting competition into perspective.

I basically didn't treat the World Championships or the Olympic Games as such. I treated them just like a provincial championship or just like a practice competition. I couldn't take that mindset, "Oh my gosh, this is the Olympic Games. There are millions of people watching me live on TV right now." If you think like that, you are going to screw up. Your mind is just going to completely go bonkers. So I really had to minimize everything and I always would think positive heading into a competition. Instead, I thought, "What am I going to eat after this? I'm going to have some ice cream." I was thinking about food and stuff like that. I would also put it into perspective, "This is only a friggin sport. This is such a minuscule part of my life. There are people who are dying out there and I'm sweating about swimming in a swimming pool." So I put it into

perspective, even though I'd been training my entire life for this moment. But really in the big picture, it was a very minor detail in my life, I mean deep down when you really think about it. (R1)

You always hear a lot of statements by other people but what I learned is that if you are in a competition, you are the only who can decide what is good and what is bad. You have to work on your own inner framework. That took another four years for me to be able to do this. In '89, one year after the Olympics in '88, I won the World Championship title in four men and was second in two men and I won a lot of World Cups because of that learning process. I just adapted and said to myself, "It's just a competition. It's like training. It doesn't matter to me if it's the Olympics or it's a little competition, it's the same." So if you're doing it in front of one thousand or a million spectators or you do it just for fun somewhere else, it doesn't matter, it's the same work. (R2)

In '92 for example, I'd asked myself, "What happens if I lose the race? Well this is going to happen, this isn't going to happen and this isn't going to happen." I never did that in '96. It just wasn't important. I understood in my mind that win or lose, I wasn't going to be a different person after the race. So I didn't define myself by the result of the race. I was totally at peace with myself and that may be the simplest way to put it. I was just relaxed, not even relaxed, just at peace is probably the best way to say it. Everything that was going on inside of me and everything that was going

on outside of me was just right on. I was resonating. I was really comfortable. (R3)

Two athletes mentioned that they followed a certain routine prior to competitions that allowed them to be somewhat consistent in the way they prepared from one event to another.

We would generally always have a practice that morning. Our competition times would be different every competition so we would never know what time we were competing at, but we'd always have a practice. After that we would prepare for the competition, like we would have to put our hair up and all those kinds of things. (R1)

I have a routine the day before and the day of the competition and I think it's good. Competitions are always at different times so the routine changes a little bit. It depends on what country I'm in. I don't really do anything special. No matter what time the competition is at, I'm usually at the oval two hours before. We go on the ice for a little warm-up, then we sharpen our own skates, do some jumps, and then get ready for the race. So whether we race at 4:00 p.m. or 10:00 a.m., it's the same routine and the hours in between, we just sort of hang out. (C1)

The following athlete said that he did not follow a specific routine before an event, although he ensured that he always rested for two days preceding the event.

I don't really have a routine. The only thing that I make sure of is that I take two days off before the first race. As long as I do that, I will be ok. My coach gradually increases the intensity of the workouts until about one

week before the competition where I am running the most intense workout of the year. Then he will taper the intensity and come down a little bit. Two days before the competition, I completely rest and I do a lot of visualization. (C3)

At this level, the athletes prepared themselves not only physically but mentally as well. Imagery, relaxation, and self-talk were all strategies they used to obtain an appropriate frame of mind for their event. The following citations illustrate their use of self-talk to remain calm, confident, and focused.

I would usually become very introverted because I'm a very hyper and extraverted person. I would kind of retreat. I tried to just be by myself a little bit, even if it was just going into a bathroom stall and sitting on the can to get away from people and to try to psych myself up. I would think, "God I feel great. I just want to go out there and kick butt." So I would try to be a cheerleader inside. Even if I was feeling like shit, I would try to convince myself that I wasn't. (R1)

I prepared myself psychologically and had a routine that my coach helped me with. He wrote down some sentences and there were four sentences that I would say: "I am a healthy, powerful, and confident individual." And then I would say the same thing but start off with, "You," and then, "She is a healthy..." This was just in my head and 20 minutes before my match after my warm-up, I would just say these sentences over and over, going through them one after the other. So by the time I was ready to go to the mat, I had said all these key words like, "fast" and "fierce" and things

that had some meaning. He had given me some words and I changed them so that they would be more meaningful to me, like, "I have the boldness and drive to make anything happen." To me, that was really powerful and it really worked for me. It helped me to focus on that instead of worrying about losing. (C2)

Some athletes talked about staying relaxed before a competition. They did not engage in structured or systematic forms of relaxation but rather remained calm by keeping to themselves and by limiting their interactions with others in their environment. One athlete made sure to take deep breaths before his races to prevent himself from getting tense.

For me, the best thing I could do was just relax and swim my race. I wasn't a really fired up competitor or a mean one. So it was best for me to just kind of do my own thing and it was a rare occasion that I actually even knew who was swimming next to me, unless they were my friends. We are given lane assignments beforehand so we know who we're swimming next to and those sorts of things. I looked at what lane I was going to be in and that was it. I never ever looked at who else was swimming in the heat. It's just one of those things. I just wanted to swim my race and that was really all I could control so that's all I worried about. (R3)

I would try to really pull myself away and try to calm myself down cause I'm a really hyper person. I get really excited about things and that's what I have to do sometimes is just relax and just try to calm down. I didn't do any type of systematic relaxation. I just walked around, sat down, not

really made eye contact with anyone, probably looked kind of spacy, and just kind of relaxed before I would go out and swim. That would be the extent of it. (R1)

I really don't have a problem relaxing before a race. I know some athletes do and they should apply some form of relaxation technique. But I never really had a problem with that. I just remember to take very deep breaths. When you get nervous, you can hyperventilate, but I take very deep breaths and take in as much oxygen into my lungs as possible. (C3)

In addition to self-talk and relaxation, imagery was another strategy that some athletes used to prepare themselves for a competition. The following citations show the extent to which some athletes relied on it. Once again, imagery did not appear to be done in a structured manner, except for R2 who visualized more consistently immediately before and after a race.

I had perfect videotapes of each track at the end. I also have them now. I have huge picture memories and I think that's the reason why I study a lot of physiology and neurophysiology. I think there's a big link between inner imagery, memory, and other types of holistic thinking. I built up what I wanted to see in my virtual world in the locker room through imagery. I compared it with my past experiences but then I did a run. When I got to the finish line, it was very important for me to do my imagery just in the next 10-15 seconds. I sat down somewhere and thought about what I saw. This takes memory. I thought about all the little mistakes and what I really wanted to perceive. I was always searching for

what was real and I compared what I felt and saw with what I prepared in the locker room in my virtual world. The more these two worlds were the same, the less interference there was. (R2)

You do have to think about it a lot to get yourself ready to compete. You have to visualize your competition and put a lot of thought into it. I just picture myself in the blocks and I picture the gun going off. I picture myself running the race, how I would like to run the race, and it is very important that I always focus on my running. For example, when I lift my knees, I can't lift them too high or leave them too low. I have to apply the right amount of lift. So it is things like that that I want to visualize when I am preparing for a competition. There are certain points in the race where I will need to overstrike to get to the hurdle so I will visualize overstriding at that point and if I visualize it enough, I can run the race as I had hoped to run it. I typically see myself within my own body and I do feel everything. I don't really do it in a structured manner. It is constantly on my mind for two days leading up to the race. On the day of the race, it is on my mind too so I might be eating my lunch and thinking about it or doing whatever else and still be thinking about it. I also do imagery when I start to get nervous and tension starts to build up in my body leading up to a big race. (C3)

Because I had played competitive badminton at a high level, I always had things I did to prepare for that so I just applied them to hockey. When it came to team play and technical stuff that I had to concentrate on, I would

sit down at night and draw things out on the rink just to see them. For instance, "If she's going here, I'm going there, and this is happening." I would do those sorts of things just so I would feel more confident about them. Or anything that we had done in practice, like a drill, I would draw it out and think about it and I'd do some visualization at that point because that's what I had done at badminton so I sort of carried it over.

(R4)

According to the synchronized swimmer, she did not have to do a lot of imagery in the latter part of her career because she spent so much time practicing in the water. Her routines were so well ingrained in her mind that she could reproduce them in competition without having to think too much about them right before the event.

I would usually visualize my stuff the night before and that would put me to sleep within three minutes. Because we trained six to eight hours a day in the swimming pool, we were almost like robots when we got in the pool. So it was hard to make mistakes because what we had to do was so ingrained in our brain. The good part about doing those kinds of hours is that when we got in the pool at a competition, it was just second hand to go in there and do it. When I competed, we had compulsories so the night before, I would go over them in my head and remember things that I had to do. But I wouldn't really visualize. If anything, the day of the competition, I would try to completely focus on things other than the competition because it would just make me nervous. And when you're really nervous, that's when you really screw up. (R1)

Pre-event preparations varied considerably from one athlete to another but they also varied depending if the athletes were preparing individually or as a team. The synchronized swimmer revealed that it was important to know and respect how her teammates preferred to get ready.

When you're by yourself, you're the only person you have to worry about. But when you're with a duet partner or when you're with seven other girls, you have to think about them. So you have to take into consideration how they like to do things before they compete. If someone likes to be quiet or if someone likes to be loud, you have to respect that. So you have to get a feel for how the other one likes to react before competition and just go with the flow. But you can't be so laid back when you're with them because you're thinking about them as well. I would usually just joke around more. I would try to loosen everyone up because I was usually more of a team person. I would try to get everyone calm and cool and just thinking about other things than the competition. I wouldn't say, "So remember to do this, remember to do that." I would never ever say that before we would go out. The last thing I would always say before we would go out was, "Ok, let's have fun you guys, let's do it." And then we would go out and do it. (R1)

1.4.1.4.2. Excitement

The athletes obviously invested a lot of time preparing to go to important events. Once they were there, the experience was very exhilarating for them. Three athletes

shared the excitement they felt the first time they attended the Olympics or World Championships.

When I look at my first experience in '94, it was really exciting! I was the back up goalie that year so it was great. To be there was like, "Wow." It was a great experience and I thought, "I want to do this again." (C6)

I'm sure I was nervous but I don't really remember being totally uptight or anything for the attention it was getting. We did well. I think it was all so new, it was really exciting! (R4)

I never ever thought that I would go to the Olympic Games because the solo event wasn't an Olympic sport. It was only actually two months prior to the Olympic Games in Los Angeles that I was told I was going. The event was just added at the last minute. I felt like I won the lottery! When my coach phoned me up and said, "Guess what? You're going to the Olympic Games!" I was just like, "Ohhhhhhhh!" It was just another Cinderella story for me to go to the Olympic Games and to do so well. (R1)

1.4.1.4.3. Expectations / pressure

Even if the Olympics and World Championship were exciting, they came with challenges and drawbacks. For most athletes, expectations from coaches, sport federations, family, and friends were high. This undoubtedly created pressure and stress that ultimately affected their performance. In the following citations, it is apparent that some athletes were scared of failing and of letting others down. As they gained experience, however, they became more confident and developed skills to cope with the

pressure. Having an appropriate mindset appeared to be important because it allowed the athletes to treat the Olympics and World Championships like any other competition.

In 1991, I started traveling and every year from then on, I went to World Championships and raced in the World Cup circuit. In 1992 and 1994, I went to the Olympics, as well as this year. So every year, it's the same group of athletes who does the circuit. I think I was one of the athletes who definitely took a while to get used to the racing. Maybe it was just the lack of experience, the nerves, and dealing with all of that. Having experience and confidence makes a big difference. Some athletes were 21 years old and did great at World Championships. I definitely wasn't experienced enough. I was still probably all struck. Again, I didn't race well. I trained better than I raced. So I'd get to the big competitions and panic a little. I believe everything happens for a reason. It might happen to somebody for a different reason. That was just my stage of development. You sort of take it as it comes and you might be disappointed with some things and happy with others but you can't overanalyze them. (C1)

The first time in 1988 in Calgary, I knocked myself over. I thought like many others that the Olympics must be something special. They are, really! But if you think that, you change all your emotional habits. I did a good training session. I was one of the favorites there but in competition, I didn't see anything on the track because everything changed. Things didn't change from the outside, they changed inside as a result of the importance I placed and my coaches and family placed on the

competition. They said, "Oh you're there, that's great, do a good job." I thought it was important but it was really complicated. I should have thought of it as any other race. I really did not do well. (R2)

When I was 15, I put a lot of pressure on myself to perform for other people. I often wanted to swim really well for my parents or my friends rather than for myself or for any other reason. For example, going to the Olympic trials in '88, I really wanted to make the Olympic team but I wanted to make it for everyone else it seemed like. Part of it was I was just really unselfish. I think part of it too was I didn't want them to be disappointed in me and feel sorry for me. I didn't want to let them down. So that made it a little more difficult. (R3)

When I went to Worlds in 1994, I felt a lot of pressure to do well, not from myself so much but from the executives in charge of wrestling Canada. They were all excited that I had won a World Championship in wrestling for Canada but then I felt pressure to do it again and I thought I would let them down if I didn't do it. I was worried about failure I guess. So when I went there, I remember I got ten pointed in my match against the Russian who I had beaten the previous year in the final. This means I was beaten by 10 points. I got creamed basically. It was awful. I thought, "Oh my god, I screwed up." I felt really bad. (C2)

The following athlete revealed that she did not perform up to her personal expectations at an important competition after being undefeated for three years. However,

this defeat incited her to work harder and to focus on what she could control in her environment.

I was undefeated until '87. I won every single World Championship in '85, '86, and '87. The Fina Cup was in '87 in Egypt and I lost to my main rival against whom I would be competing the following year in the 1988 Olympics. This is in the solo event. That just blew me away. It just really threw me off because I was thinking, "This is not a good time to be losing, a year before at the pre-Olympic meet, right before the Olympic Games." So that was my first competition I ever lost after the '84 Olympics. But again, I just rebounded and worked harder because I could only control so much in a subjective sport. I couldn't control who the judges were going to put first. (R1)

1.4.1.4.4. Best performances

The athletes reported experiencing not only pressure and setbacks, but also peak performances. The following citations indicate that when the athletes were confident, daring, determined, and focused, they had some of their best performances.

After playing with the guys, it seemed like things were happening that much more slower when I played with girls and I would think, "I dare you try to get it by me." I just felt really confident and quick and things went really well that tournament. I just carried that confident, positive feeling over to the Pacific Rim. I was looking forward to playing against the US. When I got a chance to play in that final game, I felt the same sense of confidence. When it went into overtime, the other goalie was at the other

end and I knew she played a little bit of minor pro too, and I was almost looking forward to it going to a shoot-out because I thought, "I want to beat her too." I just had that sense of confidence and when we hit the shoot-out, I wasn't even nervous at all. I ended up being named top goaltender at that tournament too. (C6)

I just had that feeling, the feeling that it doesn't matter what somebody puts out in front of you. There was a wall, like I just totally focused on the little things that I had to do and nothing else really entered my head. Winning, losing, none of that entered. It was just, "On the face-off, I'm doing this or that." I became so focused that I looked at that other player that I had to block out and it was like there's nobody on earth. So she could do whatever she wanted but I was going to win this battle. I was going through walls. I was going over this and under that. It didn't matter. No one could stop me. And that's the feeling I get when I'm performing at my best. It doesn't matter what they do, I'm so determined that I'm not going to stop until I win the battle. It's just a hard thing to describe. I know when I have this feeling. I don't think I knew it then but I know now when I have it and when I don't. I can sort of tell the difference now. (R4)

When the aforementioned hockey player was asked if there was anything that led her to experience peak performances, she revealed that preparation was a key precursor.

I think what brings it on varies. Sometimes you can be playing a game and you don't have it and then somebody does something to you or gives a player a cheap shot and all of a sudden you have it. It's just like, "Ok,

that's it. I'm not going to put up with this anymore." We also have these little sayings, like, "Stay in the circle" to keep us focused. So we all came up with something that clicked for us and made us stay in the circle. Mine was "No one is coming" and everybody kept looking at me saying, "What the heck does that mean?" It just meant that no one else can do what I do on the ice and no one is going to do it for me so I have to do it. Sometimes things like that can make you think about it long enough and you can say, "I'll be ok." But most times it's just preparing you for the game. When I get to the rink, I get off by myself in a hallway and I start thinking about the game and jump around and things like that. I just start focusing and get more intense and that usually brings it on. But sometimes it doesn't. Sometimes it's hard to get it. I think there are other things that I do that will bring it on but I think you can do that to an extent. Sometimes you work and work at it and you just can't get it. And other times, it just appears out of nowhere. I don't have it quite figured out to exact science yet. (R4)

1.4.1.4.5. Post-competition evaluation

Another theme that emerged at this level was post-competition evaluation. The athletes spent considerable time assessing their performance after events. They subsequently used their lessons to plan for future training and competitions. Of importance is that these thorough self-examinations enabled them to come to terms with what they needed to change to continue improving. The following two athletes revealed

that they were affected by an outburst of emotions at the first Olympics they attended. After reflecting upon the event, they realized that they had to change their approach.

I came back home after the 1988 Olympics and thought for eight months, "Why did this happen? I trained hard for this competition and we were the best physically. We had the best pushing time and set a new track record and then we did lousy." When I evaluated the course and the race, then I could say, "It was not bad but that wasn't me driving there. It was just an average of what I could do." I said, "That's not enough." I thought about it and two weeks after the Olympics I knew why. It was because I had all this emotion that built up one month before over the media, the coaching, and the people who wanted me to be good. They pushed up the meaning of the competition but that also pushed up my feelings about the importance of the competition, and that changed my emotional approach to everything. Then I was there and thought, "It's important, I must be good." I forced myself to be good but I wasn't because I learned my techniques when I was adjusted. You can't reproduce if your whole emotional background has changed. I had learned things at a lower level of intensity when I was calm, my mind was opened to learn, and I was able to really perceive everything. Then my emotions went up and I didn't see anything. I couldn't perceive what I normally perceived in other situations. (R2)

I had excellent results that year and by chance found myself at the Olympic Games in Albertville. I was too young and inexperienced and

also, the Olympic Games were too big and we didn't necessarily have a lot of support at that time. But this helped me become who I am today. I drew some lessons from those Games. I finished 7th which is still good but that year, I had always finished top three or four on the international circuit. So I asked myself, "What didn't work at the Albertville Games?" Two years later in Lillehammer, I remembered what I should and should not do and to my biggest surprise, I won. (C5)

One athlete reported that she frequently analyzed her matches with her coach. The feedback she received from him was extremely valuable because it helped her to focus on positive aspects of her performance. The use of video appeared to be an important tool for observing her actions and learning from them.

We talk about matches all the time. He's really great because we live together so we get to talk about this a lot and we watch tapes together. The one year when I got ten pointed at Worlds by the Russian, I thought, "This is bad and I screwed up." I had negative thoughts and then we sat down and watched the tape and wrote down on paper everything that happened. When we looked at it on paper, he made it look like I did much better than what I thought even though I lost by 10 points. He wrote down all the good things I did in that match and then I watched it and thought, "Yeah, I did do that well and she finished it but I did 90% of the moves so that is awesome. She just did the last 10% and she got points and I got nothing." So when we analyze the matches and break them down, we look for the positives. (C2)

1.4.1.4.6. Recovery

Recovery was another significant theme at this level. The athletes discussed some of the strategies they used to allow themselves to recover mentally and physically from competitions and from the intense training they did before an event. One way to allow themselves to mentally recover was to rest and focus on things outside of their sport.

I'm one to always run around and do errands. As a sprinter, I know that performing at my best requires putting my legs up and resting when I can. So before competitions, I always try to get home, put my legs up, not answer the phone too much, and forget about the errands. The little things that really drain you are mental stress. It can knock your performance for sure so it's really about dealing with those things. I think as I've become more experienced and mature, I realized that I can't concentrate on skating all the time, it exhausts me. I have to rest by watching a movie, reading, or doing stuff like that. It's completely individual but it is key.
(C1)

I think about track when I need to. I don't think about it 24 hrs a day. I leave it alone when it starts to drain me and I start to think of other things. It's important to have other things to concentrate on instead of always thinking about your sport. (C3)

Sleeping was central to the athletes' recovery. Two athletes talked about napping during the day in order to feel refreshed for competitions. This next citation illustrates the incidents that one athlete faced when he had a lack of sleep.

During the weekend in between training runs, we partied and had some fun. But then we were a little bit tired and we crashed going down. We were tired because we didn't sleep enough. The next day we went out again and crashed once more. Then I began to think, "Why am I crashing? I'm not comfortable, I'm not feeling good, I'm not seeing much. I have to rest and sleep more." I realized that I had to be really rested to see what was going on on the track. Perception and rest were highly correlated. So I stopped going out at night because it was dangerous to go out and sit somewhere in a bar until midnight. (R2)

In sum, competition during the investment years was highly demanding and challenging but it was also very exciting. Due to the pressure associated with high profile events and to high expectations from sport associations, coaches, family, and friends, the athletes did not always experience success. However, they analyzed their performance on an ongoing basis and engaged in extensive mental and emotional preparation in order to develop appropriate coping skills and a positive mindset. This in turn enabled them to be confident and focused, which in turn led them to perform at their best.

Before presenting the results pertaining to the maintenance years, the parents' and coaches' perceptions regarding the development of the athletes during the investment years will be discussed.

1.4.2. Parents / Coaches

The parents described contextual factors that were relevant at this stage. Furthermore, both parents and coaches provided some information about the

participants' personal characteristics and issues related to their training and competitions.

The next section will focus on the context of the athletes during the investment years.

1.4.2.1. Context

The context within which the athletes developed somewhat differed at this level. The parents shared their thoughts regarding their roles, responsibilities, and the support they gave their children. They also talked about coaches and the education their children pursued. The first section deals with parental support.

1.4.2.1.1. Parental support

The parents reported that even though their children moved to another level during the investment years, they were still very supportive of them. While they continued to provide the love and encouragement their children needed, their responsibilities of driving them to practice and competitions diminished once their children got their driving license or their trips were organized by the national team program. The financial support they had provided all along also decreased when their children went to university on scholarships or when they received assistance from their sport associations.

My role changed as he got his driver's permit! Once he started driving, then it wasn't necessary to go to the meets or anything. I always went to his meets but it wasn't necessary to drive car pool or that sort of thing. Of course, we supported him financially until he got into college. That was one thing with his swimming, he was never able to work a summer job or anything like that so we just said, "You're swimming, you can't do it." So

did my role change? Not really because I was still supportive, still there for him, still his mom, still went to probably every single swim meet. (PR3)

After University, she was working so we didn't have to give her any financial support. In terms of moral support, it was easy to support her, she's a cheerful person. (PR4)

After he and his sister made the national team, we didn't have to travel up north to the ski hill like we used to do every weekend. So we sold our mobile home over there because they were always gone and didn't really have time to go anymore. We were happy for them because they were doing things that we were never able to do and also, they spent most of their winters in Europe. You can't ask for more! It was a good education for them. (PC5b)

1.4.2.1.2. Coaches

Some of the parents revealed that their children had excellent coaches at this level. One father reported that he stopped coaching his son once he entered college. However, he felt that he still contributed to his development because he would always ask him for his input. PC3 said that although he often discussed his son's training with his coaches, he never interfered with what they did.

He had a different coach in College. I didn't coach him but in a way, I did because after his races he would always ask me what I thought and I would tell him. But I would never interfere with what the coach said. That's taboo. You can't do that. I let the College coach, coach him. What I would do though is I'd speak with the coach myself and ask him what he

thought about different things. One thing about the coach at Georgia Tech was that he was very very good and very amicable. We worked together with [C3] but I wasn't his coach and I didn't interfere. (PC3)

In the next citation, one mother revealed that although her daughter did not always have access to the most qualified coaches when she first entered the investment years, she eventually did when she moved to train at the National Sport Centre.

She has actually said that in Calgary she has had good coaches. She had a good coach in Edmonton too but the thing is that at the first World competition, they just basically sent a chaperon who only had her level one in coaching. Then when she got to Calgary, they sent a good qualified coach with her. So she has had a good coach now for the last few years. (PC2)

The following mother also highlighted the fact that her daughter worked with an excellent coach at the National Sport Centre. She confirmed what her daughter said about communicating well with her coach but all the while remaining a little afraid of her.

Her coach in Calgary was fantastic and she had a very good rapport with her and still does. She was an excellent, excellent coach. Communication is a big thing and it was good between them. My daughter could relate to her. She was a good friend, although she was a little scared of her too! (PR1)

1.4.2.1.3. College

Most parents felt that education was important not only during the sampling and specializing years but also during the investment years. The next two citations from

parents confirm how their children were able to secure a post-secondary education at an institution of their choice.

When it came to a college, he had the opportunity to choose where he wanted to go and he made that choice based on his field of studies, the swimmers, and the coaches' reputation. Of course, Stanford isn't too shabby either academically! (PR3)

She is lucky. She can turn her skill into something else. She is getting a college education from the National team. Her university will be paid for by them. She could have done it through any number of colleges that were after her. To me, that was always the ultimate. If you can get an education for playing a sport, that's great. (PC4)

There was only one athlete who did not pursue post-secondary studies. His parents, both teachers, supported his decision to train and compete on a full-time basis. They discussed how it was difficult for their son to compete at a high level due to the lack of understanding of some of his teachers and high-school principal. They believed that he got a tremendous education through his sport and that he did not need an official diploma to be successful in areas outside of his sport.

He didn't go to school, he just skied. His sister did and she struggled. Schools are not made for people who perform at a high level. You have to perform within the school, otherwise they don't understand and cooperate. It was always a challenge to deal with them. It depended on the teacher and school director. It's too bad. But then again, you don't just get an education in school. In our son's case, his sport has been an education.

He learned English and he always took time to read. When he travels, he always leaves with two books. He might not have every diploma he should have but it doesn't seem to affect him because everyone is after him anyway. He exceeds a lot of people. (PC5b)

In sum, the parents gave their children moral support even though they were not as directly involved in their lives. They confirmed that their children had access to excellent coaches and funding at this level and that education was important to them, whether they learned from an institution, their sport, or both.

1.4.2.2. Personal Characteristics

The athletes possessed several characteristics during the investment years that stemmed from their childhood years. According to some of the parents and coaches, the athletes had determination, self-confidence, a positive attitude, a desire to learn and perfect skills, a good sense of humor, as well as an ability to focus, accept challenge, and deal with pressure and losses.

I think that she has a great attitude. I don't know if she was born with that attitude but this is her greatest asset as far as I'm concerned. You could ask her coach or anyone who's been around her a lot and they would say she's always had that attitude, even when she was young. She always gave everything she could. She didn't like to lose but she could handle a loss. She wasn't one of those people who got mad and so on. She would just decide that, "Next time, I'll do better or at least try." And that's probably why she's where she is. It's just her attitude and a few physical attributes that got her where she is. (PR4)

She's a perfectionist but she's also relaxed and funny and enjoys herself. She's always ready for a giggle. She would always be the one getting the team laughing and clowning around, and that helped her release the pressure. (PRI)

She just had all the ingredients. She would do whatever she had to do and she'd have fun doing it. She kept her sense of humor the whole time and was always able to laugh and enjoy herself and other people. I tried to push her to her limits all the time and she was kind of a natural in that way. Physically, she could handle a lot of work, and psychologically she would never give up. She would always keep working. Also, she naturally was very optimistic. I think optimism is really, really important. I'm naturally like that too so I think that the combination of the two of us helped carry that forward and build upon that strength. (CRI)

I think that one of her strengths was that she could handle pressure. It didn't affect her performance and it goes back to a young age when she would go to shoot out tournaments and Provincial Championships. I think that was one of her strengths that got her on the national team. But her performance is fairly consistent. Whether it's a low key game or a final game, she focuses very well. Crowd noises don't bother her at all. Part of it is also self-confidence. She knew that she could do the job. We always tried to instill that in her. (PC6)

She's not afraid to accept a challenge. I'll give you an example. If there's a new piece of exercise equipment in the gymnasium and it looks like a

death trap and everyone kind of holds back and says, "Oh God, I don't know what to do with that thing," she will be the first one to climb up on top of it to try it or figure out how to do it. That attitude carries over a lot to her wrestling. She doesn't wrestle like someone who wrestles to win. It doesn't seem like that's on her mind. She's fairly focused and intense and she just likes the fact of being challenged. (CC2)

1.4.2.3. Training

Several observations regarding the athletes' training during the investment years were made by both the parents and coaches. They confirmed the athletes' reports that training was very intense and involved extensive hours.

In his senior year, we gave him very, very stringent training. Sometimes, he would even train twice a day. He would go out on the weekends and train on his own. We didn't particularly care for him to do that because we wanted him to rest but he went and did it anyway. He did a lot of distance work. He would go out in the morning and would run about five or six miles and then come back. In the summer time, it was even more. He lifted weights mainly in the Fall when the track season was over and he stopped again in the Spring. (PC3)

We have a net at home and she used to go out and shoot a hundred pucks or balls a day in the net. (PC4)

After the first World Championship competition where she came in second, she set a goal to be the best in the world and committed to doing the work. She really put in a lot of time and effort and she developed from

a very talented and powerful wrestler who didn't have a lot of technical and tactical skills to a complete athlete. She has trained her whole game.

(CC2)

The last three or four years, it's been quite vigorous. She's in a year round program and that takes dedication, not only the aerobic but the strength development as well. They all worked pretty hard at that level. (PC6)

As soon as she realized that she could play on the national team, she joined a gym and started working out hard. She rented ice time and went to play games with the provincial teams she was on so she could get some competition and could improve as a player. She devoted a lot of her spare time to hockey like no other sport she was involved in once she got to that level. (PR4)

Two coaches also discussed their role during training at this level. One coach mentioned that C2 was knowledgeable and independent at this stage. She was a leader and made a lot of the decisions regarding her training and competitions. Another coach made this observation as well. She said that R1 had more input and was more confident as a result.

I think she has developed to a point where she's a fairly independent athlete. I don't think that I have to go to World Championships for her to be successful or to be prepared. She knows a lot about what's involved in the process. She's very well adapted and she is able to do the work on her own. She's at a point now where she can call her own shots in a sense, which I think is a good sign. I believe that the best coaches coach

themselves out of a position. If they eventually create athletes who are prepared, then the athletes understand what it takes physically, mentally, and technically, and they know how to reach their ideal performance state. I see her as a leader in that area. (CC2)

At the beginning, I used to tell her what to do all the time and then it evolved more into a shared thing. I was always in control of what the training would be but I would get a lot of feedback from her to adjust the training. I think that gave her some confidence as well because she felt that she was listened to and that she had some input. (CR1)

The aforementioned coach also pointed out that it was important for both her and R1 to feel good about the training and to learn something new every day. This corroborated R1's observation that she was a perfectionist and worked hard to improve her skills on a daily basis.

One thing that really helped was that every day, we felt good about the training. We felt that something positive came out of it even if it was really hard or if we didn't achieve what we wanted to achieve. At the end of the day, we always went home able to say, "Well I'm really glad I was there today and if I hadn't been, I would have missed something." I guess it comes back to believing that you are doing the right thing all the time. (CR1)

It is noteworthy that C2's coach confirmed the fact that she had a strong work ethic but he also added that she enjoyed strength training.

It has always amazed me how she really enjoys the strength training and things like that. I don't think she really looks at that as work. (CC2)

In the next citation, CR1 discussed the mental training activities in which R1 engaged at this level. These included visualization, relaxation, hypnosis, and competition planning activities. When these activities were introduced, there were more structured and supervised. However, as R1 and her teammates got more proficient at them, they did them more on their own. It is interesting that R1 mentioned that she did visualization but she did not elaborate on it like her coach did.

At first, we had fairly structured visualization training and we actually did some self-hypnosis with a lady. We did some really neat different things because we wanted to do something special that was just for us. We also wrote some scripts. We did some more meta-physical things. For example, for the duet event, they would think about a part of the routine and keep it in their head, and the other would have to try to figure out what part she was thinking of and be on that same wave-length. We'd do things like bring their heart rates down to a specific level that was ideal for them for the timing of the duet. That was in '84. Then, as they got more competent at it, it just became part of what they naturally did. It was not so formalized. So by '88, I didn't have to say, "Ok, sit down and write your script." We still had pre-competition plans and competition plans but they were much better able to do it. They just wrote down a few key words and things they had to do to get into that instant ideal phase that we wanted them to be in. (CR1)

In sum, the coaches and parents corroborated the athletes' reports that training was extensive and intense, and that some of them were more independent and in control of their actions at this level. One coach confirmed that mental training was important during the investment years.

1.4.2.4. Competition

The parents and coaches shared information regarding not only training but also competition. More specifically, one coach discussed the pre-competition routine and self-talk strategies that C2 used to get ready for her matches. Of interest is that he made the same observations as C2 did in her interview.

She tries to follow a routine. Early in the morning when she first gets to the competition site, she'll actually do some wrestling on the mat to get a feel for the venue and the match. She'll wrestle hard so it feels like she's already had a wrestling match and she's already into the tournament. This gets rid of a lot of nerves. Then about 30 minutes prior to her match, she'll get up and start to prepare and that's when she'll start utilizing affirmations and thinking about her opponent. If she knows that her opponent has a right leg lead, she'll be thinking about that, picturing her opponent having that right leg forward as she is warming up in order to be prepared to react appropriately. (CC2)

I remember taking her aside before her first World Championships and I wrote down three sentences for her on a piece of paper that she was going to use before her matches. She came back after and said, "Oh my God, I can't believe that it worked so well! It was like I was hypnotized. I went

out there and I wasn't worried about who I was wrestling or anything."

So that was a real positive tool for her. I say these same things to a lot of the athletes I coach but they don't do the same job of processing it or believing it. (CC2)

In the next citations, two mothers mentioned that they were happy when their sons won at the Olympics. They emphasized that the outcome of their performance was not as important as their happiness. PR3 said that she was as elated when her son won a silver medal at one of the Olympics as when he won a gold medal.

I'm sure you know that he was picked to win the gold medal in Barcelona in the individual event and a lot of people say that he lost. Well he didn't lose. He won a silver medal. I'm just as proud of that silver medal as I am of his gold medal. I just don't like the way the media handles some things. (PR3)

He was very satisfied after he won and when your children are satisfied, you are satisfied too. He was able to get sponsors after this so his future was almost assured. (PC5b)

One parent reiterated that post-competition evaluation was important at this level. He confirmed that his son spent considerable time assessing his performances after competitions.

He would analyze his race after the track meet was over. He was very, very technical. I think he used a lot of his engineering skills. He would ask himself, "Was I too close to the hurdle? Was I too far away from that hurdle? I want to know how come I hit that hurdle. Why did I hit it after

all this practice I put in? " In College, he hit the seventh hurdle and went down. He studied that hurdle so much that he has never hit it since. (PC3)

In sum, the environment in which the athletes trained and competed during the investment years was nurtured by supportive parents and knowledgeable coaches. The athletes possessed several qualities that helped them sustain the intensity and long hours of physical training. According to the coaches, mental training activities such as visualization and self-talk helped the athletes to prepare for competitions. Furthermore, getting a post-secondary education was important to most parents and athletes. The next section will focus on the athletes' transition from the investment to the maintenance years.

1.4.3. Transition from Investment to Maintaining Years

The athletes moved into the maintenance years once they reached the pinnacle of their sport, that is, once they won a gold medal at the Olympics or World Championships. The line graphs in Appendix J outline when each athlete made this transition. Note that C2, C4, C6, and R4 entered the maintenance years at a later time after having won their first World Championships. This was mainly due to the fact that they had a lack of experience competing at a high-level in their sport because there were not too many opportunities to do so. A table of citations illustrating the athletes' transition at this level was not included like in the previous sections because the citations in which they highlighted that they had won a gold medal at the Olympics or the World Championships were self-explanatory. Moreover, several of these citations are included in the subsequent section on the maintenance years.

1.5. Maintenance Years

The athletes entered the “maintenance years” stage once they reached the pinnacle of their sport, that is, after they won a gold medal at the Olympics or World Championships. At this level, they continued to invest a significant amount of time and energy to train for competitions. Their highly respected and knowledgeable coaches helped them to further refine skills and to develop strategies to deal with pressure and expectations. The athletes had access to several human and physical resources that alleviated motivational and effort constraints. Once again, their perceptions will be discussed first, followed by those of their parents and coaches.

1.5.1. Athletes

This section will focus on the athletes’ views regarding their context, personal characteristics, training, and competition. Although some factors were similar to those discussed in previous stages, additional ones that were perceived to be unique for the maintenance of their performance were raised. Their context will be addressed first.

1.5.1.1. Context

Several contextual factors that were discussed in the previous stages were also discussed at this level. These pertained to family, coaches, support staff, other athletes, equipment, financial resources, education, and employment.

1.5.1.1.1. Family

The athletes were asked to talk about the people who influenced them once they reached the top of their sport and several of them conversed about their family. Although family members were not as actively involved as in earlier stages of development, they continued to offer unconditional love and support through both good and more

challenging times. They believed in their children and their ability to succeed, and in turn, their children trusted them.

My dad, aunt, and grandmother went to the Nagano Olympics to watch me play so to they were certainly very supportive. When you put off getting a career like a lot of us have, knowing that your family is behind you and supports you, and does something like go to the Olympics is a big thing. You can believe in yourself and think positive all you want, but no matter how you slice it, there's still that element of uncertainty there. So it helps to know that people who have supported you all your life are behind you on those final steps too. (C6)

I have people back home, family and friends who are still always a big part of it. (R4)

I mostly rely on my husband for support. When I lack confidence, he gives some to me. It's just a matter of having the right people around you. (C1)

After all the setbacks I had at the Nagano Olympics, my parents were the only people I trusted. When I was there, I called them regularly to tell them that things were not going well. I knew they probably wouldn't be able to provide me with a solution, but talking to them made me realize that there were still people who believed in me and whom I could trust. They were far away but it was amazing to be able to count on them. (C5)

1.5.1.1.2. Coaches

Some athletes reported that their coaches were also very influential at this level. They relied on them for knowledge and feedback. One athlete talked about the benefits of being coached by her boyfriend while another reported having a new excellent coach during the maintenance years. Most athletes, however, had the same coach in both the investment and maintenance years.

My boyfriend who's been my coach for the last few years is really important to me. He went to the World Championships as the women's national team coach. Last year he wasn't the head coach but he came anyway and he was my coach in the corner. I find that it is really helpful to have him there as my coach just because I know he really cares about me and my performance. (C2)

I have had a new coach this past years and it's been good. I knew him and he definitely knew what we needed as individuals. I'm sure the work with the sport psychologist helped us to be comfortable with him. As a coach, you sort of know what your athletes need so throughout the year, I think he knew enough about us, the way we were, and what we needed to hear. (C1)

One athlete moved to another city to train at the National Sport Centre during the maintenance years. She noted a significant improvement in the quality of coaching she received there.

The coaching made a big difference to me because when I was on the ice here for one and a half to two hours, I was really learning a lot all the time. The head coach drove everybody to their level. (R4)

The next athlete said that he developed a special relationship with his coach that continued to evolve even after he retired from sport. This coach was extremely skilled in that he had an acute sense of awareness that enabled R2 to identify minute aspects of his performance that needed to be improved. The citation also suggests that they communicated very well and continuously learned from each other.

My coach was a good guy. He is my son's godfather. He's a tremendous observer. I would tell him what I saw after a run and he would say, "I think that's right but the back of your sled was just 10 centimeters off. You slipped." Normal people can't see that. We just worked on my inner picture and determined if what I saw inside the sled was really what he saw from outside. We learned so much from each other. He was my eyes outside of the sled and he was better than any camera. (R2)

The following athlete was the only one who discussed his dissatisfaction regarding the coaching he received at this level. Due to a lack of funds, he never had a personal coach. This sometimes affected his motivation to invest the quantity and quality of training he required to consistently perform in his sport.

I have a national team coach and also a strength coach who sends me training programs by fax that I follow by myself. But I never had a personal individual coach. I admit that it would be good because sometimes I need a kick in the butt. Some days, I don't have the will to

train. Whether I want to or not, I am always alone. Sometimes I look at others who have a personal coach and tell myself that it would be fun to have someone to coach me and help me progress. (C5)

1.5.1.1.3. Support staff

The athletes continued to work with other resources such as strength trainers and sport psychologists. The next citations illustrate how two athletes benefited from working with a performance enhancement consultant and a strength coach.

Luckily, I met this sport psychologist in February of 1993. He definitely helped me. He wouldn't want me to say that he helped but the discussions we had did. I'd say he helped me become a better person and put my priorities straight and this helped me to do the things that I wanted to do. It helped me figure out the difference between my relay swims and my individual swims. And then it helped me duplicate my relay swims in Atlanta. I put myself in an emotional state that was a duplicate of how I swam before relays most of my life. I'd never been able to do that before. I did that in my individual race and I did it on purpose. I swam the preliminaries, the finals, and then the relay, and I did it all three times. It was the first time I ever did it on purpose. It happened before but it was always by accident. (R3)

At one point, I needed to develop a more sophisticated muscle mass because I had some muscles that were off balance and I had to reinforce my tendons. So I have been working with a private strength trainer and following a fitness program at the gym during the last two years. It's a lot

of fun. Not that it's fun to lift weights but I am a lot more solid physically.

We also fixed the balance problem between my muscles. (C5)

The aforementioned athlete improved his performance as a result of getting extra help during training. It is interesting that he forgot to seek additional help when he was struggling at the Olympics. In retrospect, he wished he would have reached out more to support staff members who were accessible to him.

I needed help. I didn't know how to get rid of these frustrations and uncertainties. It's not like I'm this big macho guy who says, "I am not going to ask for help because it's wimpy." I am the type of guy who will ask for help when I need it. But I was so confused. We had psychologists and team leaders and managers. But I didn't trust anyone anymore because I felt like they were betraying me and I was completely lost. Some people appeared to be sincere but I even forgot to go see them. I didn't even think about any of this because I was just so lost and confused. (C5)

In the next citation, one athlete said that she trusted the exercise physiologists who designed her training program.

I can sit down and work with those who design my exercise program. This year, they were given the game schedule and made the training program around that so I trusted them. They hadn't worked with a women's hockey team before but they had trained athletes for the Olympics in a lot of other sports and had worked with our men's national team. I think it's a matter of trusting those people. (C6)

1.5.1.1.4. Other athletes

Once again, at this level, the participants relied on other athletes for support and continuous learning. They learned not only from practicing with teammates of the same or higher caliber, but also from examining how various athletes resolve challenging situations.

Just as far as support, my teammate and I drove out to Calgary together and lived together because she came out to do the same thing I did. So we were there for each other during that year, which was a transition for both of us to be training that much and playing that much hockey. Once there, I was going up against the best players in the world because eight or nine of us were from the national team. So I was constantly going against them, one on ones, two on twos and just doing that alone really helped. I had to improve my game otherwise I would have just gotten beaten all the time.

(R4)

I was always inspired by sport situations. Let's say I see an athlete who is facing an explosive situation, I watch how he will get out of it. I always look at what works and what doesn't work and then I apply it, even if the situation is not related to my sport. It's all relative. So I look at how athletes deal with situations and I learn from them. (C5)

One athlete discussed certain drawbacks of interacting with his competitors. After he won a gold medal, everyone else wanted to emulate him and he realized that he had to protect himself, his team and their performance strategies by not sharing any information because other athletes were trying to copy and catch up to them.

We are now entering a really difficult topic, the topic of high performance teams and people. At this level, they don't tell the truth anymore. I also started not to tell the truth anymore. I didn't want to reveal my secrets. But that becomes immoral. It's just a paradox. I wanted to be fair and open but then I saw that they were getting so close. I had to keep my mouth shut and be very secretive. But then they said, "You're not talking to us anymore." It made me feel very uncomfortable because I'm normally a social person. I like to help but I don't like to always be the one who does the work while others take the profit. (R2)

1.5.1.1.5. Partner

One athlete revealed that she started going out with someone during the maintenance years and he had an extremely positive influence in her life because he helped her maintain some balance.

I also went out with my first boyfriend who I actually married. I started dating him when I was 21 and it was really serious and that again was good because it was a distraction and it was balance in my life, whereas before it was totally one-sided. It was just synchro, synchro, synchro. I ate, slept, and breathed synchro. (R1)

Another athlete discussed the negative impact his girlfriend had on him when he prepared for the Olympics. Regardless of the mistakes he made, he learned some valuable lessons.

Last winter, I started going out with a girl and it certainly didn't help me prepare for Nagano. I was in love and it was interesting at the time but I

didn't train as much that year because I wanted to spend more time with my girlfriend. She wasn't the right girl and I didn't realize it. I was too in love. It was legitimate for me to be in love because I was 25 years old and I saw all my buddies who were in love and I wasn't. I thought she was the right girl and she wasn't. I learned a lot from her, probably what not to do again in the future. (C5)

1.5.1.1.6. Equipment

Some athletes discussed the importance of having access to high quality equipment in previous stages and this was as important during the maintenance years. The next citation highlights how one athlete sought help from the scientific community to design and fabricate his own equipment.

I knew about the engineering of runners and sleds so we constructed our own sleds. I had very good contacts with one big company in the scientific area who helped me to produce the runners. It was exclusive. I included in the contract that they were only to work for our team. I worked with them for four years and we had sensational products and good knowledge. The knowledge was secure and no one else could see what we were doing. (R2)

1.5.1.1.7. Financial resources

In terms of financial resources, some athletes had more than adequate funding while others only had the bare minimum. The next citation illustrates how one athlete secured a substantial amount of money from his federation and sponsors. Furthermore, he took advantage of the business aspect of his sport and turned it into a money making enterprise. On the other hand, the second citation demonstrates how one athlete struggled

to obtain an adequate amount of money from his federation, and his lack of desire to deal with sponsors.

It's also a business. I made a budget for the whole team. I had the income from the federation and the sponsors. I developed sponsor projects and organized everything and our budget went up from one hundred thousand to seven hundred thousand dollars per year. I also had the right contacts to help me. (R2)

It's hard because our team has a small budget. Our team is too big for the number of coaches we have and we can't afford to hire more. Considering the price it costs me to have a private coach and have him travel all over the world with me, I have to ask myself, "Is it really worth it?" I don't know, this is where I'm at right now. I eventually got some sponsors. If I didn't have this money, I wouldn't even have a quarter of the things I have now. I don't know what to ask of sponsors. I have no references. I don't know how much things are worth. I'm really not interested in the business aspect of it. I am too naïve for that. Sometimes, I look at how much money I can make so that I don't get screwed but it's just not my thing. (C5)

1.5.1.1.8. Education

Three of the 10 athletes attended university at some point during the maintenance years. As can be seen in the first citation, one athlete interrupted her studies the year prior to the Olympics when her team centralized to train on a full-time basis.

When we centralized to prepare for the Olympics, we were in a situation where our whole day was geared towards hockey. We didn't have to deal

with school so we had so much free time on our hands when we were not at the rink. We could do whatever we wanted to do. At times, that was a distraction but I found that we were often so tired that we would come home and just go to bed. (C4)

The following athlete also opted to take a leave of absence from school prior to the Olympics because she wanted to conserve her energy to prepare herself and she felt that school would have been a distraction.

This year, school would have been a distraction because people say that mental energy takes 60% of glycogen from your muscles. I couldn't afford to have mental energy going elsewhere especially during an Olympic year when there is a lot of stress. (C1)

Education did not only occur in classrooms. In fact, the athletes sought various other resources to stimulate and sustain their learning. Several of them read books and articles related to their performance in an attempt to improve it. One athlete reported that reading led him to engage in self-reflection and to develop mind skills that allowed him to be extremely effective.

I don't always trust what's here and now. I always doubt and go for new things. If I'm traveling somewhere, I go to bookstores at the airport and just look at what's in there. I quickly go through some of the chapters, take some ideas, and put the book back. Then I think about it. "Ok, that's an interesting topic. It's something that I should search more." I just kept my eyes opened. I tried to do everything that needed to be done to work on my own mind and thinking. I went to research institutes to get information on

brain development. I bought some audiotapes on self-hypnosis in '87. I also bought a book after the '88 Olympics about exploring the power of our unconsciousness. I wanted to learn to influence myself when it counted so that when I was on stage, I could influence myself and be an effective self-leader. (R2)

I often like to read biographies of athletes. I would say that I have always been fascinated by Gilles Villeneuve's biography because he is such an accomplished athlete. It was inspiring to see someone with such passion who always gave 100%. He always did his best and his passion brought him from nowhere to the top of Formula 1. (C5)

1.5.1.1.9. Employment

Five of the ten athletes worked on a part-time basis during the maintenance years. This enabled them to not only make some money but also to maintain a sense of balance in their lives. One athlete was working as a full-time teacher and decided to reduce her workload because it was too difficult to manage everything with her intense training schedule.

Last year was hard because I worked full-time as a teacher. It was just crazy because I was training and teaching at the same time and that was too much. So this year, I am only working half-time and it's perfect. I love my job. It's really a lot of fun. (C2)

I wanted to make sure that I had something other than synchro in my life so I found a job. That gave me added confidence because I realized that I

had other talents other than just holding my breath and turning blue in the face! (R1)

I worked part-time at the University of Calgary Campus Rec. Right now, I figure that I can still keep playing hockey for a while yet so if that means a few more years of part-time work experience here and there, then I'm willing to do it if that's what it takes. (C6)

In sum, the athletes' families were still extremely valuable resources at this level. Coaches also provided the necessary support, knowledge, and feedback the athletes needed to succeed, although one athlete wished he had his own personal coach. Many athletes found it helpful to learn from other people such as sport psychologists, exercise physiologists, the scientific community, teammates, and athletes from different sports. Finally, several athletes worked on a part-time basis to make money and also to maintain a sense of balance in their lives.

1.5.1.2. Personal Characteristics

The athletes reported possessing certain characteristics that helped to shape their performance during the maintenance years. Personal attributes such as self-confidence, motivation, and competitiveness continued to have a significant impact. Additional strengths included being independent and innovative, always learning and improving, and maintaining a sense of balance. The benefits of keeping a log or journal were also addressed by some of the athletes. The importance of being independent will be discussed first.

1.5.1.2.1. Independence

One athlete emphasized the importance of being independent and learning how to work on his own. His coaches helped him but ultimately, it was up to him to integrate all the information they gave him.

You have to be on your own because no one will help you when you're driving down. You are the only one who knows and can judge what you're doing. You have to know every detail and how to work. You can have tapes from the coaches or you can talk with them to analyze what the others are doing but you have to be able to integrate all this knowledge into your framework. That's the key. (R2)

Another athlete acknowledged the fact that he was in charge and responsible for his own actions. He never blamed anybody but himself whenever he was dissatisfied with his performance. Furthermore, his attitude was important in finding solutions to problems.

My destiny is in my own hands. Sometimes I was disappointed during my athletic career but I never blamed anybody but myself, except in certain extreme situations. I was responsible for my own actions so it was up to me to set some goals and to try to accomplish them. There was always a way to find a solution if I really wanted to and it all depended on the attitude or approach I took. (C5)

1.5.1.2.2. Innovation

A particularly significant theme that emerged at this level was the need to be creative and innovative. Three athletes discussed the importance of trying new things

during practice and competitions in order to keep an edge over their competitors. As World and Olympics champions, they were being copied, therefore they had to be proactive and develop new strategies and trends to maintain their positions. The next citations illustrate how this required perseverance, leadership, and an open mind.

I have been so innovative in my sport that I often taught my coaches. The sport is always evolving and it's important to make it evolve. Kids are putting pressure on us by coming up with new moves and we have to adjust to these new trends. I would say that the most important thing for me to improve my performance at this level is to try new things, to be innovative, and to always go forward. I have to keep trying, bang my nose, start over, and never give up. It's not always easy but I have to try and keep an open mind. (C5)

After the first victory, you enter another stage because what you did before is just out in the market and all the others can try to copy that. If you want to stay there the next year, you have to innovate and do something that no one had the idea to do. You can't copy others because you are now at the top. It's easy to copy but it's not very easy to have a good innovation. That was the challenge for me. At the end of my career, I was able to reproduce my performance in '92 and '93 but in '94, I felt like I had to do something new. I had to add potential. That year, I worked on leadership and enhancing potential in others. I also did a lot of personal reflection. I searched for new people who could give me ideas and for new

technology and science. It's just a question of gathering what you need and to do that, you need an open mind. (R2)

I always had to be innovative and come up with different things. My goal was to do the impossible and do things that people had never seen and no one else in the world could do. I wanted to make people remember who I was by doing things that shocked them in terms of my athletic ability. So that was my objective. It wasn't winning things, it was more wanting to do the impossible and wanting to make a name for myself in the sport. I was pretty much the one who would come up with new moves and then my coach would usually expand on them. She would say, "Oh yeah, that was really neat. Try this a little bit more." So I just went from there and things built off one another. Now I see moves that I created that kind of opened up a whole new element in the sport, and it is really neat to see that I was the one who started that. (R1)

1.5.1.2.3. Need to learn and improve

The athletes expressed a need to improve and learn not only during the sampling, specializing, and investment years but also during the maintenance years. One athlete noted the importance of identifying and improving weaknesses and of adopting a holistic approach in this performance enhancement process.

If I wanted to be better the following year, I had to think about where I needed to improve because winning is just a momentary state. Aside from my coach, I was the only one who knew what my strengths and weaknesses were and improving my weaknesses was key. It was really the holistic

improvement of my whole personality. At the end, everyone on the team had to be at a very high level and have the ability to work on themselves and get rid of their weaknesses. (R2)

I don't think that you ever stop learning. I always have the desire to learn and become better. There's always something more for me to do. (C4)

The following athlete was motivated to continue improving by the fact that she won a gold medal but not with the greatest performances. She thus knew that she could do better.

It's funny because I've won the gold but I didn't do it with great races. I was dominant all year by a large margin so as a driven athlete, I want to win with a great race. That's my motivation. (C1)

1.5.1.2.4. Work ethic

Having a strong work ethic was another personal characteristic that was discussed at this stage as well as in previous ones. Two athletes raised the fact that whatever they did, they always gave their best effort and tried to do an excellent job, even under the most adverse conditions.

Some of us had to go to the Gemini Awards after the Olympics to present an award and we got back from there at two in the morning and we had a fitness test that day. I hadn't done anything for two weeks so I thought, "Oh my gosh, I have to do a V02max!" Everyone was saying, "I'm just going to take it easy." And I said, "Me too." But I knew I couldn't and I didn't. I got on the bike and I went as hard as I could and I couldn't not give my best. I think that if you go out in practice and not give your best,

you can prepare for a game and not give your best, and then you're just not going to be your best. I have a hard time doing that because I just feel like I'm cheating. (R4)

Everything I did, I always wanted to be the best. Whether it would be in the water or with work, I always wanted to make sure that I was giving my best output and that it was my best workout. That has also transferred over to my work now as well. I just make sure that I really try to give my best effort. (R1)

1.5.1.2.5. Mental toughness

Two athletes elaborated on the importance of developing mental toughness to consistently perform at the highest level in sport. One of them discussed an extreme strategy he used to train his mind and body to fight under the most strenuous conditions.

We trained once with weights on our shoulders and went up a hill as far as we could go. It was just high intensity training. We were training our reptilian brain to go on until it really knocked us out. We also trained our emotions and fight and flight response. If you train like that, when you pick up these weights on your shoulders, normally you would flight. Your body or mind would unconsciously say, "You're stupid, why do you do this?" But we were able to consciously go to that deep level of mind and prepare ourselves to fight. It's not a normal thing but I don't think we were normal anyway to do things like that. The same took place when I was preparing for the Olympics in '92 and '94. One month before, I just shut out. I went in another world to prepare for a fight. I never accepted

the flight. It took so much energy to create that so I didn't get involved in things that took away my energy. I was always aware that the Olympics were near and that I would need all the energy to not flight there. It's just a question of resistance and that's what I think mental strength is about.

(R2)

I think being mentally tough was a big part of it. Once you reach a certain level, it's all about mental preparation, just being mentally tough, and always driving yourself even when the rest of you doesn't feel like doing it.

(R4)

1.5.1.2.6. Balance

Maintaining a sense of balance was another characteristic discussed by several athletes. As previously mentioned, some of them worked or went to school while they trained on a full-time basis. They also socialized with individuals outside of their sport. The following citation illustrates how one athlete ensured to engage in other activities besides her sport even when she was preparing for the Olympics.

I always had something on the side right up until the Olympics. I didn't just have synchro. I made sure that I had friends who weren't synchronized swimmers. I also got an education so that I had a backup plan in case I got injured and all of a sudden I couldn't do synchro anymore. Balance was really important. (R1)

1.5.1.2.7. Faith

It is interesting that three athletes conversed about their faith and how it helped them to maintain some perspective in their life. They believed that everything happened for a reason and remained optimistic about their future.

The world is like it's supposed to be and I'm in it and I'm where I'm supposed to be right now. I know it seems like a crazy way to look at things and sometimes people make fun of me. They call me black-white because if something bad happens, I turn it around and say it's the best thing in the world. Little things are easier to do and bigger things are a little more difficult but whatever happens, I always say it's the way it's supposed to be. We may not know why at this point but it's preparing us for something. (R4)

I was telling myself that it would be easy to have regrets and say, "Why did everything happen this year, an Olympic year?" But I don't want to live with any regrets so I tell myself, "Well, if these things happened, it's because they were meant to happen. There is a reason for this." Perhaps these struggles will give me enough energy to tell people that I don't want to be at their service anymore. I might be able to do what led to my success in Lillehammer. (C5)

Being a Christian athlete, I believe that I have a gift. I think that everybody has something they are special in and it's theirs to develop. Mine is speed skating. There will be a reason for me to do well and I'm going with it. (C1)

1.5.1.2.8. Humbleness

Humbleness was another characteristic that emerged from the interviews. Even if the participants were World and Olympic champions, they were extremely modest and down to earth. This is best illustrated in the following citation by a three-time Olympic champion.

I really don't consider myself a great swimmer. There is a whole history of great swimmers and it's tough to put myself in the ranks of the "Pablo Morales," "Matt Biondi's," "Mark Spitzes," "Buster Crab's" or "Gary Halls," and even going back as far as "Johnny Weismuller." And that's just partly a reflection of modesty, but partly, that's my reality. I'm a good swimmer and I know that. Although people might define me as a great swimmer, and certainly there's an argument right now for me being the best 100 back stroker ever because I held the world record for 6 years, I can't think of a single argument of me being the best back stroker or the best swimmer. Again, it's been an evolution. I think that I've always known I had talent in sport and I was good but I never had any epiphany where I looked at myself and said, "Oh my God, look at what you've done now." In fact, I always have a hard time even picturing myself as the world record holder. I think I'll be able to look back when I'm 40 and maybe I'll go, "That was pretty cool." Still that's very difficult. I like being me. The fact that I swam and was good at swimming and accomplished all the things that I've accomplished, it's just part of me. I don't label myself in any way because of those things. (R3)

1.5.1.2.9. Journals

Another personal attribute related to keeping a journal or logbook. Six out of the ten athletes discussed the use of logs or journals to keep track of their performance in training and competition. Two of these six athletes did not keep a journal whereas four of them did.

I don't have a journal. I have been told that I should but I am a math person, I just don't like to write that much. I just think about it more and talk about it a lot with my boyfriend, about why this is successful, about coaching and attitudes, and the mental part of it. (C2)

I don't really keep a log. My coach keeps one but I keep a lot of things in my head as far as my performances and my training goes. Of course it would not be very detailed but I can pretty much remember just about all the times that I have run for the last three years and I could also remember the type of training that I have done over the last three years. (C3)

I have a huge library of little details written down. (R2)

I would write down once every couple of days how it was going and tried to keep a journal of that to keep track of where I was going. (C4)

On September 7th, I started writing a journal because that's when we started the whole Olympic experience. Also, I started a brand new journal just for Day 1 of the Olympics until the end of the Olympics. I put down a lot of things that were going on and things that I felt and so on. I did

actually go back to look at some things and I think it does help to keep things in perspective. It's funny because sometimes you look back and you think, "What a horrible time that was," or "This was hard but I know it's going to make me a better person." So you learn a lot. I did keep a training journal before too and it really helped because I could see what I was doing, how I felt, and if I was doing too much. I could say, "Ok, I can't train that hard because when I do, I get sick and I have to give myself more rest." As you get older and go through it enough times, you get to know what you need. (R4)

In sum, the athletes possessed several personal characteristics during the maintenance years that led them to be independent, innovative, and mentally tough. They athletes nurtured their passion to continuously learn and improve and maintained a strong work ethic throughout the process. For some athletes, it was important to have some balance in their lives whereas for others, keeping the faith and remaining humble was personally significant. Recording events in a journal was also meaningful for several athletes because it allowed them to document their thoughts and actions throughout their career and during special moments like the Olympics. The athletes' training approaches and activities during the maintenance years will be the focus of the next section.

1.5.1.3. Training

Training was a crucial component of the athletes' daily lives at this level, just like it was during the investment years. Common themes that emerged from the interviews included physical, technical, mental, and tactical training. The athletes also discussed the orientation of their training environment, some of the changes they made, their schedule,

recovery activities, and personal needs to maintain their performance. Physical training will be addressed first.

1.5.1.3.1. Physical training

The athletes continued to engage in physical training during the maintenance years. Most of them followed structured and strenuous weight training programs that enabled them to develop the strength and power they required to perform their skills.

The weight program we were on in the summer made a big difference in my shooting. The weights were fairly intense through May, June and July. The first shot I took on the ice in July, it went right over the net. I thought, "These weights must be doing something!" I feel like I made the biggest strength gains this winter and probably the strength and power components are what I needed to work on the most. (C6)

It is noteworthy that two athletes reported changing their weight training program at this level, perhaps in an attempt to be innovative and to try something new. The outcome of these changes was not favorable but they learned some valuable lessons.

My coach changed my training format in that she got me off weights four months before the Olympic Games when I had been doing weight training all my life. That was a major drastic change in my training because all of a sudden, I was no longer doing weights and I had been accustomed to doing them all my life. I wouldn't have changed that because my body started changing prior to the Olympic Games. (R1)

I started training more like a sprinter with the notion that if I could run a faster 200m, then I would be faster in the 400m. They do a lot more weight

training so I increased my weight training a lot and I started doing a lot of deadlights. I felt I needed more power in my lower back and I realized that I was lifting too heavy and I was taking too long to recover. So it just did not work out well. (C3)

The next athlete revealed that he limited his weight training during the maintenance years, however he did it with great intensity. Engaging in high quality work necessitated both physical and mental preparation.

I didn't do too many squats but I did them at a high intensity. I knew that to maintain a high quality in squats, I had to first be rested and I had to prepare myself to do it. I could not go to the gym without preparing my thoughts for pain and I did that not just before training, it was part of my life. I would say, "This week, I will do it with 220 pounds. Even if I just do it once, I will do it." I waited the whole week until I felt that my body was ready to do it. I waited until I could stand up in the morning and say, "I'm feeling light and rested and today the energy is there. I'm ready to suffer. I'm ready to have pain today. I will do it today." I just went by this feeling that I would be ready to do it. Then I normally did it or came close to it.

(R2)

1.5.1.3.2. Technical training

In addition to engaging in physical training, the athletes continued to work on their technique because they knew they could always improve in certain areas. Most athletes refined relevant movements or skills, however, one athlete was dedicated to enhancing the technical aspects of the equipment he used, for example, bobsleds.

I was interested in the technical aspects of runners and sleds. I was really product-oriented and I organized everything that led to performing in that discipline. (R2)

If I wrestle the University guys, I can score once in a while but I get taken down most of the time. So it is really easy to be humble because there is still a lot I can work on and technically I can improve a lot more. I have to work on my ground wrestling just because I usually score most of my points standing. So it is a new challenge! (C2)

I think I can improve my shooting. It's just one of those things that I could always work on to improve my game. (R4)

1.5.1.3.3. Mental training

Mental preparation was also important during the maintenance years. Common themes that emerged pertained to goal-setting, imagery, positive thinking, and awareness. The athletes continued to set short-term goals to improve minute aspects of their performance as well as more long-term goals, such as attending the Olympic Games. These goals gave them the direction and energy they required to not only maintain their status but also to keep enhancing their skills.

We set goals. I told them, "All the testing data we did the year before must improve from four to five percent. Everyone has to be faster in sprinting, better in jumping, and have better results in weight lifting. Everyone has to improve." That's what we had to do to maintain our level because if we would have just done the same job the following year, it would not have

been good enough because all the others were doing that too. The key was to do a little bit more to be ahead of the others. (R2)

We practiced every day, so often before practice, I would just set one or two goals and decide what I wanted to do for that practice and try to accomplish them. (C4)

I don't see myself stopping now. First of all, I don't feel like stopping and also, I wouldn't want to end on this note. I feel like I haven't gone all the way yet. I still have a way to go and this will bring me other things and allow me to grow more. So I'm going to keep going but this time without all this pressure. If I make it to the Salt Lake Games, I'm going to be more mature than I have ever been to face this challenge. We'll see what happens! (C5)

Visualization was another mental skill that was used and refined by several athletes to complement their physical and technical training. According to the following athlete, it allowed her to feel more prepared and confident.

As an individual player, I learned that I play so much better if I do a lot of mental preparation. Like a lot. If I draw things out and then do visualization, that way I go in feeling more confident. I just feel ready. So I've learned over the years what I need to do in that area. (R4)

It is interesting to note that one athlete engaged in so much imagery that he sometimes had difficulty stopping. He could not consistently control his thoughts and this in turn exhausted him. He was aware of this problem and tried to regulate it.

I had very good inner videotapes of the tracks but sometimes I couldn't turn them off or stop doing them at night. I had some mental weaknesses. I just burned out sometimes by doing too much imagery and focusing. Sometimes I slept 14 hours and then I slept only 5 hours and I was not very constant in my behaviors. I tried to keep my body in shape but I also tried to improve my mental side even more and become constant there.

(R2)

The following athlete revealed that he constantly thought about his sport and imagined various scenarios while incorporating many senses. He did not, however, use specific imagery techniques or engage in any formal visualization process. This suggests that imagery, or using your imagination as he referred to it, can be beneficial when it occurs spontaneously and in an unstructured fashion.

I didn't always get the type of emotions out of using my imagination that they say you're supposed to get. A lot of times using my imagination just meant going through a brief little period of my race. It might have just been imagining how I was supposed to feel. I'd say I never went through my whole race as part of the visualization process. I couldn't get through it. I don't know if I don't have the patience to go through a 54 second race in my mind or what but I couldn't do it. When I was using my imagination, it was happening by accident. I never sat down and said, "OK, I'm going to imagine my race." It always happened when it happened. Actually, most of the time it happened during my workouts. I did get some strong emotions a few times, even to the point of bringing myself to tears, just

imagining myself. I thought a lot about swimming. I used my imagination a lot in reference to swimming, everything from trying to think of new techniques to how I wanted to feel in the water, to different workout sets and that sort of thing. So I was very cognitively engaged in my swimming but at the same time I don't think I ever used specific techniques. (R3)

Another mental skill that contributed to one athlete's success was being positive. With the help of her boyfriend who was also her coach, she developed strategies to maintain a positive mindset and remain in control of her thoughts.

My boyfriend is a motivational speaker. That is his job. He talks to kids about making good choices, being a good person and that sort of stuff. We have been living together for the last few years and just having him in my life has really helped because he is such a positive person and he just helped me become positive. I think I was already positive but I learned how to take charge of my own thoughts. I feel that he is the one who gave me the formula that led to my peak performances at Worlds, which is when you have to peak or have a good showing. He talks about the process and not the results. I think it is because of that that I have been successful.

(C2)

One athlete discussed the importance of being extremely aware of his environment and his personal needs to perform. This acute sense of awareness that he developed after many years of conscientious training allowed him to be more intuitive and to take more risks in pressure situations.

I became very sensitive to every little detail or change in the tracks from one minute to another. I tried to adapt my driving style but that really drove me crazy sometimes because I was always a little bit behind. I could prepare but the ice sometimes changed after one minute. I couldn't analyze the track and then go up and expect that nothing had changed. At the end, I really didn't depend on my analytical skills that much because they were just not good enough to experience reality and reality is when I go down. I had to train my awareness. At the end, I was working on just being more aware of what was really going on, especially in high speed situations. I had strong analytical skills but there was another step, intuition, creativity. I had to try things and rely on my intuition. I had to trust it and apply it in competition. This required courage and taking high risks. I focused more in training and at the end of my career, I saw every little detail when I was driving down. I saw every line the others were driving. I never saw that when I started. It took a lot of development to get to that stage. (R2)

1.5.1.3.4. Tactical training

The athletes did not discuss tactical training at length, however, the next three citations illustrate that some athletes believed they could still improve this aspect of their performance.

If I am going to score on someone, I have to set it up. There are different tactics I can use to score on an opponent and that is what I have to work

on. If I score on some of the good guys I practice with, I know I have done a really good job. (C2)

I try to be more versatile on the ice, play different positions, and learn the game so that I can adjust to different things in game situations. (C4)

Reading the game is a big part of hockey and I could always improve this. (R4)

1.5.1.3.5. Orientation

The training activities in which the athletes engaged during the maintenance years were designed to not only maintain their performance but more importantly, to improve it. At this level, training sometimes involved more hours, but for the most part, it was more intense and it focused on quality. The next citations illustrate the high intensity with which the athletes trained at this stage of their career.

Between '92 and '94, I didn't train that much but if I trained it just knocked me out. What I did was sprint at the highest possible level. I prepared my mind to really go for it. If I did a 30 meter sprint, I first did it 10 times through imagery, every step. Then, I did it and I timed myself. I tried to improve both my time and the quality of my movements. I really wanted to consciously experience every step, lengthen my steps, push as hard as I could, always be in the present, and just try to push my limits. After doing 30 meters three times, which is not much but if you do it at a high level, your muscles are really out, then I did another 80 meters at a good speed and with good technique just for resistance. I didn't push so hard but I tried to have high speed processing in my movement. Then I

sometimes did one, two, or three 150 meters just for my heart capacity.

That for me was sprint training. (R2)

Basically the big thing was just to get better and that meant being on the ice more and training harder, and doing everything harder than we did before. Personally, I just stepped up the intensity of the training program.

(C4)

Our off-ice training was done as a group and it was a pretty intense program as well. So in some senses, it was stepped up. (C6)

The next athlete revealed that she was often fatigued due to the frequency and intensity of her workouts, however her body and mind adjusted with time. She developed mental toughness to cope with the demands that were placed upon her.

In regards to my preparation for the Olympics, I don't think it really changed from Worlds. It just became more constant, a daily basis thing. I learned to deal with the physical fatigue that my body went through, which was a huge adjustment. It took a couple of months to realize that, "Ok, now I am tired, but maybe when I thought I was tired before, I wasn't." I found out how much fatigue my body can handle. (C4)

The following citations illustrate that quality was of the utmost importance at this level. Even when training conditions were not optimal, the athletes did their best to get something out of their practice sessions.

It was one or two more hours but I would say more quality hours. I think that the time and commitment was already there, it was just a matter of

getting better. For example, if I didn't feel good one day, I pushed myself in the weight room or even on the ice. If you are absolutely dead, I believe that 45 minutes of intense hard practice is better than an hour of crap. If my mind was just not there anymore, if I was mentally drained from school or exams, I would just go have a hard 45 minute practice, do my weights, and get in and get out to stay fresh. Some days when I felt tired, I told myself, "You have to stay on the ice for an hour and a half and suffer." So it was up to me. But it was quality that was most important. (C4)

The stage I'm at right now, I don't need quantity anymore, I need more quality. Training a lot of hours gets on my nerves. It just gets to be too much after a while. So one way I ensure quality is I don't waste any runs. Every time I go down, I give everything I have. I try to perfect difficult moves so that they will eventually become second nature. In reality, I try to stretch my limits. This is what quality is about. It's trying to improve a little bit each time. It's doing less runs but investing more energy and being more tired more quickly. I'm satisfied with keeping practices short and sweet and this way I have the desire to go back the next day to do the same thing, without being too beat up from the previous practice. (C5)

I think that you definitely need the quantity of being on the ice five to six days a week, but at the same time, you do need the quality. I know as a goalie, if I'm not challenged by who is shooting on me, I'm not motivated and focused on being there. So in that sense, I need the quality but at the same time, it also has to be quantity too. If it's not quality and there's lots

of quantity, then I'm going to get bored with it that much faster. I think to maintain and to keep improving, we definitely need both elements. (C6)

As the leader of his team, the following athlete was concerned about being a good role model for his teammates and demanded high quality work from them. Mediocre work was not tolerated.

I tried to lead my team on the view of quality. When they prepared the runners, I would tell them, "If you do it, please do it right. If you don't have the time to do it right, then leave it because bad work will harm us. It's better to do no work than bad work." I tried to be a role model and do good quality work on my own. I knew that if I picked up my energy and focused on learning and doing good runs during training, the whole team would follow. (R2)

1.5.1.3.6. Change

Training with intensity and quality was important, however, some athletes experienced the need to make more drastic changes in their training environment during the maintenance years. For two athletes, moving to another city to train was positive because it allowed them to work with excellent coaches and to continue growing and developing skills.

I never really changed the type of stuff I was doing. The only thing I did differently between '92 and '96, in addition to the stuff that the sport psychologist taught me, was I left Stanford for nine months and went to Phoenix Arizona to train with a different team. I felt like I was getting stuck in a rut at Stanford. I wanted to get away from the team. There's that

reason and there are a lot of other reasons, none of them bad necessarily. I just felt like it was almost a time to get refocused or re-energized and to get some different input from a different coach and different swimmers. My plan was then to come back to Stanford with some new ideas and feeling kind of refreshed. And it worked great. So that's the only different thing I did between those years. (R3)

Last year, I took a leave of absence from my job and moved to Calgary so I could train here at the Oval with the high performance hockey program. I could have stayed in New Brunswick and played with my team but I knew that for me to have the best chance to still be part of Team Canada, I had to get on the ice a lot more. I had to be training and I needed to get the best coaching. (R4)

Some athletes made changes that did not lead to optimal results. The next athlete decreased the number of hours he trained because he wanted a break. In retrospect, he admitted that perhaps he should not have done this the year before the Olympics.

Last summer during an Olympic year, I decided not to ski because I was fed up of skiing and I didn't feel like it. I regretted it a bit but I had a choice to make at that time and I was sick of skiing and spending all my summers in the snow. I wanted to see grass and to be in the sun. So I decided to do one training camp out of three. I did a lot of physical training during the summer but unfortunately, I didn't do enough technical training, like with skis on the trampoline. I tried to do what another famous athlete often did at the end of his career. He didn't do a

lot of training with skis during the summer. He did it more during the Fall, but he did it with intensity and purpose. So I decided to try this but it was an Olympic year and a lot of people were upset with me. I just ignored them and listened to what my body was telling me to do and it was telling me to slow down a bit. (C5)

Although the aforementioned athlete did not entirely benefit from changing his training schedule during an Olympic year, he reported that variety was important because it helped him to stay motivated and to challenge his body to resist the comfort of a particular routine.

In a sense, it was good to change my routine because at one point, I realized that always having the same routine was not necessarily the best thing for me. I had to change the intensity and volume of my training so that my body didn't get too set into a routine. It's important to change. The program I am following right now changes every three weeks. (C5)

As mentioned in the section on physical training, one athlete's weight training program was altered before the Olympics and she was not comfortable with this change. Instead, she wished that her coach would have decreased the number of hours she trained because she felt burned out and as a result, she did not enjoy her sport as much as she did before.

I was 21 when I reached my peak at the 1986 World Championships. I was at my best. I was doing things that people probably still wouldn't be able to do today. But I was pretty much then just maintaining my level until the '88 Olympics. I wasn't getting any better. I was training the same amount.

I don't think I needed to train so many hours because I wasn't enjoying it quite as much and I was starting to get a little bit more burned out from it. In retrospect, although I was very successful in Seoul, I think I could have been better if I maybe had a little bit more rest. (R1)

As previously mentioned, another athlete changed his weight lifting program the year after he won a gold medal at the Olympics. However, he did not obtain the results he had anticipated and decided to revert to his previous program.

I didn't run as well in '97. I made some changes because I thought they would have helped me improve but they ended up making me run a little less efficient. Experimenting with different training methods is something that I am always worried to do because there are so many ways to do it. You can ask two experts in track how to train for the 400m hurdles and they will tell you totally different things. I used '97 to experiment with different training methods and it did not work out so I am going back to what I did in '96. (C3)

1.5.1.3.7. Schedule

The athletes' training schedule for the maintenance years is outlined in Table 11 in Appendix L. It can be noted that seven of the ten athletes trained approximately the same number of hours as in the investment years, although two of these athletes reported reducing their number of hours for a certain period of time between two Olympic Games. The three hockey players slightly increased the amount of time they trained, particularly when the national team centralized for five months prior to the Olympics.

1.5.1.3.8. Recovery

Long and short-term recovery during the maintenance years appeared to be important to several athletes. Two of them took a break for a more extensive period of time after the Olympics. They decreased the amount of training they did and also took advantage of this period to engage in activities outside of their sport.

The first thing I did after the '92 Olympics was I took a big long break. I took about six weeks off and just didn't swim. I put on 20 pounds and just drank a lot of beer and partied. And when I got back to school, I started swimming again but for an entire year, I didn't set any goals and I didn't put any pressure on myself. I went to work out when I wanted to. I was probably missing two or three workouts a week on a fairly consistent basis and it was just not like me at all. I did that because I knew I had four more years of swimming until the '96 games. I wanted to give myself a break to be able to do the things that I usually didn't get to do so that in the final three years before the Olympics, I could really settle down and get serious. Really, I did it just so I wouldn't burn out. So I didn't start to really get serious again until a year after the '92 Olympics. (R3)

On a more short-term basis, most athletes allowed their body and mind to recover by taking daily naps or engaging in relaxing activities. Some athletes mentioned that they wished that had more time to rest.

I was at the rink at 8:00 a.m. and went home from 12:00 to 2:00 p.m. to have lunch and maybe a nap. Then I went back to the rink from 2:00 to 6:00 p.m. and then I was generally free unless we had team meetings, and

at the end, we would have them three nights per week. I would sleep between 8 to 10 hours per night which is what I needed, then got a nap if I needed it in the afternoon. I would get Sundays off so I had one full day to rest, which was nice. When we started to travel, our rest time was cut down significantly just from being on the road for two weeks at a time. When we came back, we always had two days off. One of the things the team would do differently next time is we would have more rest days. (R4)

I would go home every day and nap 30 to 45 minutes, maybe an hour depending on how I felt. It was just nice to have that option. Then I would go to practice and found that my energy level was way up compared to last year when my day was booked solid. At that time, I would go to practice and all I would think about was going home to sleep. I just wanted to sleep so bad, and now I don't have to deal with that. (C2)

I was up at 4:45 in the morning so I would usually have an hour and a half nap in the afternoon between both my practices. That's if I wasn't going to school. Then I would go to bed at 9:30 at night. You can see why I didn't have a social life. But I'd always try to go out on Saturday nights to party and have a bit of a life. (R1)

The aforementioned athlete revealed that she was tested on a regular basis and the results sometimes indicated that she was overtrained. In this case, she would have more resting periods. She mentioned on a few occasions during her interview that she wished she would have had more time for recovery.

Sunday was our day of rest and then it was back to the swimming pool and doing the same thing over and over again. We were being tested on a regular basis. They would check the lactic acid in our blood and that would determine if we needed rest or more work. At one point, it was determined that we were actually overtrained. The exercise physiologist was almost our savior because he then gave my coach shit and told her she didn't need to train us this much. So then we would occasionally have an extra day off which was great. In retrospect, I think that I came from the era where there wasn't much known about overtraining and I think it was quite common to see it. I think coaches are much more aware of it now. (R1)

According to the next athlete, recovery was extremely important because it allowed him to maintain a high quality level of training. It was also crucial for him to be able to quickly regenerate his body and mind between runs during a competition. Mastering the ability to recover in all areas of his life appeared to be one of his goals.

For me, at the end of my career, the art of being in shape in high competition sport was to be a master of recovery and being able to recover more quickly between my four runs and also in my whole life. If you want to keep up quality, you have to master recovery. (R2)

1.5.1.3.9. Personal needs to maintain performance

The athletes were asked what they needed to do to maintain their performance at this level. Although their responses varied, there were common elements that emerged. As previously mentioned, some athletes discussed the importance of getting adequate

rest. Focusing on the quality of training while maintaining similar number of hours was also perceived to be important. Furthermore, the need to continue improving technique and tactics and to be innovative was raised and previously discussed in this section.

Following are additional responses that shed more light on the maintenance process.

One athlete revealed that it is much easier to maintain her performance now because she has already won several gold medals. Competition results are not a priority in her life anymore and this allows her to free herself from the external pressures that are placed upon her to succeed. She is now more motivated and challenged by the process of performance.

I still want to do the best that I can do. I have won Worlds each year and that is good. But each year, it's a different tournament so it is just new challenges. It is easier for me now I think. I have already done it so I have nothing to lose. I just go out and do the best I can and if I don't win, well I'm happy with the fact that I have already won three times. I still want to keep winning but it is not a priority. I think that I can win that way by not focusing on the gold medal and just going out there and wrestle a real tough match. That is my goal, to just be a tiger out there. I think that by just focusing on that and taking the pressure off, then I can have those performances. And if it happens it happens. So far it has been happening because of that I think. (C2)

According to another athlete, surrounding himself with a group of competent individuals was important to maintain his level once he reached the top of his sport. As

the leader of his team, he engaged in various organizational and training activities that were aimed at perfecting various minute aspects of their performance.

I built up an environment of 20-25 people and I was at the center of that. I was pulling the strings, organizing things, and training at the same time. It was demanding. I was always trying to do things better than the year before and being a little bit ahead of the others. (R2)

All three hockey players mentioned that being on the ice as often as they could was extremely important to maintain their performance. One of them said that it was important for her to prepare individually and as a team.

After the '95 and '96 Worlds, I just had to keep getting better. We played the US so many times that every time we played them, the gap kept getting less and less. It was a little frustrating in the sense that our national team was never together before a World Championship for more than two weeks. So it was really up to me to get myself prepared so that when we came together as a team, we would just work on the team stuff and not individual stuff, so that everything would just flow. That is what made us successful because everyone went back to their club systems or teams and tried to play as much as they could. (C4)

The next athlete recognized the benefits of training with the national team for an extended period of time prior to the Olympics. Getting the opportunity to train with other elite athletes appeared to be crucial to maintain and continue improving her performance.

For me, it was just making sure that we were on the ice. We had the chance this year to bring the best players in the country to train together

every day. I think we all improved that much more over the course of centralization, just from being in that kind of environment. (C6)

One athlete mentioned that she needed to continue training the way she had been during the past year because things were going well for her. At the time of her interview, she had just won a gold medal at the Olympics so everything was extremely positive in her life. Although she wouldn't change her training activities, she admitted that she could improve her races by staying relaxed and acquiring more competitive experience.

I would sort of stay in the same direction and keep working on the same things I'm working on. I don't think I can overanalyze or change much. I do need to have more perfect races, well, perfect never happens but good races. I need to get into that state and get relaxed. It's not more training. For me, it comes down to experience. (C1)

In sum, the quality of the athletes' training appeared to be extremely important during the maintenance years. Most athletes trained the same number of hours as in the investment years, however, a few trained less for a certain period of time in order to take a break. Working on technique and tactics was instrumental, as was using mental strategies such as visualization and goal-setting. Although the athletes had reached the pinnacle of their sport during this stage, their training activities were still aimed at improving their performance and most importantly, the consistency of their performance. The next section will focus on the competitive environment of the athletes at this level.

1.5.1.4. Competition

Competition during the maintenance years usually involved preparing for and attending high profile events like the Olympics and World Championships. This section

presents some of the strategies the athletes used to get mentally ready to compete, deal with pressure, expectations, and setbacks, and to engage in the process of performance.

1.5.1.4.1. Pre-event preparation

The athletes' preparation before competitions involved developing an appropriate mindset in order to minimize pressure, keep things into perspective, and stay in tune with the process instead of the outcome of events. The athletes also prepared by engaging in self-talk, relaxation, activation, focusing, and imagery activities, which helped them control their level of intensity and performance. Resting and conserving energy were also important aspects of their preparation.

Just like in the investment years, several athletes mentioned that they adopted a certain mindset prior to the Olympics and World Championships that allowed them to reduce the pressure and keep things into perspective. It was important for them to approach these events the same way they did any other competition.

In '95, my goal was to run the best I could in the World Championships so I trained at 100%. When the Olympics came around, I trained the same way. I really can't concentrate on all the popularity and attention the Olympics get. I just have to keep running the same way I always run. If you look at the performances of track and field athletes when they go to the Olympics, they don't really run too much faster. I ran a 47.5 at the Olympics but I have also ran that in the past so you just have to see it as another race. To the world, it is a big deal but as an athlete you just have to see it as another lap around the track and just do the best you can. (C3)

We didn't approach the Olympics any differently than the World Championships. We took it as a short-term competition because it is. It's only a couple of weeks. So we looked at it that way because we had been so successful in the past when the championships were that long. There were certainly things throughout the year that were more difficult, like all the attention and the media hype. But as far as the actual tournament itself, we went into it very well prepared. There is no doubt about it. (R4)

Keeping a sense of perspective also allowed one athlete to maintain some balance in her life as she prepared for the Olympics. She reminded herself that her sport was only one aspect of her life and that her hard work would pay off in the future.

I think perspective was important throughout the whole experience because there were times when I would be so involved in just hockey. I guess I kind of got run down or mentally burned out. I had to keep perspective of what I was doing. I would tell myself, "Yes these are hard training sessions but in six months, they are going to pay off." Or, "This is just a game so don't take it so seriously. Don't get so caught up in it." (C4)

The following two athletes mentioned that they tried to put themselves into a frame of mind where they could free themselves to perform and have fun. They embraced the challenge of purposefully making things happen during competition. In doing so, they had to take risks and not be afraid of the outcome of their performance.

I hope I can continue putting myself in the same mind frame where I am not afraid of losing. At Worlds, I just thought, "I am just going to go for it

and have fun,” and it was really cool. That is when wrestling is the most fun. To be able to do that when you are at the biggest competition of the year is key and I am really happy that I have experienced that. (C2)

I figured out how to regularly put myself in a state of mind before a race that gave me the freedom to swim the way I wanted to swim. I learned how to make things happen on purpose rather than let them happen by accident. (R3)

One of the ways that the aforementioned athlete was able to free himself to perform the way he wanted to was by realizing that his family was his priority in life and that losing a race would not make him a lesser person. He minimized all internal and external pressures by remaining relaxed and indifferent to the results of his races.

I would say first and foremost, I needed to be relaxed and almost uncaring of the result of the race. But in order to be uncaring of the result, I had to be able to look beyond the result and understand that really the result of the race didn't matter. It was important to me but the way I made it matter in my head is by realizing that my priorities were with my family. I also realized that I was a really good swimmer but I was a really good person too, and the people who were important to me didn't give a shit about how I swam. They wanted me to swim well because they knew I wanted to swim well but they weren't going to judge me if I didn't. Those who did judge me because I didn't swim well, I didn't care about. (R3)

Self-talk was another strategy that was utilized by all of the athletes during both the investment and maintenance years. It helped them to remain confident, focused, and

motivated as they prepared for competitions. Some athletes talked to themselves more frequently and in a more structured fashion. For example, the following athlete identified certain statements that she repeated to herself over and over again before her matches. She reminded herself how important her family was to her.

It was just an amazing experience because about half an hour before the match, I was just doing a lot of positive self-talk and I was in such a good mood. I was talking to myself and saying that I was just so lucky to be here at Worlds wrestling for my country. I was just thinking about all the positive things that had happened to me. I have had so many great things in my life so far that have happened because of wrestling that anything else is just a bonus. I was really excited that I would get to wrestle this challenging athlete who was going to be strong and who was going to be great, and I wanted the challenge. I was not worried about the results at all, which is amazing because after all, these were the World Championships. I thought about the things that were really important in life, like my family. I knew they would be behind me no matter what happened in the match and that my boyfriend would be happy and still love me. I just thought that this was an opportunity for a great experience to happen. (C2)

This athlete also mentioned that she changed her self-talk statements after a while because they eventually lost their effect. She also developed the skill of changing negative thoughts or statements into positive ones.

I changed my self-talk statements because I had been using them for a long time. I used those at the beginning and then after a while I found that they were not working as well because they had lost their power. So I changed them and last summer I was saying things like, "What a great opportunity this is." I just kept talking to myself about positive things and if anything close to negative would come close to my mind, I would quickly say something positive and would not let it distract me. (C2)

The following citation includes another example of how one athlete used self-talk to deal with less than optimal conditions during competition.

Because I practice an outdoor sport, I remain neutral about the changes in temperature. I'm used to training when it's sunny outside but I prepare myself to not panic when there is a cloud in competition. I tell myself, "Well, today we're going to race in the rain. It's no fun but it's the same for everyone." This way, I don't waste my energy complaining about the rain because ultimately, it's part of the sport. (C5)

Regulating the level of intensity with which the athletes competed was extremely important at this level. Some athletes used relaxation or activation techniques to reach an appropriate level of arousal to perform. As can be seen in the following citation, one athlete used self-talk to relax himself before his race at the Olympics.

The difference was that for most races, I had to really psych myself up but for the Olympics, I had to calm myself down because of all the attention the Olympics were getting. So I had to tell myself to relax a little bit more. But if I want to psych myself up, I look at past races for inspiration. I

listen to loud music or anything that will wake me up and kind of get my nerves on edge before my race. (C3)

Another athlete revealed that the environment in which she competed influenced her level of intensity of play. It was easier to be intense when she competed with the national team because the players were of higher caliber and they were excited to be there. This was not always the case when she competed with her club team.

I think my preparation is always constant, it's always the same, nothing really changes. But when the national team gets together, the intensity steps up quite a bit because we are just with better players and we are excited to be in that situation and that environment. Everybody is so happy to be there and wants to be there. I don't always get that when I'm with my club team and it gets a little disheartening. (C4)

Two athletes talked about the importance of focusing on what they had to do at the Olympics and not paying attention to distractions like competitors and results. According to the next athlete, he learned that it was best to only focus on the things he could control.

I think one of the things that made me a good competitor is that most of the time, I didn't care what other people were doing. I did a good job of just swimming my race and doing my job. The toughest times were when I was worried about someone next to me or trying to beat someone next to me or I really wanted to win. For me, the best thing that I could do was just relax and swim my race. That was really all I could control, so that's all I worried about. (R3)

As can be seen in the following citation, one athlete got severely side-tracked at the Olympics and was not able to regain an appropriate focus to perform.

The Olympic Games are an amazing event. You have to get there feeling rested and well-prepared and you can't lose sight of your goals. You have to put everything that's irrelevant aside to be able to focus on what you have to do. For me, it is skiing moguls so I focus on skiing moguls.

Unfortunately, I wasn't able to do this in Nagano and this made me panic.

I was trying to get into the same beat as before but I couldn't. Based on my previous success, I knew that I didn't have the right attitude. I just didn't know how to get back on track and this frustrated me even more. I wasn't mentally fit enough to shake myself and say, "Come on, wake up! Get back to your routine." I needed someone to tell me. Even if I had the answer inside of me, I wasn't able to get it. (C5)

The following citation illustrates a strategy that was developed by an athlete to regain her focus during a game situation. Of importance is that she gave herself some time to express her emotions and to reconnect with the present in order to plan what she had to do next.

Sometimes if I am getting frustrated in a game situation, one of the things that I try to do is come off the ice to take 30 seconds to be kind of mad and 30 seconds to be back in the present and to think of what I am going to do next. That is ideally what I try to do most of the time because generally during the game, I just react. But if I do think about that, then it helps me to get focused. So if I lose my focus, I can get back into it. (C4)

Imagery was another technique that was used by several athletes to optimally prepare themselves for competition. Again, the use of imagery was prevalent in both the investment and maintenance years. It helped some of the athletes to review skills and tactics and to stay familiarized with important elements that came into play during their events.

I usually do my visualization in the morning because when I get to the rink, I don't like to think about anything. So I wake up in the morning and spend 15 minutes at the most just laying there and thinking about different things. I also usually rest in the afternoon so I will sleep for an hour and wake up, put my walkman on and just try to visualize some of the good things I did in the past game or just things in the past. I also try to watch a lot of NHL games and observe what the great players do and then I try to visualize myself doing that. I don't think that I am hung up on doing a lot of visualization but I do quite a bit when I am not at the rink. (C4)

When I get to the competition site, I take the time to really study the moguls and examine where they are situated. I don't retain everything but I want to have a general idea so that when I visualize, I know the exact course I will follow. (C5)

As can be seen in the following citation, visualization can sometimes be detrimental if the images created are not positive and controlled. One athlete often preferred to talk to herself in her mind because sometimes she had negative images of being beaten by an opponent.

I find it easier not to see and just do the talking because sometimes I see myself get taken down by an opponent, which does not help my performance. So I visualize positive things but it is often easier to talk than to visualize. (C2)

Another athlete revealed that his visualization was enhanced when he visited his competition site ahead of time. He completely familiarized himself with his environment and got ready for any possible situation.

I try to limit as many unknowns as possible. That's why I like going to the competition site one year in advance if I can. I familiarize myself with the environment, take pictures and memorize as many things as possible. I study the trees, the slope of the hill, how long it takes to go up the lift, everything. I imagine what it will be like with a crowd. Often I will walk up to the top of the mountain, just to see what's on the other side. When I'm at home trying to imagine things, I know what to do and what to expect because it's not an unknown site anymore. (C5)

Finally, pre-event preparations involved rest. According to the next two athletes, it was important to not waste any energy and time before a competition. They refrained from doing any strenuous activity that was not relevant to their performance. They also ensured to eat properly and get enough sleep.

At the Olympics, I always took the elevator to save energy. I did very little things. If I had to carry around the runners, I asked another guy to do it. It was just pure energy management. (R2)

I refrain from doing any type of high intensity training the day before my event and I just do a rapid progression the day of the competition. I go and secure all my passages but I don't waste any time on the ski hill. I do what I have to do and then I leave. The night before my race, if my schedule is to go to bed at 10:00, I go to bed at 10:00. I also make sure to eat something light so I can sleep well. (C5)

1.5.1.4.2. Preparation on the day of a competition

Some athletes described in more detail how they liked to prepare on the day of a competition. The following three citations include examples of their routine and strategies that they used to evaluate environmental conditions, and to remain calm and focused. It is interesting that one of the last things they do before the start of their event is to remind themselves to just go and have fun.

I liked to be there a little bit earlier than the others to be alone with the track and to get a feel for the weather, the wind, and the ice. After the first sled came down, I saw how the ice reacted and I adapted my driving style. But that was very complicated. I was only able to do that the last two or three years. I would just go up the track and recall my good training runs. I reduced things to the basics. That was what we always said to each other, "Tomorrow, only the basics, nothing else." Then to warm up my body, I went out in the woods in the snow far away from anyone else and only came back shortly before my race. (R2)

Mentally, it's a big event so for me, there is always a sense of excitement and I look forward to it. Playing under pressure is something that never

bothered me. Like during an overtime or shoot-out, I'm usually fairly relaxed. So nerves aren't really a factor with me. Mentally, it's just a matter of making sure I'm focused. I may do some positive self-talk or some visualization the night before or the day of a game just to feel good about myself. Basically, I just go out there and have fun. That would probably be the main mental preparation. (C6)

The coach at the starting line put me in a good frame of mind. I told him that I was nervous. I really wanted to win. I wanted to have the run of my life. He said, "Well, just have fun!" And then he started dancing to a disco tune before I left. I started to laugh and then they said, "The judges are ready." I said, "OK, let's go have fun!"

1.5.1.4.3. Expectations / pressure

Competing at the Olympics and World Championships was stressful because coaches, family, friends, sport federations, government officials, and the general public often had high expectations. The athletes consequently felt a lot of pressure to win and bring back a medal. The pressure was felt not only before but also during and after events. Two athletes described their experiences dealing with demands and pressure. One of them felt that he did not have the support he needed to get ready for the Olympic Games. As the defending Olympic champion, a lot of pressure was put on him to do well and through this, he tried to prepare the best way he could on his own.

The pressure was already too much for me before I went to the Nagano Games. Despite the good will of my sport federation to support me, they didn't really know how to proceed and I had to bulldoze my way there. It's

not like I was part of a hockey team and had a million physiotherapists with me. I tried to prepare myself the best way I could. (C5)

This athlete also felt a tremendous amount of pressure at the Olympic Games because expectations of winning were high. Furthermore, he also believed that because the national team was not adequately prepared, there was a lack of communication between the coaches and athletes and between the athletes themselves. This in turn, created more tension and stress that ultimately interfered with his performance.

There was a lack of communication among our team at the Olympics.

There were high expectations because we had been winning a lot. They were expecting three to four medals from us and I think that the coaches had underestimated how high the expectations were. They didn't prepare us well. It isn't entirely their fault because we should have told them that we did not feel prepared. I think we took things too lightly too. (C5)

Another athlete also commented on the fact that the demands and expectations placed upon him and his team to win at the Olympics were very high. He felt obligated to meet the needs and wishes of his government and country.

The emotional demands were very very high at the Olympics. The President of Switzerland and the Prime Minister were at the track to see what we were doing because Switzerland hadn't won any medals during the first week of the Olympics in Albertville. They came with a big delegation, 25 people from the government. I knew most of these people. We were one of the favorites to win. We were there to represent our flag

and they wanted to see us win. I think I forced myself to fulfill their needs.

(R2)

The following athlete revealed that outrageous demands were placed upon him after he became Olympic champion. He felt pressured to make public appearances and to participate in several community activities even though he needed time to train and to rest.

The post-Olympic syndrome was extremely difficult for me because I didn't have any support. Here in my province, when people really like someone, they have a tendency to exploit the person to the max. I was trying to keep my distance but it was too hard for me to refuse all these demands. The phone wouldn't stop ringing and it still is to this day. I wanted to give back to the people. I was telling myself, "If I do this charity banquet, they could raise a lot of funds and this would help a lot of people." I thought everyone was nice in this world but I realized that a lot of people take advantage of you. When I would tell them no, they wouldn't accept my answer and instead they insisted even more and then I would feel guilty to say no. Finally, I would attend their event regretting it from the start and didn't have fun at all. I paid the price for all these demands. These people hurt me too much so now I keep my distance. (C5)

The media was another source of stress before, during, and after high-profile events because reporters were often intrusive and did not always report the truth. The following athlete knew that answering their questions was inevitable so he basically told them what they wanted to hear in order to get rid of them.

The media judged us but I knew they judged us on the surface. They didn't see what was really going on. I thought we had done really well. I thought, "How stupid of them, they don't see the reality. They think they do but they don't perceive what it really takes to be there and what we are really trying to do with this holistic thinking and this view of quality." In any case, I always told them what they wanted to hear because then they were satisfied and I got rid of them. (R2)

The next athlete was so fed up with the pressure and demands of the media that he contemplated ending his career after he became Olympic champion. He had to watch every move he made and was not able to practice and enjoy his sport the way he used to.

After the Lillehammer Games, there were so many media demands. It just completely exhausted me. It was really hard to finish the season. I just wanted to retire, there was too much pressure. The only thing I wanted to do was to ski in peace but I felt like people were spying on me. I felt like the media was ready to report the slightest little thing that I didn't do right but no one is perfect. (C5)

1.5.1.4.4. Process of performance

The athletes did not only discuss their strategies to prepare for competition and the pressure and expectations with which they had to cope. They also talked about their performance outcomes and the actual process of performing. Three athletes noted that at the Olympics and World Championships, they focused on the process of competing rather than on the outcome of their performance. This way, they concentrated on what they could control and they relieved themselves from the pressure of winning. They knew

that by doing the best they could to prepare for the event and by giving a solid effort during the performance, they would be satisfied with the results regardless if they won or lost.

In working with a sport psychologist, I realized that the reasons I swam were more important than the outcome. Like he says, performance is a way life, performance is the way we live, not how we measure it. So I could enjoy swimming for a lot of reasons outside of winning or losing. At the Olympics in Atlanta, I knew that I had done everything in my power to prepare for my races so I basically did not put any pressure on myself to win. I only focused on what I could do, which was to control how I felt in the water. That was far more important than winning the race. So it wasn't really a matter of not caring about the outcome of the race because of course I cared, but it was a matter of not being afraid of the outcome and not making up in my head dire consequences of losing the race. (R3)

I was focused on the track. I didn't see anything else but the track in front of me. I was very sure that it was a good run. The feeling was there, the speed was good and there were nearly no mistakes. That made me really happy, not just because of the victory but because of the process of resisting all the demands around me and learning in these very complicated and stressful situations. Only learning takes you out of these situations. (R2)

Now I am just really casual about it and I take the pressure off by not worrying about the results. I promise myself before I go into any

tournament that I am going to be satisfied with the results, even if it is last place. That is alright with me as long as I try hard. I can control my effort on the mat but I can't necessarily control if my opponents are going to throw me because they may catch me on something, and that happens. I know that if I wrestle tough and put in a good effort, I will do ok. That's all that matters. (C2)

The next citation illustrates the process the aforementioned athlete went through during a particular match at a World Championship. By focusing on her actions and remaining indifferent to the score throughout her match, she did not succumb to any pressure and ended up winning the psychological battle she fought against her competitor.

I remember walking out onto the mat and I was trying to look serious because you want to look tough before you go at it. But then I heard the Canadian section cheering me on and all of a sudden, I broke out with this big smile, which is weird because you normally don't do that before a big tough match. But I had this big smile and I got on the mat and really went after her. I was really aggressive and ended up really dominating her in the match. There was a point where she was trying to throw me so I threw her and the referees gave her points when really they shouldn't have because it was my move. So there was some controversy and the coaches were yelling and they were talking it over but I remember not even worrying. I was just thinking, "If I don't get the points, it is no big deal. I am not worried about the score. The next point is mine." I did a good

thing just then and I accepted that. It was just awesome and I ended up winning the match 4 to 3. It was close but I felt like I was in control and it was just a good experience for me. So I think this girl may be better technically but I beat her psychologically for sure so that was exciting.

(R2)

The next citation also describes the process through which an athlete went when he performed at the Olympics. According to him, it was important to be in the moment, to be connected with his environment, that is, the track and his sled, and to invest all of his energy into the race. He knew that he gave a solid effort when he was exhausted at the finish line.

When I took the first step with my sled, it was like an explosion, like an eruption in my body. I had invested so many years in that. I wanted to benefit from this moment and give everything I had. When I finished, I was just exhausted. It was just one minute but all my energy was gone. I invested all my energy into having a good start, being aware of every little moment, trying to be intuitive and feeling the track. At the end, all my energy was gone. (R2)

The following athlete discussed the connection he had with the crowd at a World Championship. His fans were enthusiastic and encouraged him and he used the energy they were generating to give one of the best performances in his life.

This World Championship was unique because there was a synergy between the crowd and me. It was a lot of fun. I put on a good show for them and they were happy. They encouraged me and I felt it. I don't know

about the other athletes, but I'm really sensitive to these things. When my environment is good, I do well, everything is automatic. When my environment isn't good and I don't feel at ease, I have difficulty, I can't perform. (C5)

Being engaged in the process of performance appeared to be important to several athletes, as was performing with consistency. According to the following two athletes, being able to reproduce a high quality performance over and over again at the Olympics or World Championships was their ultimate challenge and a significant indicator of success. It is interesting that the first athlete did not think he was more skilled than his competitors in his sport. What made him better was his ability to consistently perform during competition.

I was not better. I think I was just able to do it when it counted. Even if you can reproduce ten really good runs in training, it's very difficult to reproduce four at the Olympics but I was able to do it. (R2)

I knew I was one of the best when the results started coming in a couple of years ago and when I became more consistent. It's all about consistency because people can have a great race or a great event out of the blue but when you start doing it consistently, that's when you really see the success and ability. (C1)

The athletes were also asked to talk about some of their best and most rewarding performances during their career. Five athletes described performances that occurred during the maintenance years. The feelings associated with these peak experiences were said to be powerful and magical. Three athletes reported that their actions were effortless

and automatic. They were extremely confident and felt like no one could stop them. The next citation shows how one athlete used the energy of the crowd to fuel her performance, especially when she got tired during a game.

This year we played a game in Vancouver and that was one of my better games of the season. Physically, I felt really good. My legs felt good, they didn't feel heavy. Everything was clear in my mind. I was just reacting to the play and moving the puck quickly and seeing things before they happened. I had a sense that I was better than everybody else, a sense of dominance and a sense of being "king of the castle." I felt powerful, alert, awake, and kind of fresh with lots of jumps. I felt really good and excited because we were playing in front of 15,000 people who were basically cheering for us and that was a huge lift. When my legs couldn't go anymore, it was a lift knowing that everybody was there to support us. Things just fell into place. I took a shot and it went into the net and it started to build my confidence. The earlier this happens in a game, the better your chances are to have a good game. I think preparation had a lot to do with it, just from the way I had prepared for that game and players were just clicking on the ice. (C4)

I left the blocks and it was magical. I was in a trance. My knees were moving at an incredible speed and the satisfaction was extraordinary. I got to the bottom and I knew that the two guys after me would have one hell of a run to beat. I was so ecstatic! My reaction wasn't to lift up my arms in the air and say, "I did it!" It was to go back to the top and do

another run right away to try to relive this feeling that lasted 23 seconds. I wanted to do it again because I got such a rush out of it. (C5)

There is a way that you come together as a team that will just take you over the top every time. If you don't get there and the other team does, you could have more talent and you're still going to lose. On the other hand, the other team could have more talent but if you get there, you're going to win. There is an intangible and you can't say that it's one thing or another but it's there. You can feel it when it's there. You can even see it in other teams when it's there. I remember the National Championships. We could see it in a team and it was just the scariest thing because we knew that they had the same intangible. I don't know what it is. It's this thing that gets you going and it's just so hard to stop if you have it. It can arrive out of the blue but you can also work to get it. I've seen all sides. (R4)

The next athlete said that although things happened more naturally when she had a peak performance, she was very aware of her surroundings. This is somewhat different than the experience of C5 who perceived himself as being more in a trance. It is noteworthy that she has not been able to depict what generates a peak performance, although experience could be a contributing factor.

When I'm in my best race, I'm really aware of everything around me. The 500 is pretty short so I don't necessarily know that I'm having a great race. I just know that I'm having a good one. Everything just happens naturally and I'm aware of my surroundings. I see people along the mats. Often I have certain people at certain places and I'll just be aware that

they're there. When I think back on a race and I can't remember much of it, I know it was a good time. Again that's experience. The more I do it, the more naturally it becomes. (C1)

The following athlete revealed that one of his best performances occurred at the Olympics when he was relaxed and consciously aware of his running technique. He also benefited from the energy and enthusiasm of the crowd.

I feel that one of my best performances was at the Olympics. I remember running very relaxed for the first 200 meters and expecting myself not to be in the lead because I didn't really want to take the lead. I really could not tell what place I was in but I was listening to the announcer and he said I was in the lead. I had even more of a burst of speed coming home. I really concentrated on the technical aspects of the race so it wasn't something that just came natural. There have been some races where it felt like that but it wasn't at the Olympics. The noise level was greater than usual and there was more emotion in the crowd and that is what made it feel a lot different. So that was definitely my best performance. (C3)

1.5.1.4.5. Setbacks

Although the athletes had exhilarating performances and lived positive moments during the maintenance years, they also experienced setbacks. The next five citations illustrate some of the difficulties that the athletes faced at the Olympics. Some of them had to overcome serious challenges and struggles. For example, the following athlete had problems communicating with his coaches and teammates. There was a lot of jealousy

among team members and this created tension that eventually affected everyone's performance.

I was living outside the athletes' village and my teammates thought that I was getting special treatment. When the coaches spent some time with me, the others thought that I was getting special treatment as well because I was the defending champion. I wasn't asking for any favors. There was a lack of communication and a lot of ambiguity. I felt like I couldn't talk to my coaches because my teammates didn't like it. This created a lot of tension and it just got progressively worse. The coaches did not address any of the problems we had and they quickly realized that it was too late to mend the broken pots. It simply didn't work out over there. (C5)

As a result of this lack of support and cohesion, the aforementioned athlete was really stressed out and felt betrayed by his coaches and teammates. He contemplated not performing in the final race and sought the advice of his parents who were at home half way across the world.

The night before the race, I called my parents crying. I told them, "I don't have any solutions anymore." Usually when I call them and things aren't going well, I tell them, "I will try this, I will try that and it will surely work." But this time, I called them and woke them up in the middle of the night and said, "The race is tomorrow and I don't know what to do. I don't know if I should even race, I don't know if I even feel like it." My dad said, "You have nothing to lose anymore. Just put everything that happened aside, have fun, and do the best that you can. You won't regret

having done the best that you can." So I just said, "Ok, that's what I'll do." But based on my experience at the Lillehammer Olympics, I knew that regardless of what happened, I wouldn't win. I knew that I didn't have a chance or only a slim one. (C5)

Another athlete reported that his team did not perform up to personal expectations. He was very dissatisfied and as the leader of the team, he organized a meeting in which they discussed strategies to refocus and improve their performance the next day.

The coach, personal mechanic, brakeman, and myself went out to have a beer after our first run. We had a little meeting because I was really upset. I told them, "Forget about what happened. We all have to do our job just like we always do when we have World Cups. We don't talk to anyone else. We do our job." I told the mechanic to take care of the sled and told my coach to control the environment and keep the media and officials away. I said, "Just keep them away from us and let's forget about the past. There's only one day left in our life. We do our job tomorrow." (R2)

Two hockey players also discussed the fact that they did not play up to their potential at the Olympic Games. A lack of complete confidence and an inability to capture and play with feeling were reasons given for the team's substandard performance.

We were there in that final game at the Olympics but that feeling wasn't there and it should have been. The coaches gave us everything we needed. It was up to us as players to get out on the ice and do it. It's not that we played horribly the first and second period, but we didn't have that

feeling, whatever it is. It just wasn't there, which is strange. Maybe it was there for some and it wasn't there for others but we didn't have the whole thing. It's funny because I look back and I think we had it for a couple of days. If we would have played on those two days, we would have killed anybody in sight. But when it came down to the final day, we had it in the third period but that was it, which is sad to say. We struggled with that feeling all year. We had it some games and others we didn't but we did work at it. (R4)

I think that our team didn't come as far as we could have and I don't think we ever peaked or played to our potential for various reasons.

Centralization was new, people were away from home, and the confidence level was up and down all year. I don't think anyone ever had peak confidence in themselves. But for the most part, we did most things right going into the Olympics. (C4)

1.5.1.4.6. Post-competition evaluation

The athletes engaged in several preparatory activities before and during competitions. They also spent considerable time evaluating their performance after events. Examining the factors that led to their performance was an important step in drawing lessons to continue improving in the future. The next athlete suggested that analyzing wins was far more important than analyzing losses.

You have to analyze your wins after a season. Why? To know exactly why you won. I saw a lot of people who just partied after they won at the Olympics. They didn't even think about why they won. I also saw a lot of

teams who lost and evaluated all their competitions. But that's just stupid.

We learned from our losses but we didn't spend too much time analyzing them because we would have just been analyzing the bad things. (R2)

I made mistakes but I always learned from them. I kept improving by realizing when I made mistakes and I tried to do things differently the next time. (C5)

The aforementioned athlete said that he was often asked by the media to evaluate his performance immediately after he finished a race. He found that very difficult to do because he did not have sufficient time to integrate the results and really consider all of the factors involved. After his final race at the Olympic Games, he gave reporters an interesting response.

There is such a big competition between reporters at the Olympics because they all want to be the first one to get your commentary after a race. They want to get your feedback but it's hard to analyze a race right after you just finished. It's almost impossible. You have to take a step back and really look at what happened. So after my final race at the Nagano Olympics, I told them something that I really don't regret. I said, "Listen, I came in 4th place. I am disappointed because I would have liked to do better. I know deep down that I had the talent to do better but I wasn't able to do it today. I am disappointed but you know, in two days, I will be over this." It wasn't true because it takes much longer than that, but I said, "I could cry but I am in good health and this is the nicest gift anyone can have. There are more important things in life. There are sick children

who have cancer and that is more important than me finishing 4th." They were all, "Uhhhhhhh." So I just said goodbye and left. (C5)

Another athlete assessed her first Olympic experience and said that she wished she would have expressed her opinion more frequently.

After something like this, you can always get better. Personally, I would want to speak up a bit more about how I was feeling or give my opinion to the coaching staff or to the team because it was the first time for everybody, so it was a learning experience. So I would have maybe been a little more active in that regard. (C4)

1.5.1.4.7. Post-competition euphoria

The athletes also celebrated their successful performances after a competition. According to the next athlete, becoming an Olympic champion was an extremely positive moment in his life that generated a lot of energy for some time after the event. It gave him the will and desire to continue improving in his sport. Once again, it was evident that the learning process was as important as the results, if not more.

My victory at the Olympics was such a unique experience. It gave me a wave of energy that carried me for six months. I was always hyper. It was so amazing that I said, "I am going to try this again." I didn't feel like stopping after Lillehammer, I wanted to keep going. I knew that I would learn so much from this journey. It was more than just the results. (C5)

I think everybody enjoyed the Olympic experience despite the outcome. It was everything I imagined. It was really a lot of fun. (C4)

1.5.1.4.8. Recovery

Recovery during the maintenance years was another significant theme discussed by most athletes. Due to the intensity of their preparation, performances during competitions, and external demands imposed by various organizations and the media, they included rest periods in their schedule to allow themselves to mentally and physically recuperate. Engaging in activities outside of their sport, taking naps, motivating themselves through self-talk, and setting new goals were some of the strategies they used to rejuvenate and stay refreshed.

Sometimes I got a little mentally drained from being on the ice every day. I needed to get away from the team so I would hang out with my friends or do something away from the rink and that allowed me to come back and feel refreshed. I basically rested and waited for the team to get back together. (C4)

There were some days when I was tired, but it was just a matter of fighting through it and staying on the move. I kept talking to myself positively, "I know I'll feel better tomorrow. I just have to get through this hour." Some days I found that my body needed a rest so there were physical signs that got me mentally saying, "Ok, I need a rest." (C6)

Sometimes you have to take a break and recycle yourself because when you have done everything you had to do in a sport, you can get bored and decide to end everything there. You can become a vegetable. So it's important after the end of an event to wait a bit and then ask yourself,

"What do I want to do now? Ok, this is my other dream. Let's go." And you move into a new direction. (C5)

I made sure when I moved here that I got an apartment by myself. A lot of players lived together but I said, "No way." Maybe it's because I was older. Every night, I knew I was coming home and I could do my own thing. I played guitar too, so I sort of got into my own zone with that. I needed space so that was part of my mental recovery. I had other little tricks to give myself mental space. If I was on a bus with 28 other people, I could still have mental space by putting on my walk-man because everything else was gone and I was just with my own thoughts. As far as physical recovery, sometimes I was just really tired and when I had a day off or two, I made sure I rested because I knew that I wouldn't have made it through training if I didn't. I didn't go anywhere and this was the hardest part because sometimes I wanted to do other things. I also napped anytime I could. My teammate was always bugging me because she couldn't sleep on the bus or the plane but I could sleep anywhere. And that was a really good thing. Anytime I could nap, especially on the road, I'd be gone. (R4)

In sum, competition during the maintenance years demanded intense mental and physical preparation, as well as adequate recovery periods. The athletes experienced both peak experiences and setbacks that fuelled their passion to learn and to get more connected with the process of performance. Self-talk and visualization were among several strategies they used to regulate their level of intensity and deal with excessive

pressure and demands associated with high-level competition. The parents' and coaches' perceptions of topics related to the maintenance years will be presented next.

1.5.2. Parents / Coaches

The parents and coaches shared their perceptions regarding the context within which the athletes maintained their performance once they became World and Olympic champions. They also provided extensive information on their personal characteristics and issues related to training and competition. The next section will focus on the context of the athletes during the maintenance years.

1.5.2.1. Context

Several contextual factors that were pertinent to the athletes' performance at this level were discussed by the parents and coaches. These pertained to parental support, coaches, teammates, support staff, and financial sacrifices. Parental support will be discussed first.

1.5.2.1.1. Parental support

The parents reiterated the fact that they were supportive throughout their children's career, including the maintenance years. They seemed to provide moral support more than anything else at this level, although one father said that he still helped his daughter to analyze her games.

I've been supportive all the way through. She lost her mother five years ago so I think that the memory of her mother also drives her. (PC6)

At this level now, it's giving her moral support more than anything else because she has other coaches and she has on-ice support. We still talk. She'll come over and we'll put games on t.v. and I'll say, "So and so is

pinching it, what do you think about that?" She still asks my opinion on what she's doing wrong when she misses breakaways or whatever and I just try to give her suggestions or things to do. It's more a supportive role now. (PC4)

The next coach observed that R1's parents and sister were always very supportive of everything she did.

Her parents were always really supportive but at the same time they were not really pushy. They always accepted her for what she did. She lived with her sister most of the time she lived in Calgary. Her sister was also really supportive. (CRI)

It is interesting that in addition to always being there for his son, one father spent considerable time organizing his affairs after he became Olympic champion. He took care of the mail and telephone calls he received and helped his son plan a tour to go speak at all the schools in his area.

I was so busy taking care of all of his things. There were boxes of mail from all the schools and I sent something back to all of them. Fortunately I was retired, otherwise, I wouldn't have been able to respond that way. I organized a tour of all the schools and scheduled him to talk at three or four schools per day. I told them no autographs! Everyone was happy after that. (PC5a)

1.5.2.1.2. Coaches

In terms of coaches, one mother confirmed the fact that her daughter had access to excellent coaching when she trained at the National Sport Centre.

In the fall of '96, she moved to Calgary to train at the Olympic oval with the national team coach. That's where the best coaching was. (PR4)

One coach who only coached C1 during the maintenance years said that she was independent and mature enough to make her own decisions at this level. Although he had some authority, he had a very interactive style of coaching that allowed her to have a lot of input and to ultimately control the path she wanted to follow.

I try to drive her along a certain path because she's definitely old, independent and strong enough to know where she wants to go and what she wants to do. The way that we work is definitely very interactive. I'm there to answer questions all the time and to give my guidance every day. I'll certainly have some authority but it's ultimately up to her to decide what she wants to do. (CC1)

1.5.2.1.3. Teammates

Two coaches discussed the fact that the athletes were very supportive of their teammates and vice versa. Note that C1 was an individual sport athlete whereas R1 participated in both individual and team events. Being a team player appeared to be important to their overall development.

Basically our whole team improved and became more achievement-oriented, and she was one of the catalyst for that improvement. Everybody brought each other up to the top and because she was confident, she wasn't afraid that her teammates were going to beat her because all of a sudden she believed that she could be good too. (CC1)

If I look at her and her duet partner, they were very very good at congratulating each other and getting excited when they finally got a part of the duet exactly right. Even if they only got three seconds exactly right, they would get really excited and kind of pat each other on the back and say, "Wow, look at that, three seconds, it's perfect!" It didn't matter that the other three minutes and 57 seconds weren't perfect yet. They were able to take it one step at a time. (CR1)

1.5.2.1.4. Support staff

In the next three citations, the coaches discussed how they worked with support staff such as sport psychologists, nutritionists, strength coaches, and exercise physiologists to maximize the athletes' preparation and performances at the Olympics or World Championships.

The sport psychologist goes with us to the Olympics. He was working with us pretty much throughout the year. We didn't do too much on what you would call traditional mental training. What we did instead was a lot of team building stuff. We talked a lot about different emotional challenges that we might have to face at the Olympics. I think that was good for our group because individually, they were probably doing some of the mental training stuff on their own. (CC1)

She works with a high performance strength coach at the National Sport Centre. She also had exposure to a nutritionist and sport psychologist and things like that so she's really had the high end of things in the last couple of years. (CC2)

We worked with an exercise physiologist so that we could track their training much better. By the time we got to the Olympics, we knew how to adjust our volume and intensity, when to rest and what we wanted their blood profile to look like so that they wouldn't be overtrained. (CR1)

1.5.2.1.5. Financial sacrifices

Two parents mentioned the fact that their daughters were not financially rewarded for training and competing at a high level on a full-time basis. In both cases, they postponed their working career to be able to be part of the national team program. The parents corroborated their daughters' reports that they were intrinsically motivated to participate and succeed in their sport.

Her dedication has impressed me. It's hard work training the way she's trained and leaving home for the length of time she did. She was teaching and she had to get a leave of absence to go out there for two years. Also, when she attended some of the national training camps through the years, she didn't get paid. Of course, she didn't get paid when she took a leave of absence in '97 and '98, but I guess in her mind, hockey was all that was important to her. I'm sure if they said, "You cannot have this leave of absence," she would have gone anyway and said good-bye to her job. That's the way she is. (PR4)

Financially, they are not rewarded but at least they get treated well. It's a privilege to be part of the Olympic program, they'll tell you that. But I think she is rewarded by the fact that she is a role model for young kids. That in particular is very satisfying. (PC6)

In sum, the context within which the athletes maintained their performance was nurtured by supportive parents and collaborative coaches. The coaches mentioned that teammates and support staff played a significant role. According to a few parents, the athletes made considerable sacrifices to remain involved in their sport and maintain their performance but they were not financially rewarded for it.

1.5.2.2. Personal Characteristics

The athletes possessed many strengths and qualities that enabled them to not only become World and Olympic champions but to repeat their performances once they achieved the pinnacle of their sport. When the parents and coaches were asked what set the athletes apart from their competitors, they indicated that it was their good personality and sportsmanship, motivation, self-discipline, dedication, drive, determination, analytical skills, creativity, positive attitude, love for their sport, confidence, practice habits, and willingness to take risks. The following citations exemplify their perceptions.

It's his personality. He is genuinely a good person. I'm not saying that the other guys aren't, but for the most part, he is very easy-going, laid back, considerate, and kind. He is a good guy and I think that that transferred over to his training somewhat. (PR3)

I believe it was her own motivation and self-discipline. She is a really considerate, conscientious, dedicated person. No matter what she does, she wants to do her best. I don't mean that she wants to be better than this person and that person but she wants to do the best that she can do. (PR1)

It's his perseverance and ability to analyze his performance after a competition. He can identify what didn't work and he knows what he

needs to improve. He'll get to the bottom of the hill and say, "It was a good run but I hesitated a bit on the first jump." No one sees this but he knows. He is a good analyst because he watched so many videos. He's also very innovative. He invented new jumps and there is one named after him because he was the first one to do it. (PC5a)

It is basically her practice, dedication, and love for hockey. She has organized her life to go to school and play hockey and has done an excellent job at both. She set a goal on her own to try and go as far as she could and didn't publicize it and now we have to give her credit for achieving what she has done. (PC6)

He is a competitor but he is also a very good sportsman. Nobody likes to lose, but win or lose, he will go over to his other competitors, congratulate them, and tell them it was a nice race. I think that's one quality that sets him aside from the others. He never complains and when he does interviews, he's never negative. Unfortunately, the media tries to get him to say something negative about his competitors but he would never do that. He just has an excellent attitude. (PC3)

I think it's her drive. She's a good hockey player. She's smart and understands the game. She has all the tools but then what brings all of that together is her determination to be the best. That's what separates her from the rest because I have seen some good athletes who are very good technically. They can do anything but when it comes time to really make an impact in a big game, they don't. She just steps right up there, accepts

the challenge, and just does well. I think that's part of her drive and competitiveness. (PC4)

She's not afraid to go out and do the work and to take risks in the middle of a wrestling match. I think that's one thing that really sets her apart. A lot of people go into a big situation and they think, "I have to play it safe and not make any mistakes," and that's not her. She goes out and stirs it up and goes after things and ultimately that's what I think most World champions do. Also, she doesn't set limits and that comes from her family. She kind of has this "no lose" attitude. She's not worried about losing. She's just worried about going after things and being tough and that is why she's successful. (CC2)

If I had to come up with one overall reason why she achieved success, I would say that it was her belief. That seems to be a common denominator that I keep running across in the success of athletes. They don't really achieve the ultimate until they can really finally believe it. But how you develop that belief is a combination of doing the right things physically and doing the right things mentally. (CR1)

I think the big difference is that she's become a really confident person in skating this year. And the confidence she's had has enabled her to train a bit more and work on her technique more because she thinks she can do better. It has helped her to be a bit more prepared when she races and a bit more sure that she'll do well. (CC1)

In addition to the aforementioned qualities, two parents highlighted the fact that their children were very down to earth and humble. They never let the fact that they were the best in the world go to their head.

She has won quite a few medals but she hasn't let it go to her head. She usually says, "Oh no big deal." If the newspaper phones her or the radio station wants to talk to her, she's in no hurry to phone them back. She's not one to brag about herself. Her parents and everybody else like to brag about her more than she does! (PC2)

He never bragged about it. He would smile after a race. Some kids go crazy after they win something. They run and jump around. He would just walk off the track as if there was nothing. It was like, "Ok, I won another race, that's all." He's even that way today. When he won the Olympics, it was, "Ok, I won the Olympics, what's next?" (PC3)

In sum, various strengths and qualities were perceived to have contributed to the athletes' overall success. The ones most cited by parents and coaches included determination and confidence.

1.5.2.3. Training

Training was extremely important during the maintenance years, just like in the investment years. The parents and coaches shared their views concerning the different components of training in which the athletes engaged and the orientation of their training environment.

1.5.2.3.1. Physical training

In the following two citations, a parent and coach shared how it was important for the athletes to follow a strength and cardio-vascular training program to maintain their performance. They confirmed the athletes' observations that a complete training program that targeted all areas of their performance was essential to remain at the top.

He is currently following a personalized training program to try to maintain his performance. He told me once, "I am not losing anything by following this technique." He is staying in shape and he goes biking all summer to improve. (PC5a)

The amount of time that she puts into the sport now compared to when she first started is very different. She's now a year round athlete so she trains throughout the year. Her first year, she wrestled a lot but I don't think she did as much of the other stuff on top of the wrestling, like the cardio-vascular and strength training. Now she does the whole package. She developed a full repertoire of technical skills and she has learned how to set things up a lot better tactically when an attack is appropriate and when it isn't, and that has made her a lot more dangerous as a wrestler. She's had to do this because in the past seven years, the level of competition has increased significantly so she has developed along with the sport and has done what she had to do to stay at the top. (CC2)

1.5.2.3.2. Orientation

The environment in which the athletes trained was geared toward the development and performance of high level skills. The following citations by coaches

confirmed that training was intense and involved extensive hours, and that quality was of the utmost importance.

For sure the most important thing in skating is the technical aspect of it and that is developed through on-ice training. We did a lot of technical workouts combined with a lot of very highly intense quality workouts.
(CC1)

She trained a lot. It was probably 30 to 34 hours a week with the weight training, the land drills and everything else. But quality was also important. I always demanded high quality performances in the water and she was always up to that. Whatever I told her to do she did it to the best of her ability. (CR1)

Both the mother and coach of C2 raised the fact that she had to reduce her teaching workload to accommodate her vigorous and lengthy training schedule.

She only teaches half-time. Last year, she taught full-time and she just found it too hectic for her schedule because she was always either training or coaching or taking kids on tournaments or going herself on a tournament. (PC2)

She does physical training to supplement her wrestling training and that's ultimately why she's teaching half time right now. Teaching full-time was too hard because she was training at least three hours a day for five days a week. She usually trains in the morning or just around lunch time for an hour or two and then she's on the mat two hours at night from five to seven o'clock. She also often has tournaments on weekends so it's a lot of

her time but that kind of commitment is what has helped her continue to improve. (CC2)

According to the following father and coach, the athletes invested several hours into training to be at their peak during the maintenance years, but it was not necessarily more hours than during the investment years.

She gets better by practicing, being on the ice and taking shots. She gets ice time out there that she wouldn't back here that's for sure. I don't think it's more hours of training though at this level. Her level of conditioning is pretty much at a peak. I think for a goalie, it's not the strength or the cardiovascular aspects that are more important, it's more the agility. But she needs to be physically fit at the same time. I don't think she'd be any more fit if the program was stepped up. (PC6)

You're always trying to achieve more but I don't think you always have to increase the volume or the intensity of training that you do year by year. It doesn't really work that way. What happens is that there is a cumulative effect of training over the years so they seem to do better than the years before just because they have trained for so many years. (CC1)

The activities in which the athletes engaged were aimed at improving their performance. One mother provided an example of a training session she observed in which her daughter worked on refining a specific aspect of her performance. Both her self-discipline and the motivation from her coach appeared to be instrumental.

That's where I think she and her coach were both very much on the same planes. Her coach would say, "You can do better than that," whereas a lot

of other coaches would say, "That's pretty good! That's fine." It was never fine for my daughter. She always wanted to be a bit better, even if it was just moving a finger on her hand. I was amazed watching them one time. They didn't feel that the arm was quite at the right angle and the fingers weren't exactly the same, maybe one girl had her chin up a little higher than the other. Talk about precision and discipline. I could not believe it. Any sport at that level is not about being good, it's about being as perfect as you're capable of being. (PR1)

The next coach reported that setting challenges to improve performance on a daily basis was extremely important. Focusing on the process of training, incorporating interesting activities, and finding reasons to celebrate the smallest improvements motivated R1 to persevere through her sometimes monotonous routine.

We thought of a challenge each day and that made it much easier to continue. Every day, we looked at the things we could celebrate. It wasn't just winning the gold medal at the Olympics. It was, "Ok, what are we going to do today that is going to make us feel great?" So there was a lot of celebration on a daily basis. At times, the day-to-day routine could get really tedious and boring, and tough to take day in and day out, month after month so we tried to make the training interesting and productive. (CR1)

1.5.2.3.3. Changes

Some changes were made in the athletes' training during the maintenance years in an attempt to maintain their performance. One coach revealed that R1 had to be

innovative and practice different movements and skills in training to keep an edge over her competitors. An exercise physiologist and figure skating choreographer assisted her in developing different strategies to continue improving and avoid getting complacent.

We were always looking for better ways to train. The training wasn't the same. We worked more with the exercise physiologist to push her harder and to help her recover better so that she didn't get complacent. We spent a lot of time trying to improve her solo choreography and doing things that nobody else could do. We worked with a figure skating choreographer to get different movement patterns and to look at things from a different perspective, not to get stuck in this little box. One of the biggest things that helped her in '88 was that starting in '86, we worked on her being able to perform a very very long figure at the beginning of her routine and then to maintain the intensity all the way to the end. It took two years for her to develop that and to be able to physically do that. (CRI)

In the following citation, one father discussed the setback his son faced when he changed his training regime. He chose to lift weights when he was advised by his coach not to do so. He agreed with his son that it was a mistake but that he was back on the right track.

One thing about him is that he just wouldn't listen. He had to do it his way until he found out that his coach was right and he was wrong. It happened to him in 1997. He should have known better. The coach he had at the professional level told him, "You do not lift weights during the season." He had lost too much weight so he decided to lift weights and he messed

up in the World Championships because of that. Then he went to the coach and admitted that he had gone behind his back and lifted weights. Now, we think he's back on the right track again. (~PC3)

In sum, training during the maintenance years involved various activities that were performed with high intensity and quality. The parents and coaches confirmed that the athletes invested many hours but that it was not necessarily more than what they did during the investment years. Being innovative helped one athlete to maintain her performance but in another case, it was not particularly helpful.

1.5.2.4. Competition

Competition during the maintenance years entailed preparing for and attending high profile events like the Olympics and World Championships. This section presents the perceptions of coaches and parents regarding strategies that the athletes used to get ready for competitions, to focus on the process of performance, cope with setbacks, demands, and pressure, and to maintain some balance in their lives.

1.5.2.4.1. Pre-event preparation

The parents and coaches confirmed that the athletes adopted a certain mindset prior to high level competitions that helped them to stay positive and confident, and cope with the pressure associated with these events.

I remember her saying to me, "I've had so much success. No matter what happens now, this is all extra." Her attitude was, "The successes I've had, nobody can take them away from me so I'm not going to put any pressure to feel like I have to repeat as a champion or I have to do this or do that." She feels very lucky to have had the opportunities she's had to go to World

Championships and represent her country. So I think that's helped her to stay on top. As soon as you start looking down and think, "There are all these tough people coming up or they're shooting for me now because I'm World champion," it either scares you or coaxes you. I really don't think she is afraid to be challenged by people just because she has that attitude. She has a really strong inherent belief that she can accept challenges.

(CC2)

He seems to be very very good mentally. We had breakfasts and dinners with him during the Olympics. This was the biggest event in the whole world but his attitude was, "I know I have run against everybody on that track before and I have beaten them. My chances are as good as everybody else's. All I can do is the best I can do and hope that everything works out all right." (PC3)

She was pretty nervous before the race and tight during the race. Her strides were very short and truncated but she still followed the same race plan, had the same focus, and talked about the same things. Even though she was nervous, she did well in the race because we really tried to see it as any other race. But it's almost impossible to have people really believe that it's just like any other race. (CC1)

The athletes' preparation for competitions involved not only developing an effective mindset, but also engaging in self-talk and visualization to maximize their mental readiness. According to several parents and coaches, these strategies also helped them to maintain their confidence and focus for their event.

I know before the competition, she'd go in a corner and just talk to herself and motivate herself, like a coach sometimes would do to an athlete. She'd sit in the corner for 15 to 20 minutes and just prepare her mind for the match and get focused. I think a lot of athletes don't have that ability to focus on what they are doing and to just close everything else that's going on around them. I think it has helped her because she's been at the top a lot. It's harder for her in one way because the others are always trying to catch up. (PC2)

The weeks immediately before a World Championship, she really goes into a mode where she convinces herself that she can do it. She wants to hear a lot of positive feedback. She doesn't want to hear a lot of negatives. She also develops positive affirmations that she'll repeat to herself over and over before the competition and maybe half an hour or fifteen minutes before her match as she's warming up. (CC2)

As a result of working with her constantly throughout the year, reminding her of the same technical aspects, "Low and long, long and powerful," and basically repeating the same four or five cue words all the time during every practice and before every race, she started to get a lot of confidence going into a race. She'd come up to me and say, "Ok, do the same thing, long and powerful," and I would go, "Yeah." So it became almost a routine for her and it was pretty helpful. I think that worked well through everything that we've done this year up until the Olympics. (CC1)

We used visualization skills to prepare for competitions. She was a natural visualizer so she just naturally visualized how she wanted to be. (CR1)

I think that my daughter's focus is on herself and her own abilities. It's a team sport but when you're playing goal, you have to stop the puck so that's really what she does. To prepare for games, she goes through an imaging process so that when she's in a high performance situation, she has the ability to do that. (PC6)

One coach also mentioned that C2 isolated herself between matches in order to prepare herself and keep her focus on her performance.

She detaches herself from others at a World Championship and that has helped her to be successful. If she has a big match coming up, she doesn't go out and watch her teammates. She'll go out to the back and do her own preparation. She doesn't want to know exactly how everyone else's matches went. She just focuses on her own stuff. If there's something that she had difficulty with during a match, she may ask the coaches for some feedback and then she tries to utilize that when she moves on to the next one. (CC2)

Another coach reported that it was important for them to visit the competition site ahead of time in order to get acquainted with the environment and allow the athletes to visualize all the aspects of the competition venue. This in turn allowed them to be relaxed and confident about the upcoming event.

I think one of the key things that we did in preparation for the Olympics was we went to the competition site ahead of time. We just went there to

do some demonstrations, meet the people, do some t.v. work with them, and see the venues so that the swimmers were then able to visualize actually being there. We got out on the pool deck even though the pool wasn't finished yet, and I had them stand where they would start their routine and visualize it. They had the chance to see the competition site in a less stressful way so that when we got back home and they visualized being there, they were cool, relaxed, and they appreciated the site. (CR1)

Preparing for high profile events like the Olympics also involved staying away from the media. A coach and parent discussed how the participants isolated themselves prior to and during their event in order to stay focused on their performance.

He stays to himself a lot because when he's leading up to a major event like that, he gets a lot of telephone calls. He had to have his telephone calls monitored because the news, media, and radio all wanted a piece of him. He couldn't concentrate and train like that so he cut himself off to all of that until a couple of days before the event and then he talked to the media. Even during the Olympics, he didn't stay at home. He stayed in a regular hotel where no one knew where he was so that he could concentrate on his event. (PC3)

We closed down the media before the Olympics. We had one press reception and then a water show just before we left. We told them that we were going to do that starting July 1st so if they wanted to get something in, they had to do it before then because that always took away from our focus and concentration. We controlled the people who actually came to

watch the athletes and surrounded them with people who were positive.

We actually left the village half way through the Olympics and trained outside so that we could have more private training. (CR1)

The following coach revealed that watching videotapes of opponents helped C2 to prepare for her matches. Watching her own performances was also a useful strategy for her to get ready and improve skills.

When we go to World Championships, we watch tapes of her opponents to dissect their performance. That's one area that has helped us be successful as well. We also use video for our own people to help them improve and get prepared for a competition. (CC2)

1.5.2.4.2. Process of performance

Focusing on the process rather than the outcome of competitions was perceived to be important by not only the athletes but also their coaches. In the following citations, two coaches discussed how they helped their athletes concentrate on their performance at the Olympics and World Championships. One useful strategy included breaking down the athlete's match into manageable segments while another was to have fun and enjoy every moment of the event.

I talked to her about breaking her matches down. To wrestle someone in a World Championship final can be a really stressful thing. It's a really hard fought battle so I try to convince her that she doesn't have to wrestle the person for a whole match. I tell her, "Go out there and set your goal to wrestle for 30 seconds. Wrestle as hard as you can with a good wrestling stance. Set up your best take down and all you have to worry about is 30

seconds of wrestling.” That’s a real small piece of the puzzle but if she can break it down into little pieces, it seems so much more manageable and attainable because she can wrestle anybody for 30 seconds. She has done that thousands of times. She can stay focused and aggressive 30 seconds at a time and that way she ends up being much more successful.
(CC2)

The goal was definitely to win. There was never any question about that and if people asked us what our goal was, we always said, “To win.” It was never this business, “Oh, to do the best that I can do.” But we talked a lot about how we wanted to enjoy the process. The process, ultimately in the end, was more important than the product. First of all, we talked about enjoying the training, which we did, as much as you can enjoy that. Then, we talked about going to the Olympics and enjoying being there, and actually coming out of it remembering something about it. In ’84, I was so stressed. I didn’t remember anything about the Olympics. It was the same for her. She was kind of a space cadet. So in ’88, we wanted to be much more aware of what was going on and pay more attention to the process and the enjoyment of where we were and that whole experience. (CR1)

In the following citation, one coach shared the positive outcome of a performance that was also discussed by the athlete in question. This match appeared to be the most important and memorable one for both of them.

I remember she was stepping up onto the mat for her semi-final against one of the most successful wrestlers in the world and she had a huge smile

on her face just because she had convinced herself that this was going to be awesome. It was exciting for her to be wrestling at a World Championship against one of the best wrestlers. She repeated her affirmations to keep herself focused and positive. She was just pumped and she went out and wrestled a fantastic match and ended up beating the girl and going on to the finals from there. Looking back, I think that was probably one of the biggest wins of her career. (CC2)

1.5.2.4.3. Pressure

The athletes made an effort to concentrate on the process rather than the outcome of their performance when they attended high profile events like the Olympics and World Championships but despite this, they experienced a lot of pressure and stress. One coach summarized the Olympic experience and discussed his role in helping the athletes cope with the pressure of performing.

It's something hard to describe when you're at the Olympics and it's very different than anything you ever do in many ways. Everybody is watching you all of a sudden. It's the pinnacle of what you've been dreaming about since you've been a little kid. You have this little card that enables you to go places where police can't go. It's all these different things put together that make you feel like, "Wow, I'm this really special and unique person. It must mean that I have to skate really fast." The athletes end up with this enormous pressure on them. Even if they have the best race plans and the best strategies, it's just hard for them to not be aware of it. As coaches, we play a crucial role. I constantly try to be positive and keep them rational

and show them that that's what they've done all year. It's what they can continue to do. It's just another race. Instead of getting afraid of the excitement, I help them embrace it and be happy about it. (CC1)

1.5.2.4.4. Post-competition demands and setbacks

Pressure was felt by the athletes not only before and during important competitions, but also after they were over. Some parents and coaches shared interesting information regarding some of the setbacks and demands the participants faced after they became World and Olympic champions. In one case, R1's mother and coach revealed that she did not perform well after winning the World Championships because she was afraid that she would not be able to maintain her performance until the next Olympics. With the help of her coach, R1 eventually regained her confidence and focus.

After she won the World Championships, she really got very depressed because she thought, "My gosh, here I am. I'm the World champion and I have two more years to go before the Olympics. Can I stay the best in the world for two more years?" She never told me anything about that, she always sounded very up. We only learned this after she finished her competitive career. She said that finally one day she got up and literally kicked herself in the butt and said, "What's the matter with you?" And then she got going again. (PR1)

After the '86 World Championships when she won all three events, solo, duet and team, she had a real struggle with that. She had a real fear that, "Oh, I don't know if I can do this again." When you're the best in the world, everybody tries to beat you so you fear not being able to do it

again. It kind of paralyzed her. She lost her confidence and her performance really went down hill. You could see it, it was written all over her face. She didn't train well and we did some testing and her tests weren't very good. So we had to talk a lot about how she was going to deal with this fear. And that's part of when we came up with the idea of just working on improving herself and not worrying or thinking a lot about the competition or how she was going to do. When we did that, everything fell back into place. (CRI)

One father reported that his son's attitude also changed after he became Olympic champion. His intensity and desire decreased for a period of time and his performance consequently suffered. He eventually realized that he wanted to continue doing well and maintain his performance yet his father believed that his intensity would never be the same due to the fact that he had already won a gold medal.

It's very difficult to maintain after you win the highest award. For most athletes, there's a down after a high. They say, "I won the Olympics. There's nothing higher than that. Now what do I do? Everybody is going to be coming after me." After the Olympics, he didn't care about track and field as much as he did before. His living was still running track meets and making money and if he took second or third, he still got paid. But he realized, "Ok, I'm getting paid but I have a reputation to keep as Olympic champion." He's now trying to build himself back up for the 2000 Olympics but even then, the intensity will not be the same. He might say, " Hey, I

already have a gold medal so if I win another one fine, if I don't, I can't worry about it." (PC3)

As previously mentioned, one athlete felt extremely pressured by the public and media after he became Olympic champion. His father shared his son's concern that the demands that resulted from his overnight fame interfered with his training and need to rest, and consequently affected his performance.

Sometimes he would get annoyed at all the demands. He wished he could rest a bit more. He always had obligations and still does today. He was almost a victim of his own glory when you think about it. They just didn't let go of him. I know it, I was answering the phone. I don't know how many phone calls we would get in one day. We also had to go to all the schools. I guess it's normal to have these demands but we really didn't expect this. We couldn't even imagine it even though we had been warned. We told ourselves that it wouldn't be that bad but it was. (PC5a)

C5's father also mentioned the following about the media and the pressure that was put on his son to win. It was interesting that C5 was not able to isolate himself from the media at the Olympics like other athletes had. In a way, he felt obligated to speak to reporters and the public to promote his sport because it was not that well-known at the time.

When you're at the top, everybody looks at you. It was harder for him because everyone was expecting him to win all the time. He didn't agree with this. He was also constantly solicited. Sometimes he was more popular in Europe than here. Reporters were running after him. The night

before a competition, everyone was after him for interviews and he almost didn't have time to train and that affected his performance. At the beginning, he didn't really want to refuse any demands because everyone was happy that he had won and he didn't want to deceive them. Also, he knew that his sport was not well-known so he would tell himself, "If I refuse this, it might be one less chance that I get to help my sport evolve and move forward." So in a way, he sacrificed himself. (PC5a)

1.5.2.4.5. Balance

Balance was an issue that was discussed by two of the coaches. They believed that it was important for the athletes to engage in other activities outside of their sport to change their focus and to allow themselves to mentally recover from the excessive demands placed upon them at this level. One of the coaches mentioned, however, that at one point, R1 was getting too exhausted from engaging in extra activities when she was intensively preparing for the Olympics.

I think it was important for her to have an emotional healthy balance so that when she was at the pool training, she could train effectively, and when she went home, she could let it go for a while so that she could rest and recover. She had a part-time job and she worked for that first six months of the Olympic year. That actually helped her because then when she went home, she was focusing on something else. But there did come a point when she was just getting too tired. (CR1)

I think she manages to keep some balance by doing other things on the side. She still likes to play volleyball, badminton, and squash every once in

a while. She played slow pitch during the summer. She's a really active person and has a high amount of energy so she never sits still for very long. She's taking a dance class once a week right now that she sees as professional development. She also teaches dance at school, so it's things like that. (CC2)

In sum, the athletes developed several strategies to prepare for important competitions. Developing an appropriate mindset, engaging in self-talk and visualization, visiting the competition site ahead of time, watching videotapes of opponents and staying away from the media were all useful tactics that helped them to remain confident and focused. The coaches were in agreement with the athletes that concentrating on the process rather than the outcome of performance was more important. This in turn helped the athletes to cope with the pressure they often felt when they went to the Olympics or World Championships. According to some coaches and parents, setbacks and excessive demands were not uncommon after winning a gold medal at these events.

The next section includes recommendations from the athletes, coaches, and parents regarding what children need to do to excel in sport, and how parents and coaches should guide them through the process.

1.6. Recommendations

All of the athletes, parents, and coaches were asked what they would recommend to children who want to become the best in a sport. They were also asked what they would recommend to parents and coaches who are involved in this process. The athletes' suggestions will be presented first, followed by those of the parents and coaches.

1.6.1. By Athletes for Athletes

All of the athletes said that it is very important for children to love their sport and to have fun. They emphasized the need to have goals, determination, and a strong work ethic. They also advised them to take risks, trust their instincts, and to do it for themselves rather than for others.

First of all, you have to enjoy what you do because if you don't, then you're not going to put in the time and it requires a lot of time, effort, and commitment to do it. You have to do it for yourself and nobody else. You have to have perseverance and dedication so that no matter what anyone says to you, you have a path and a goal that you can set your mind to. When road blocks come up, you know what you're going to do and you just push them aside and keep going. You have to be tough mentally and physically to do that but if you love to do something, it makes it that much easier. Hard work is one of the most important things because if you want to be good at something, you have to work at it. I don't think there is any magical formula. Also, you can't get too caught up in what you need to do to be a peak performer. Just do what comes naturally. Stick to the basics,

and work hard. I guess having a little bit of luck and natural ability helps too. (C4)

I would say, "First of all, you have to make it fun and you can't be afraid to take risks. You can't be afraid to take a gamble in life if you really want it bad enough. Just go for it because you're the only one who can make it happen." (R1)

I would first ask the kid, "Is it you or your parents who want you to become the best in the world?" If he would say that it was him, then I would tell him, "Think positive, work hard, but mostly, trust your instincts. Your body will always guide you on the right track and when you're not sure, keep your distance. Your instincts will never lie to you." In terms of the sport experience, I would say, "Put your heart and soul into it and enjoy yourself every moment of the way." (C5)

I would tell the kid, "If you love a sport and have fun doing it, you can live the dream and get through the obstacles. But you have to keep striving for something, whether it's sport or anything else because that's how people stay satisfied and happy. Some athletes have a post-Olympic depression because they have trouble going on after an experience like that because they have sort of set their level here. They get there and then they don't know what's beyond. So you have to keep at it." (C1)

The next four athletes also said that it was important for children to have fun but they also discommended focusing on the goal of wanting to become the best in the world.

According to them, children should have a goal but they should set it aside so that they can enjoy the process of improving in their sport.

I think that it is something that you can't dwell on. I think you just have to pick your activities and have fun with them. Don't put so much pressure to become the best in the world because there are only going to be so many who are going to be the best in the world. They are very select. If that is your big goal, there is a good chance that you are not going to make it. Don't focus on that, if it happens it will happen. What you have to do is pick a sport and work hard at it. Find out what you need to do to become the best at the sport, do those things and have fun with it. If you are not having fun with it, it is not going to happen. You have to have a goal but put it in the top shelf somewhere and close that drawer. It's there but don't dwell on it otherwise you will get burned out. (C2)

I would tell the kid that he should not concentrate on being the best in the world right now. He should join his local track club in his community and he should have fun with it and concentrate on each meet and each weekend and just try to do the best that he can at each meet. And if he continues to enjoy it, he can take it to the next level. You really can't focus on being the big champion when you are that young but you can focus on doing your sport to the best of your ability and try to do a little bit better each time you compete. You have to be a student of the sport. (C3)

What I've started telling kids is to always make sure they're having fun and to never put too much importance on the outcome of a race. And this

includes the outcome of even doing a best time. Whether you win or lose really doesn't matter. It's how you play the game. I never put a whole lot of importance on winning but I did think it was really important to do a best time. I wouldn't even say that to them right now. What's really important is that they walk away from a race, test, game or anything, just knowing that they did their best. (R3)

I'd say first of all, you have to enjoy what you're doing. If you have the attitude, "Oh, I have to go to practice today," it's going to be difficult. To me, if you love it and enjoy it, it doesn't seem like work all the time. Then, the next thing is you have to dedicate yourself to giving your best effort every time you're out there and make yourself the best that you can be. If you do that, then that's really all you can ask of yourself, regardless of the outcome. You also have to be willing to make some sacrifices too. But I think the experiences that you get through sport and the friends that you make throughout are worth the little sacrifices that you have to make along the way. (C6)

In the next two citations, two athletes suggested that children practice all aspects of their performance, including the mental side. Engaging in high quality training and always stretching their limits was also recommended.

You must work on your real potential and not focus on the outcome. Never accept borders because there are no borders. If your mind accepts limits, then it's all over. You must train the borders of resistance and learn that limits are not what you expected them to be. Stretch what you think is not

possible, this includes mental training. Be aware that there is an interaction between quantity and quality. At the right time, switch to quality training. If you just have quantity, then you lose all awareness. It knocks you down and you run to exhaustion. Finally, love your sport, it's an obsession that you need to get through the hard training. (R2)

I think if you want to become an exceptional performer, you have to choose one thing and spend a lot of hours on it. You have to work on your weaknesses. Those are the things that you have to practice more even if they aren't as much fun. I would say certainly get into the mental side of things because to me, when you get to a certain level, that's what is going to separate you from the next person. The physical differences aren't going to be that much. (R4)

1.6.2. By Athletes for Coaches

The athletes also made recommendations for coaches. The next citations highlight the fact that coaches should be aware of their athletes' needs and know when to push and not to push them. It was recommended that they provide children with a nurturing environment in which they can be positively challenged and have fun.

Each athlete is different so they should really know the athletes. They shouldn't push the ones who don't need to be pushed, yet they should be more aggressive with those who do need a push. Coaches have to be great people persons. The less they know their athletes, the less they will become what they can be. (C1)

Know when to push but know when to pull back. Don't think that too much is always the best, like too much training will make the athlete better. That's not always the case. Know when to give them a kick in the butt but know when to praise them for a job well done too. Also, always make it challenging and always make them feel proud of themselves after every practice. (R1)

It is important to focus on technique at a very young age but it is not necessary to work the kids too hard. You want them to practice significantly but you don't want to push them until they fall on the track. Coaches have to realize that it should be fun for them at that age, and then when they start getting into high school, their workouts should become a lot more intense. (C3)

If I was a coach, I would just make it as fun as possible at that age. It wasn't that way as much when I was swimming at that age. They just tried to make you swim a lot of laps and get used to swimming. I think now that the most important thing is to teach kids good habits, make it fun for them, and make sure they don't get burned out. (R3)

Two athletes recommended that coaches focus on the process rather than results to take the pressure off their athletes. Making it fun for them, giving them positive feedback, and providing opportunities for success was also advised.

I think they should give their athletes lots of positives and not dwell on the results. If their athletes go to a tournament and they wrestle tough, they should be really happy about that. I know a lot of coaches who put a lot of

pressure on their kids to perform well and I think a lot of the time, the kids are afraid of letting them down. They have to let their athletes know that no matter what happens, they will be proud of them and be there for them.

(C2)

Don't push them too hard too soon at a young age. Work on the basics and keep it a fun environment and don't place too much emphasis on winning or competition at too early of an age. Just encourage them, instill a love of the sport first and get them to enjoy it. Then as they get older, obviously things get a little more competitive and the outcome becomes a little bit of a focus. But at the same time, you can build in smaller performance goals rather than always focus on winning and losing, Just try to make it so that there's always some form of success and then that way, you're still keeping it fun and giving people a sense of accomplishment. Show enthusiasm and support the athletes both on and off the ice so that if they're having problems, they can come and talk to you and not feel threatened and scared of you. Try to have a good relationship with the players and realize what each person needs.

Everybody responds differently to different types of criticism or motivation so just get to know the players and realize what will make each one tick.

(C6)

1.6.3. By Parents for Athletes

Recommendations for children who aspire to become exceptional athletes were also made by the parents. Common perceptions were that they need to enjoy themselves and focus on doing their best. They must also be dedicated and work hard.

They have to first figure out what they want to do. If it's swimming, a lot of it depends on their age, practice, dedication, finding a good coach, support from their family, and learning how to handle themselves. They have to be a good sport and a good loser because everybody's going to lose at some point or another. But most of all, they have to enjoy the sport and do it not for what they can get out of it, but for the enjoyment of the sport, meeting new people, going new places and that sort of thing. And if it happens, it happens. There are only a few people who get to be World champions, and it's usually a combination of hard work, dedication, and a little bit of luck maybe thrown in there. (PR3)

I'd say follow your heart. If you love something, work at it, and be the best you can be at it. It doesn't matter if you're the best in the world, as long as you've done the best you can do. I think it takes a lot more than just talent. There are a lot of people who have talent but you have to have the whole package. You have to have the physical strength, the desire to give the hours of work, and the dedication to try to be the best you can be no matter where that places you. I think that when you have that, you have that for life. It doesn't matter if it's for a sport or anything else. (PR1)

You have to work and enjoy what you do. This is the message my son relayed when he visited the schools. He would say, "I lived in a big city. There were no mountains there but my dream was to become world champion and I realized it. So why wouldn't you be able to? It's possible. You have to work hard and love what you do." (PC5a)

If you want to go after something, do it and don't be afraid to ask for help. Just do the best you can. Usually, if you continue with something, you'll have some type of achievement in that particular area as long as you stick with it. It takes some longer than others but usually if you stick with it, you'll get it. (PC3)

You have to practice. If you aren't practicing every day, you're not going to do it. It takes hard work. You might as well know right away. It's not going to come to you fairly easily at all. (PC4)

You have to have a goal, be focused and dedicated, and you have to work hard at it. Work on your skills and never give up. You never know how good you can be until you try. (PC6)

1.6.4. By Parents for Coaches

The parents also made recommendations for coaches. One parent reported that coaches should be supportive and make it fun for children. Another also recommended that they be positive but fair as well.

Coaches have to realize that they're not parents. They have these kids an hour or two per day. They need to make the sport fun for the kids and not

breathe down their throats and threaten them or anything like that. They need to be supportive of the kids and understand when they are going through changes or difficult times. (PR3)

Always be positive and compliment them if they've done something very well. Some coaches are afraid to compliment in case the kid starts to think, "I'm so good, I don't have to work hard." But I think there's a happy medium there. Also, try not to have favorites even though it's very hard not to. You're bound to click with some people more than with others, that's life. But just because you don't like somebody's temperament and you like somebody else's better because she has a cute smile, that is no reason to not treat them all the same. (PR1)

1.6.5. By Parents for Parents

Parents provided recommendations for not only athletes and coaches but also for other parents. Common suggestions were that parents should encourage their children to pursue a sport they enjoy and allow them to develop at their own pace. They should also refrain from putting pressure on them to win or be the best. Their happiness should be their priority.

Our kids have had friends and I've always noticed that there are a few parents who expect their child to be first. They never have the attitude, "Let your kids participate and enjoy it." You shouldn't expect them to be the best because then it's always a let down for them. Let them work their way up. I always fear parents who want their kids to win first and think

that to enjoy the sport, you have to be first. Don't let the children get that attitude. You can enjoy a sport without being the best. (PC2)

Don't push, just let them go at their own pace, it's their thing. Just encourage them, be with them, and love them but never push them. (PR4)

Stay out of it. Support the kid, but don't have anything to do with the coach or their performance or their training. Don't butt in. Maybe it helps when you really don't know anything about the sport because then you don't try to advise them. I've seen it too much in other families where parents ask for favors and butt in, and the coaches get all upset. To me, a parent should stay out of it other than give their kid support. (PR1)

The first thing is that you have to support them the best way you can. Another important point is that you can't force them. You have to let them go at their own pace. We knew parents who told their son, "If you don't do better than this, we will cut you off." I couldn't believe it when I heard this. You have to encourage and motivate them and tell them that you are happy with whatever they do. (PC5b)

I think the main thing is to be supportive and encouraging. In my case, I had doubts but she never heard them. She was doing what she liked to do so I didn't see a problem. Where I have difficulty is when kids are forced to do something that they really don't want to do. You are not doing yourself or them any favor by doing that. (PC6)

I think there are so many opportunities out there for kids these days and parents will have them doing things when they're three and four years old. If you try enough things, you will find something that they are natural at. But you have to be there for them, encourage them, and give them the self-confidence to pursue whatever it is they want to pursue. Some people might not even want to pursue what they are natural at. They may want to do something totally different. If that's going to make them happy, you have to support them. But don't push them. I really believe it's more important that they be content and happy with what they do than it is to be out there for the money or the glory. (PR3)

Always support them as long as it's something positive that they want to try to do. Never give up on them and never be negative about them. You see a lot of parents saying, "Why are you doing this anyway, you're not going to be good at it." I would advise parents not to do that. They have to find out how good they are themselves. They could be the worse in that area but as long as they enjoy it and want to do it, support them. (PC3)

I'd recommend that they let them try as many sports as they could. Don't just say, "Oh, you're going to be a hockey player." They're going to be anything they want to be. Just take them out and try different things and give them a chance to play, not the idea, "We're going to play games and get real good," no, just play. Get out there and spend some time with them rather than say, "Here's a ball, go and play." That's the biggest thing. Get involved and encourage them. (PC4)

1.6.6. *By Coaches for Athletes*

Coaches also provided recommendations for children desiring to excel in a sport. Two coaches suggested that they choose to pursue a sport because they love it and it makes them happy. Like the athletes and parents, they recommended that children refrain from focusing too much on winning or becoming the best.

If a person would come up and say, "What can I do to be the best skater in the world?" I would say, "You're probably never going to be the best skater in the world because you're probably too focused on skating." If you're very focused, it's great but if you're too focused, you lose perspective on everything else. Sport is something that you can take really far and you can become really focused at times but if you don't have the perspective that it is just a sport, and you're like that all the time, you are not going to be happy. And if you're not happy, you're not going to be very positive and you probably won't do super great. I think that you can have the focus and make the sacrifices that you have to do to be the best in the world, but you can also keep perspective. (CC1)

When I talk to athletes, I always talk about having a positive outlook and I look at the motivational side of things. I ask them, "Why are you here?" Are you here to be World champion because if that's the only reason you're here, if that's all you care about, that's not what's most important. You have to love what you're doing and then whatever success you have is going to be a bonus. So when most people start getting stressed out in a National final, I just say, "Ok, how many tournaments have you

wrestled?" They'll say, "Probably 50 tournaments." "Are you going to wrestle any tournaments after this tournament?" " Yeah." So I say, "Ok, remember that. This isn't the first tournament you wrestle and it's not going to be the last so just keep it in perspective. It's just another match, another opponent. Now why are you here?" And they're like, "What do you mean?" "Well, why did you start wrestling?" "Well because I love wrestling." "Ok, that's why you wrestle. You're not wrestling because of that medal. The very first day you came into a wrestling practice, you had a lot of fun and no one told you about winning a gold medal. You learned about the sport. You developed and improved in the sport because you have a love for it and that's what's going to help you stay focused and be successful. But I think if you're not as successful as you'd like to be, you'll be more accepting of that as well just because you know you're doing it because you love the sport and not because you want a gold medal. That's what's most important." (CC2)

The following coach highlighted the fact that athletes need to work hard, dedicate themselves to their sport, and believe in themselves.

I would tell them to go find the best coach that they can find and to be prepared to give 500%. I would tell them to believe and make their sport their life for so many years. (CR1)

1.6.7. By Coaches for Coaches

The coaches also made recommendations for other coaches. All three coaches had different views. One of them suggested that coaches be positive, creative, and work as a team.

I would say be positive. I'm not sure that coaches always realize that when they're telling someone to correct something they're essentially saying, "You're doing something wrong." So one thing that I would really recommend is to have days where you only say positive things. Spend three days out of seven days in training where you just tell them what they're doing right. It's a pretty amazing thing. It's pretty simple. It's something that I've done for a long time. The next thing that I would say is to really try to be creative and have fun that way. There are lots of things that you can do rather than doing the same thing over and over again. When it's fun, it becomes more positive and everybody is happy. There are lots of creative ways to make it fun. I used to put riddles on my programs. We'd make positive books. If you're not trying to be creative enough and not trying to be fun, maybe you shouldn't be coaching anymore. You need to take a break. The third thing that I would say is work as a team. If you have a good team concept, you can really bring your team up and really improve even in an individual sport. (CC1)

The following coach recommended that coaches help athletes become confident and independent and improve various aspects of their performance.

I don't believe everybody can be a World champion. I used to when I was young but I don't think everybody has necessarily the physical and mental abilities to do it. But I think everybody can improve the technical, physical, and mental areas of their performance. I think it's important for coaches to get athletes to develop themselves. The best coaches coach themselves out of a position because they teach athletes how to work on building and exploiting their strengths and eliminating their weaknesses so that in the end, they don't need anybody. They can go out and do it on their own because they are truly confident and competent. (CC2)

Another coach emphasized the importance in instilling confidence in athletes and helping them set realistic goals.

They should coach the belief first. It's all about confidence and believing and seeing it happen. If you believe that the person you are coaching cannot reach the top, then you have to set different goals. You have to be honest with them at all times. (CR1)

In sum, several recommendations were made by the participants to guide the pursuit of athletes, parents, and coaches in sport. Enjoyment, dedication, hard work, and support appear to be the most important factors they should take into consideration.

Summary of Interview Data

The results that emerged from the interviews with the athletes, coaches, and parents in the first phase of the study are summarized in Table 8. The most salient factors perceived to be important during the sampling, specializing, investment, and maintenance years are presented. The darker the color in the table, the more important the factor was

deemed in that particular stage of the athletes' career. Most contextual factors were important throughout the lives of the athletes. All factors pertaining to personal characteristics were important from their early to late years of development. Training factors were progressively more important as the athletes reached higher levels in their sport, except for fun and variety, which were exceptionally more important during the early years of development. Factors concerning competition also appeared to be increasingly more important as the athletes moved toward the maintenance years. Although having fun during competitions was important throughout their lives, it was most important during the sampling years. Focusing on the process rather than the outcome of performance appeared to be an important factor throughout the athletes' career.

This section concludes the results of the first phase of the study. In the next section, results pertaining to the concept mapping activity will be presented.

Table 8

Summary of Factors Perceived to be Important During the Sampling, Specializing, Investment, and Maintenance Years

Factors	Sampling Years	Specializing Years	Investment Years	Maintenance Years
CONTEXT				
Parents				
Coaches				
Friends / Teammates				
Support staff				
Other athletes				
School				
PERSONAL CHARACTERISTICS				
Love for sports				
Self-confidence				
Determination				

Note.  = Very important,  = Important,  = Less important

Table 8 (continued)

Factors	Sampling Years	Specializing Years	Investment Years	Maintenance Years
PERSONAL CHARACTERISTICS				
Motivation				
Strong work ethic				
TRAINING				
Fun (deliberate play)				
Variety				
Technical training				
Tactical training				
Physical training				
Mental training				
Intensity, hours of training (deliberate practice)				
Quality, innovation				

Note. ■ = Very important, ■ = Important, ■ = Less important

Table 8 (continued)

Factors	Sampling Years	Specializing Years	Investment Years	Maintenance Years
COMPETITION				
Fun				
Competition planning				
Focus on process rather than outcome of performance				
Distraction control (pressure, high expectations, media)				
Evaluation				

Note. ■ = Very important, ■ = Important, ■ = Less important

2. Phase 2 – Concept Mapping

The second phase of this study involved a concept mapping activity that was performed with three of the ten athletes. The reader might refer to the last section in the methodology chapter for a description of the steps involved in building and interpreting the concept maps.

2.1. Ratings

The athletes' ratings of the 165 index cards are presented in Table 9. Note that the five broader categories, Context, Personal Characteristics, Training, Competition, and Organization, were not rated. The ratings varied between 1 and 7 based on the 7-point Likert scale that was included on each index card. A value of 7 indicates that the factor represented on the index card was perceived as very important in the development or maintenance of the athletes' performance whereas a value of 1 denotes the opposite.

Difference scores were compiled to show the difference between the athletes' ratings for the development versus maintenance of their performance. Although various difference scores were obtained, only those that exceeded ± 4 were highlighted in the table and subsequently addressed in the Discussion section. The cut-off figure of ± 4 was chosen because it was felt that it reflected a significant difference between the ratings of the athletes.

The athletes did not have to include every index card in their map therefore there are no ratings for those that were not included. Moreover, sometimes the athletes rated the importance of a particular factor only for the development years because it was not applicable in the maintenance years, or vice versa, thus only one rating was provided for those particular index cards and a difference score could not be compiled.

Table 9

Athletes' Ratings of the Index Cards

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
1		6	6	0	7	7	0	7	7	0
2		7	7	0	7	7	0	5	5	0
3	I was involved in community functions.	4	7	+3	2	7	+5	1	2	+1
4		7	7	0	7	7	0	6	6	0
5		5	7	+2	7	7	0	4	4	0
6		6	6	0	7	7	0	7	7	0
7		6	6	0	7	7	0	6	6	0

Note. Dev. = rating of the importance of the factor for the development of their performance. Main. = rating of the importance of the factor for the maintenance of their performance. Diff = difference score between Dev. and Main.

Table 9 (continued)

Index Card	Statement	C2		C4		R3	
		Dev.	Main. Diff.	Dev.	Main. Diff.	Dev.	Main. Diff.
8		5	5	0	7	7	0
9		5	5	0	7	5	-2
10		5	7	+2	7	7	0
11		5	6	+1	7	7	0
12		4	7	+3	6	6	+1
13		5	5	0	7	5	0
14	My siblings had a positive influence (ex. supportive, learned from them).	7	3	-3	7	7	0
15		7	6	-1	7	7	0
16		7	5	-2	7	7	0
17	The fact that I grew up in my particular hometown was influential in my career.	6	2	-4	7	7	0
18		7	4	-3	7	7	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
19		5	6	+1	7	7	0	5.5	5.5	0
20		5	7	+2	7	5	-2	6	6	0
21		6	7	+1	7	7	0	6	6	0
22		6	7	+1	7	7	0	4	4	0
23	I participated in a variety of sports.	7	6	-1	7	7	0	5	1	-4
24		-	-	-	-	-	-	-	-	-
25		5	7	+2	7	7	0	3	6	+3
26		4	7	+3	6	7	+1	4	6	+2
27		6	5	-1	7	7	0	6	6	0
28		5	7	+2	7	7	0	5	7	+2
29		5	7	+2	7	7	0	4	5.5	+1.5

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
30		6	6	0	7	7	0	4	6	+2
31		7	7	0	7	7	0	5	7	+2
32		5	7	+2	7	7	0	5	5	0
33		6	7	+1	7	7	0	7	7	0
34		5	7	+2	4	6	+2	7	7	0
35		7	7	0	5	7	+2	2	2	0
36		5	7	+2	7	7	0	6	6	0
37		7	6	-1	7	7	0	6	6	0
38		5	6	+1	7	7	0	6	6	0
39		6	4	-2	7	7	0	4	6	+2
40		7	7	0	7	7	0	4	4	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
41		6	6	0	7	6	-1	6	6	0
42		6	6	0	5	7	+2	4.5	3	-1.5
43	I had the opportunity to compete a lot / play many games.	6	6	0	7	3	-2	6	5.5	-0.5
44		5	7	+2	5	5	0	5	6	+1
45		6	6	0	7	7	0	5	5	0
46		6	6	0	7	7	0	7	7	0
47		5	7	+2	7	7	0	6	6	0
48		6	4	-2	7	7	0	7	7	0
49	I had a variety of coaches.	7	4	-3	5	5	0	1.5	7	+5.5
50		6	6	0	7	7	0	7	7	0
51		5	7	+2	5	6	+1	6	6	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
52		6	4	-2	7	7	0	6	5	-1
53		6	7	+1	5	7	+2	7	7	0
54	My school teacher had a positive influence.	6	2		7	7	0	5	1	-4
55	I had a fitness trainer.	1	6		3	5	+2	-	-	-
56		6	-	-	7	5	-2	4	4	0
57		4	4	0	7	7	0	-	-	-
58		4	7	+3	7	7	0	3	6	+3
59		4	7	+3	5	7	+2	5	4	-1
60		5	6	+1	7	7	0	5	6	+1
61		5	6	+1	-	6	-	5	6	+1

Table 9 (continued)

Index Card	Statement	C2		C4		R3	
		Dev.	Main.	Diff.	Dev.	Main.	Diff.
62	I had financial resources (ex. from parents, sponsors, sport associations).	4	7	+3	3	7	+0.5
63		4	7	+3	7	7	-
64		4	6	+2	4	4	-
65		4	7	+3	6	6	-2
66	Tactical training was important (ex. developing tactics, strategies).	5	7	+2	7	7	0
67		5	7	+2	2	7	+1
68		4	7	+3	7	7	0
69		5	7	+2	2	5	+2
70	Training was structured.	5	7	+2	5	7	+2
71		4	6	+2	7	7	0
72		6	5	-1	2	7	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
73		6	6	0	4	7	+3	3	5	+2
74		6	7	+1	7	7	0	5	6	+1
75		2	2	0	1	4	+3	-	-	-
76	Other people's high expectations affected my performance during competitions.	2	6	+4	7	7	0	3	5.5	+2.5
77		4	6	+2	5	7	+2	3	5	+2
78		4	7	+3	7	7	0	4	6	+2
79		5	7	+2	7	7	0	3	3	0
80		6	7	+1	7	7	0	6	6	0
81		2	2	0	7	7	0	3	5.5	+2.5
82		5	7	+2	-	7	-	3	6	+3
83		5	6	+1	7	7	0	5	5	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
84		6	7	+1	7	7	0	6	6	0
85	I was a leader.	3	7	+4	5	6	+1	3	3	0
86	I was innovative in my sport.	5	7	+2	7	7	0	2	6	+4
87		4	7	+3	7	7	0	6	6	0
88		5	7	+2	5	5	0	5	5	0
89	My partner had a significant influence.	1	7	+6	-	-	-	-	-	-
90		4	7	+3	5	7	+2	3	5	+2
91		5	7	+2	6	6	0	3	3	0
92		7	5	-2	7	7	0	6	6	0
93		5	7	+2	7	7	0	5	7	+2
94		7	5	-2	7	7	0	6	6	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
95		3	6	+3	6	5	-1	3	4.5	+1.5
96		-	-	-	7	7	0	-	-	-
97		5	7	+2	7	7	0	4	4	0
98		-	-	-	7	7	0	5	2	-3
99		4	6	+2	7	7	0	4	4	0
100	I engaged in activities such as meditation, Zen, or hypnosis.	5	7	+2	1	5	+4	-	-	-
101		-	-	-	5	7	+2	-	-	-
102		5	7	+2	7	5	-2	6	6	0
103		4	6	+2	5	7	+2	5.5	4	-1.5
104		5	7	+2	7	7	0	5	6	+1
105		4	7	+3	7	7	0	7	7	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
106		5	7	+2	7	7	0	4	7	+3
107		6	4	-2	7	7	0	4	6	+2
108		6	4	-2	7	7	0	5	6	+1
109		5	6	+1	6	6	0	4	4	0
110		5	7	+2	6	5	-1	5	5	0
111		5	7	+2	7	7	0	5	7	+2
112		5	7	+2	7	7	0	5	5	0
113	Training was regimented.	6	7	+1	2	7	+5	4	4	0
114		5	7	+2	7	7	0	3	6	+3
115		5	7	+2	3	5	+2	6	6	0
116		7	5	-2	4	4.5	+0.5	4	6	+2

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
117		5	6	+1	3	4	+1	3	6	+3
118		5	7	+2	7	7	0	5	7	+2
119		-	-	-	5	7	+2	6	6	0
120		7	7	0	7	7	0	3	4	+1
121		5	7	+2	5	5	0	3	1	-2
122		4	7	+3	7	7	0	4	3	-1
123		6	5	-1	5	5	0	3	3	0
124		5	2	-3	7	7	0	3	5.5	+2.5
125	I experienced pressure from the media at important competitions (ex. Olympics, World Championships).	1	1	0	1	4	+3	2	6	+4
126		1	1	0	5	4	-1	4	3	-1
127		4	7	+3	7	7	0	6	6	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
128		2	5	+3	-	-	-	5.5	4	-1.5
129		-	-	-	7	7	0	-	-	-
130		4	7	+3	7	7	0	6	6	0
131		4	7	+3	5	7	+2	5	6	+1
132		5	7	+2	7	7	0	6	6	0
133		2	4	+2	3	5	+2	-	1	-
134		5	7	+2	7	6	-1	2	5.5	+3.5
135		5	7	+2	7	7	0	6	5	-1
136	I evaluated my successful performances (ex. wins) after competitions.	3	7	+4	3	7	+4	7	7	0
137		3	6	+3	-	3	-	1	1	0
138		6	7	+1	7	7	0	4	6	+2

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
139		4	1	-3	-	7	-	3	4	+1
140		6	7	+1	5	5	0	2	2	0
141		5	7	+2	-	2	-	1	1	0
142		5	7	+2	7	7	0	7	7	0
143		5	7	+2	7	7	0	6	6	0
144		7	5	-2	5	7	+2	4	6	+2
145	I worked with a mental training / performance enhancement consultant.	4	7	+3	3	6	+3	1	7	+6
146	I moved to another city to train.	6	7	+1	3	7	+4	7	7	0
147		5	6	+1	-	-	-	3	6	+3
148		5	7	+2	6	5	-1	5	6	+1
149		5	7	+2	7	7	0	3	3	0

Table 9 (continued)

Index Card	Statement	C2			C4			R3		
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
150		4	7	+3	7	7	0	4	4	0
151		6	4	-2	1	1	0	2	4	+2
152		5	7	+2	5	6	+1	4	7	+3
153	I centralized to train for important competitions (ex. Olympics, World Championships).	6	7	+1	1	5	+4	1	1	0
154	I felt at peace / comfortable before competitions.	5	7	+2	-	-	-	1	7	+6
155		6	4	-2	4	6	+2	3	6	+3
156		4	7	+3	4	6	+2	4.5	6	+1.5
157		1	-	-	-	-	-	-	-	-
158		4	7	+3	5	7	+2	3	6	+3
159		5	7	+2	7	7	0	6	6	0

Table 9 (continued)

Index Card	Statement	C2				C4				R3			
		Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.	Dev.	Main.	Diff.
160		1	2	+1	5	4	-1	1	4	+3			
161	I experienced early success in my chosen sport.	7	2	-5	6	6	0	6	6	0			
162		5	7	+2	7	7	0	4	5	+1			
163		5	7	+2	7	7	0	7	7	0			
164		7	5	-2	7	7	0	1	4	+3			
165	I experienced pressure from the public <u>after</u> important competitions (ex. Olympics, World Championships).	1	5	-4	-	5	-	3	3	0			

The frequencies of the “difference scores” for each athlete are presented in Table 10. There were no differences (i.e., null score of 0) in the ratings of C2 for 25 index cards. In the case of C4, there were no differences for 102 index cards, and for R3, it was for 77 index cards. This suggests that several factors were perceived as being important, somewhat important or not important for both the development and maintenance of their performance. Nonetheless, some of the factors were perceived differently (i.e., high difference score) which suggests that their contribution during the development years was different than that during the maintenance years. Difference scores that exceeded ± 4 were obtained for 25 of the 165 index cards.

It is noteworthy that 13 of these 25 index cards pertained to the context of the athletes (i.e., index cards # 3, 14, 17, 23, 43, 49, 54, 55, 62, 89, 145, 146, 161) and 7 of these 13 cards concerned resources (i.e., index cards # 14, 49, 54, 55, 62, 89, 145). In terms of the context, being involved in the community, moving to another city to train, and centralizing to train was perceived as more important in the maintenance years than in the development years. On the other hand, being raised in a particular hometown and having the opportunity to participate in a variety of sports, compete a lot, and experience early success in sport was perceived as being more important during the development years.

Furthermore, resources such as siblings, sport psychologists, fitness trainers, partners, having a variety of coaches, and financial resources were perceived as more important during the maintenance years. Teachers, on the other hand, were perceived by two of the three athletes as having more influence during the development years.

Table 10

Frequencies of Difference Scores for Each Athlete

Difference Score	Athlete		
	C2	C4	R3
0	25	102	77
+0.5	-	1	1
+1	22	5	14
+1.5	-	-	3
+2	53	19	19
+2.5	-	-	3
+3	25	5	13
+3.5	-	-	1
+4	5	5	3
+5	0	4	0
+5.5	-	-	1
+6	1	-	2
-0.5	-	-	1
-1	6	7	5
-1.5	-	-	3
-2	13	4	3

Table 10 (*continued*)

Difference Score	Athlete		
	C2	C4	R3
-3	4	-	1
-4	2	1	2
-5	1	-	-
-6	-	-	-
Total	157	153	152

Note. The above numbers do not add up to 165 because the athletes did not rate or include all of the index cards in their concept map.

Also, 5 of the 25 cards that were rated differently between the development and maintenance years pertained to training (i.e., index cards # 67, 72, 100, 113, 153).

Engaging in structured and regimented training activities was viewed as more important during the maintenance years, as was tactical training and activities such as meditation, Zen, or hypnosis.

Another 5 of the 25 index cards regarded competition (i.e., index cards # 76, 125, 136, 154, 165). Pressure from the media and other people's high expectations at important competitions as well as pressure from the public after important competitions were perceived as more important during the maintenance years compared to the development years. Feeling comfortable and at peace before competitions and evaluating

successful performances after competitions were also perceived to be more important during the maintenance years.

Only 2 of the 25 cards targeted the athletes' personal characteristics (i.e., index cards # 85, 86). Being a leader and being innovative in sport were perceived as more important in the maintenance years than in the development years.

It is noteworthy that the 25 high difference scores varied across the three athletes. There were only two instances (i.e., index cards # 54 and 136) in which two of the three athletes perceived similar differences in the development and maintenance of their performance. Thus, the importance attributed to certain factors between the development and maintenance of performance was generally different across the three athletes.

2.2. Conceptual Maps

In the following section, each athlete's conceptual map is presented and summarized. The maps include the higher order categories that the athletes included and the sub-categories that they created. They also depict the relationships that were identified between the categories. The first summary pertains to C2's conceptual map.

2.2.1. Athlete C2

Athlete C2 included four higher order categories in her map, that is, Training, Competition, Personal Characteristics, and Context (see Figure 1). In terms of training, she created several sub-categories that encompassed motivational factors, general aspects involved in training, goal-setting, results, recovery, evaluation, testing, pre-competition training, as well as peripheral components such as off-season training, environmental conditions, and nutrition. It is noteworthy that mental training was perceived as the most important category.

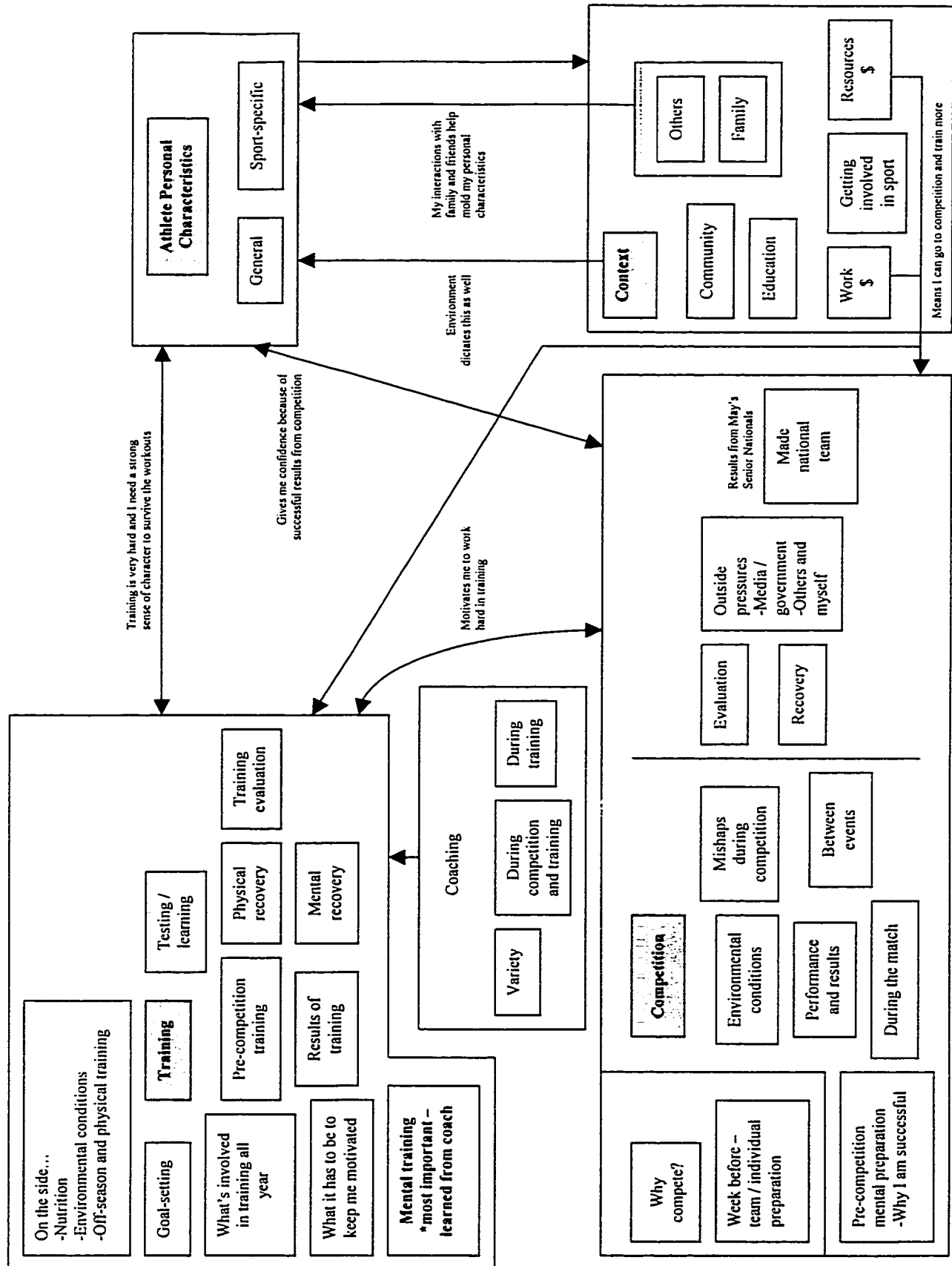


Figure 1. C2's conceptual map.

Training was related to competition, which was also subdivided into various categories including reasons for competing, pre-competition preparation, performance, results, environmental conditions, mishaps, evaluation, recovery, and external pressures. C2 indicated that mental preparation prior to competition is the reason why she was successful. She exemplified the link between training and competition by noting that competition motivated her to work hard in training. A sub-section was created between competition and training that involved factors related to coaching. As can be seen in Figure 1, coaching was directly related to training.

C2 only created two sub-categories under the higher order category “Personal Characteristics” that she termed “General” and “Sport-specific.” She related Personal Characteristics to Training and highlighted the fact that training is arduous and she needs a strong sense of character to survive the workouts. She also exemplified the link between Personal Characteristics and Competition by indicating that successful results in competition increase her confidence.

The higher order category “Personal Characteristics” was also related to the higher order category “Context,” under which C2 created sub-categories involving family, other individuals, community, education, work, early involvement in sport, and financial resources. She indicated that her interactions with family and friends helped to mold her personal characteristics. Moreover, she noted that her general environment influenced her personal attributes as well. Having a part-time job and financial resources from external sources allowed her to compete and invest more time into training.

In sum, C2 highlighted several important categories that pertained to her process of training and competing, as well as her context and personal characteristics. Coaching

was singled out and mental preparation was perceived to be extremely important in both training and competition.

2.2.2. Athlete C4

Athlete C4 included five broader conceptual categories in her map, that is, Context, Personal Characteristics, Training, Competition, and Organization (see Figure 2). It is interesting that she structured it differently than C2 in that she created a column for each higher order category, under which she organized her sub-categories. Note that the higher order category “Organization” was perceived as a peripheral component and was included at the bottom right of her map.

In terms of training, C4 created sub-categories that related to her development, indirect training, off-ice training, setbacks, distraction control, and recovery. Another category termed, “What training was to me / What it was about” included information that pertained to the nature of her training. As can be seen from the arrows in Figure 2, C4’s development was related to indirect training, which was in turn linked to off-ice training. Off-ice training was related to setbacks, which was also associated to an ability to control distractions. C4 denoted another relationship between setbacks and recovery. Two other categories pertaining to the nature of her training and factors such as tactical, technical, and mental training were also associated with recovery. C4 noted that environmental conditions in training were good throughout her career and that training camps and working with a fitness trainer were important to maintain her performance. Another observation was that her years of training led to an important training camp that involved centralizing with her team to prepare for the Olympics.

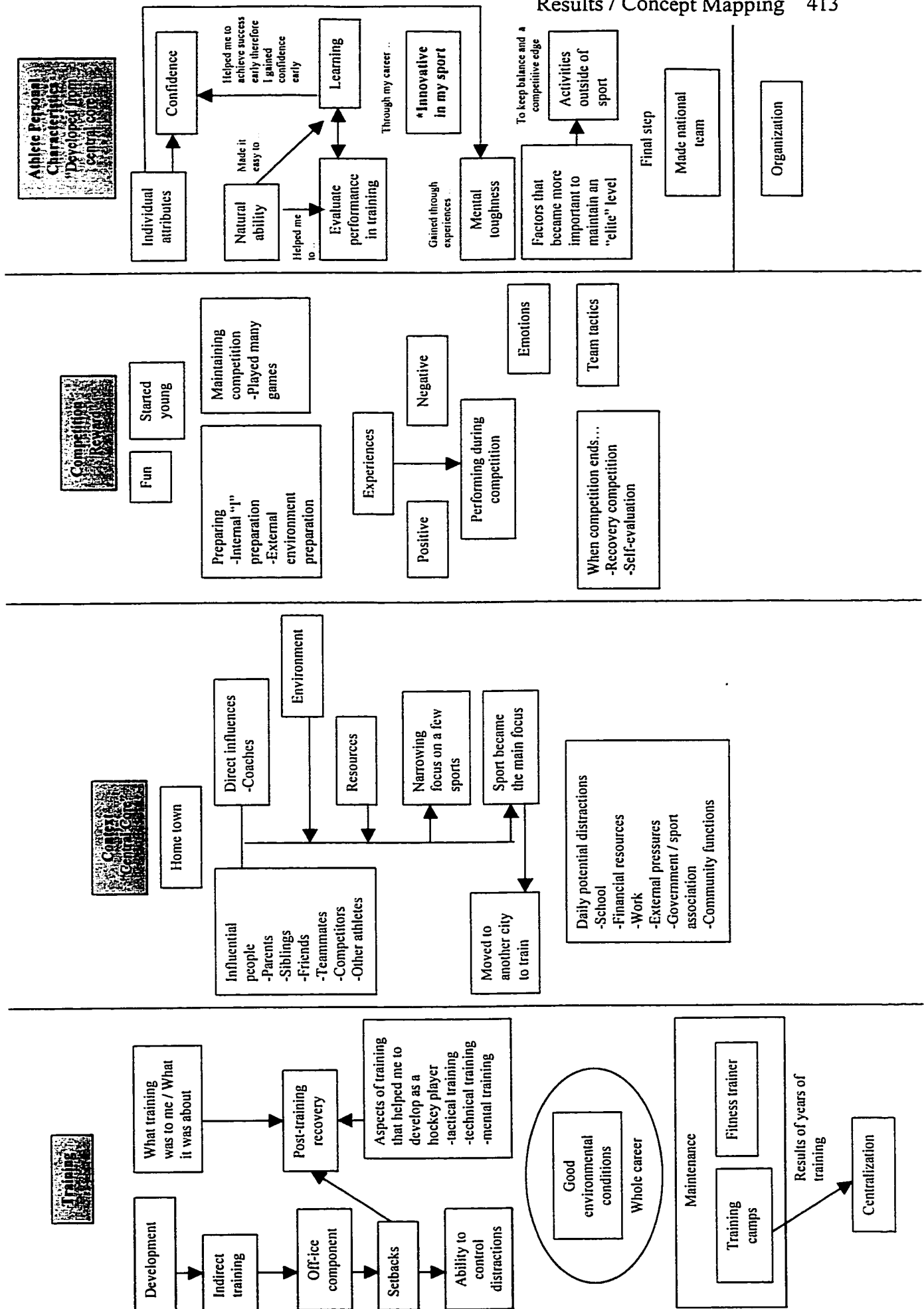


Figure 2. C4's conceptual map.

The higher order category “Context” was identified by C4 as the central core of her map. Sub-categories pertained to her hometown, resources, and her environment, and influential people such as parents, siblings, friends, teammates, competitors, other athletes, and coaches. These people and factors eventually influenced her decision to narrow her focus on a few sports, and to subsequently focus on one sport and move to another city to train.

C4 also created a sub-section within the higher order category Context to highlight daily potential distractions in her context such as school, financial resources, work, external pressures, government and sport associations, and community functions.

As far as competition is concerned, it was perceived as a reward and comprised sub-categories related to internal and external preparation, maintaining competition, positive and negative experiences, performance, emotions, team tactics, recovery, and evaluation. It is interesting that C4 created two sub-categories to highlight the fun aspect of competition and the fact that she started competing at a young age. A relationship was identified between the categories “Experiences” and “Performing during competition.”

C4 indicated that her personal characteristics developed from the central core, that is, her context, which included several influential people. She created several sub-categories under this higher order category that pertained to individual attributes, natural ability, evaluation, learning, confidence, mental toughness, activities outside of sport, and factors that were important to maintain an elite level. Her individual attributes were linked to mental toughness and confidence. She highlighted the fact that her natural ability helped her to evaluate her performance in training and also made it easy for her to learn. Her ability to learn helped her to achieve success early on in her career, which in

turn helped her to gain confidence at a young age. There was also a relationship between evaluation and learning.

C4 emphasized the importance of being innovative in her sport throughout her career. She also indicated that she developed mental toughness through experience. The factors important to maintain her performance at an elite level were linked to activities outside of her sport. The latter helped her to maintain some balance in her life as well as a competitive edge. A category that was perceived as a culmination step in her development was making the national team.

In sum, C4 identified several categories to highlight important aspects of her context, personal characteristics, training, and competition. Of interest is that her context was perceived as being central to her development, and competition was seen as a reward after engaging in intense training. C4 felt that remaining innovative in her sport was extremely important throughout her career. Finally, although organization was included as a higher order category, it was only a peripheral component in her conceptual map.

2.2.3. Athlete R3

The four higher order categories of Context, Training, Competition, and Personal Characteristics were included in R3's conceptual map (see Figure 3). The structure of his map was similar to that of C2 in that the higher order categories were displayed across the map and not in columns like in the map of C4.

Under the higher order category "Context," R3 created sub-categories that pertained to athletics, education, other athletes, as well as his family, friends, training context, and sport association. It is interesting that he created a sub-section to include information related to his home and family life. He also regrouped the sub-categories

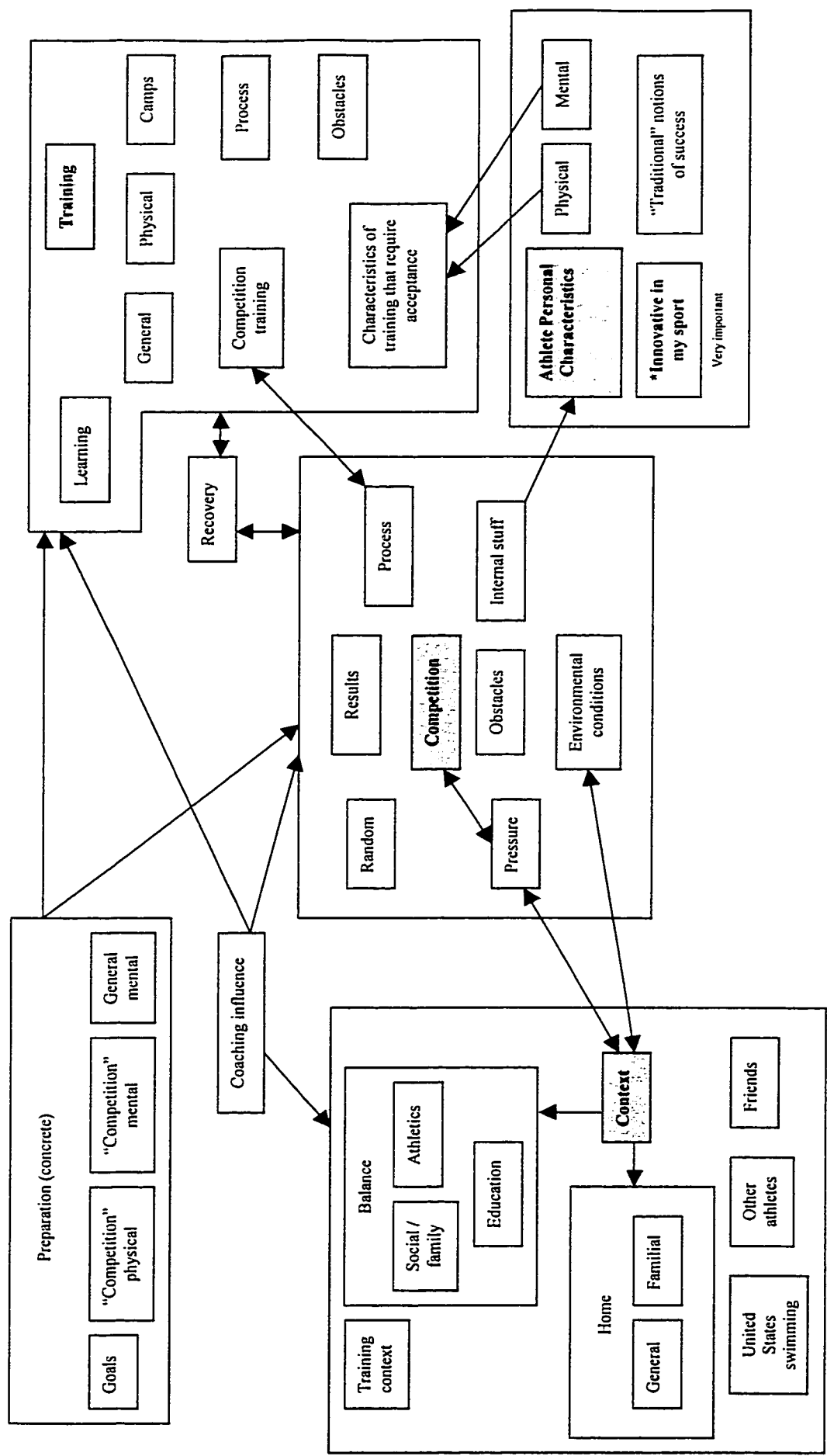


Figure 3. R3's conceptual map.

“Social / family,” “Athletics,” and “Education” under a sub-section that he entitled “Balance” to illustrate that these categories helped him to maintain some balance in his life.

R3 denoted a relationship between Context and Competition to show that his context influenced his environmental conditions and the pressure he felt at competitions. Other sub-categories created under Competition pertained to the process of performance, results, internal and random factors, and obstacles. A relationship was identified between Internal factors and Personal Characteristics.

It is noteworthy that R3 created a sub-section entitled “Preparation (concrete)” that encompassed information about his preparation for competitions. This sub-section was related to not only competition but also training. He also created a separate category to emphasize the influence that coaches had on his performance in competition and training, and on his context. Another separate category titled “Recovery” was also included and linked to both competition and training.

In terms of training, R3 created sub-categories that concerned learning, general and physical training, camps, the process of training, obstacles, competition training, and characteristics that required acceptance. Competition training was linked to the category “Process of performance” under Competition.

Under Personal Characteristics, R3 created two sub-categories that regrouped physical and mental attributes. These two categories were perceived to impact the category “Characteristics of training that required acceptance.” R3 also identified sub-categories entitled “Traditional notions of success” and “Innovative in my sport.” It is noteworthy that the latter was perceived to be extremely important.

In sum, R3 created several categories pertaining to his context, personal characteristics, training, and competition. Three categories regarding coaches, recovery, and preparing for competition were singled out. Also, being innovative in sport was accentuated and noted as being particularly important.

2.2.4. Summary of Three Conceptual Maps

Although the three maps were unique and organized somewhat differently, several common categories and relationships emerged. First, all three athletes chose to use the higher order categories of Context, Training, Competition, and Personal Characteristics in their maps. C4 also included Organization but it was not a major component.

In terms of the context, all three athletes identified categories that pertained to their family and other influential people such as friends and other athletes. Education and resources including sport associations were also depicted. C2 and C4 created categories regarding financial resources and the community. Furthermore, R3 and C4 highlighted the importance of their home and home town. While C4 categorized information related to coaches under the higher order category Context, C2 and R3 created separate categories in their maps to highlight their influence.

The categories pertaining to training varied between the athletes. C2 and C4 identified categories to account for off-ice or physical training, mental training, and environmental conditions. While C2 perceived the latter as a peripheral component, C4 noted it as a central one. C4 noted that mental training contributed to her development while C2 reported that it was the most important factor in her map. Both C2 and C4

categorized recovery from training under the higher order category Training, yet R3 included it as a separate category.

Other similar categories were created by C2 and R3 and involved learning and competition training. On the other hand, C4 and R3 identified categories concerning training camps and obstacles / setbacks. A unique category that was only found in R3's map concerned the process of training. Also, C2 was the only one to highlight goal-setting, nutrition, evaluation, results, and motivating factors. C4 created unique categories for distraction control and centralization. She also specified that training camps and working with a fitness trainer was important for maintaining her performance.

Common categories related to competition included performance, results, and preparation although R3 created a separate sub-section to highlight information pertaining to preparation. C2 and C4 included categories regarding evaluation and recovery, and R3 and C2 created categories to depict environmental conditions, obstacles, and pressure. C4 delineated several unique categories that concerned negative and positive experiences, emotions, team tactics, fun, frequency of games, and the age of onset of competition. Furthermore, C2 created a category to highlight the fact that she made the national team as a result of successful competitions. It is noteworthy that C4 did the same but included this category under Personal Characteristics. She believed that her strong personal characteristics led her to make the national team.

The categories included under Personal Characteristics also varied across the athletes. C4 created several categories to highlight individual attributes, in particular, her confidence, natural ability, mental toughness, and ability to learn and evaluate her performances. She also created a category to highlight the importance of being innovative

in her sport and maintaining balance in her life. She also regrouped factors that were important to maintain her performance under one particular category.

It is interesting that R3 also created a category in his map to note the importance of being innovative in his sport. Another category that was similar to that of C4 pertained to mental attributes. Two other categories that were unique in R3's map concerned physical attributes and what was termed "Traditional notions of success." As far as C2 is concerned, she only created two categories under Personal Characteristics that included general and sport-specific factors.

The athletes identified similar relationships between the categories in their maps. C2, C4 and R3 indicated a relationship between Training and Competition. C2 and R3 depicted relationships between Competition and Context, Competition and Personal Characteristics, as well as Training and Personal Characteristics. C2 and C4 created a link between Context and Personal Characteristics and finally, C2 associated Context with Training. Although C4 did not include arrows to show the relationships between the broader categories in her map, she made the observation that they were all interrelated. She did not draw arrows between these categories because her map would have been too cluttered.

In sum, the athletes' conceptual maps provided another interesting way to examine the data. They contributed additional pertinent information regarding the factors the athletes perceived as important in the development of their performance. Although each map contained unique categories and was organized in a particular fashion, several common categories and relationships existed across the maps. It is noteworthy that the information the athletes conceptualized in their maps complemented and confirmed the

data they verbally shared during their interviews. Now that the results of this study have been presented, the focus can be shifted to the discussion. The next chapter will center on the discussion of the results.

CHAPTER V

DISCUSSION

This chapter includes an interpretation of the results of this study. Due to the number of participants who were interviewed and the data that were collected through the concept mapping activity, the results were extensive. A wealth of data was included in the previous chapter to highlight both the similarities and differences in the development and maintenance of the athletes' performance. The discussion will focus on the main themes that emerged from the interviews and the concept mapping activity. Limitations of the study and recommendations for future research are presented at the end of the chapter.

Once again, the purpose of the study was to examine factors that were perceived to be important for the development and maintenance of the highest level of performance in sport. Ten athletes, nine parents, and four coaches were interviewed. Note that the data provided by one of the coaches was not included because the interview could not be transcribed. Furthermore, three of the ten athletes were involved in a concept mapping activity in which the factors they perceived important for the development and maintenance of their performance were conceptualized.

In order to provide some order in the discussion, the following headings will be used: Overview of Interviews, Sampling Years, Specializing Years, Investment Years, Maintenance Years, Recommendations, Concept Mapping, Limitations, and Future Research. An overview of the data elicited from the interviews will be the focus of the next section.

Overview of Interviews

Several factors deemed important for the development and maintenance of expert performance were raised by the participants during their interviews. It is interesting that some of these factors varied between the athletes and across their athletic career (see Table 8). An interesting finding is that the athletes progressed through various stages of development before they became World and Olympic champions in their sport. Their transition to a new stage was usually characterized by a significant event, such as changing clubs or teams, which often meant working with a new coach. Other markers included pursuing a higher level of education, moving to another city to train, making the national team, or winning a gold medal.

The line graphs found in Appendix J provide an overview of the evolution of the athletes' career and illustrate the stages of development through which they progressed and the age at which they made their transitions. As previously mentioned in the Results section, these stages were outlined based on the findings of Côté and Hay (in press) because there was a striking resemblance between the stages found in Côté and Hay's study and those that emerged in the current study. The Maintenance Years stage was added in this study to distinguish the period the athletes entered after winning a gold medal at the Olympics or World Championships.

As can be seen in Table 4 in the Results section, the number of years spent within each stage varied between the athletes. For example, one athlete spent nine years during the sampling years whereas another spent 21 years. The number of years the athletes remained within a stage also varied as they progressed through their career. On average, they spent most of their time during the sampling years, an average of 15.5 years. They

spent a similar amount of time in the subsequent stages, more specifically, an average of 3.9 years during the specializing years, 4.3 years during the investment years, and 3.1 years during the maintenance years.

This suggests that the athletes spent a remarkable amount of time practicing various sports and mastering basic fundamental skills before they actually started to specialize in one or two sports. They also appeared to have spent a similar amount of time concentrating on specializing in a few sports during the specializing years as they did focusing on one sport during the investment years. Of interest is that the athletes also spent a considerable amount of time maintaining their performance after they became World or Olympic champions. Within that time frame, they all won a second World or Olympic title. Some of them won up to five gold medals during their maintenance years. Based on their accomplishments, it can be concluded that they were exceptionally high caliber athletes.

The age at which the athletes entered a new stage also varied. The most striking differences were noted between the first and second stages. A few athletes were very young and started specializing in their sport at the age of 9, 10, or 11 while others started specializing in their mid-teens or early twenties. On average, the athletes started specializing at the age of 15. Côté and Hay (in press) found that the athletes in their study started specializing in their sport at about 13 years of age, thus at comparable ages.

The average age at which the athletes entered the investment years was 19.4. Some of them made this transition in their mid to late teens while for others, it was not until their mid-twenties. In Côté and Hay's (in press) study, the athletes entered this period at about 15, thus there was a difference of approximately four years between the

two studies. Côté and Hay did mention that the ages could vary depending on the sports they athletes practiced.

In terms of the maintenance years, the athletes entered this stage when they were approximately 24 years. All of the athletes, except one who was 17 years of age, were in their early to late twenties when they started maintaining their performance. Note that Côté and Hay (in press) did not include this higher level stage in their study thus no comparisons can be made for this stage.

The current results indicate that there was no set time frame for the athletes to progress in their sport. Some of them started young while others started late. This somehow contradicts Ericsson et al.'s (1993) notion that expert performers should start engaging in deliberate practice in their talent area very early on in life. The athletes did not provide any explanation for spending a particular amount of time during a stage. However, most athletes said that spending a lot of time playing different sports throughout their childhood was extremely valuable because it allowed them to develop a solid knowledge base and a repertoire of skills that were helpful in the sport in which they eventually succeeded. Therefore, all the years they spent playing and practicing various sports most likely contributed to the development of physical and mental skills they required at a higher level.

There were common events that influenced the athletes to advance to subsequent levels during their athletic career. The athletes entered the specializing years when they chose to narrow their focus on a few sports (Côté and Hay, in press). For many of the athletes in this study, this decision was influenced by a coach who encouraged them to pursue a particular sport because they noticed that they had talent or potential to succeed.

Some coaches also influenced the athletes to enter the investment years. At this point, many athletes made the national team and narrowed their focus on their sport of excellence. Côté and Hay also found that coaches often influenced the decisions of athletes to enter a new stage. As far as the maintenance years are concerned, the athletes entered this period after winning a gold medal at the Olympics or World Championships. For some athletes, it was a few years later because they either had setbacks after winning or they did not have enough experience at a high level to conclude that they were maintaining their performance.

Now that an overview of the athletes' progression through different stages was provided, the factors that were perceived to be important during each stage will be discussed. The factors that emerged from the analysis were categorized under the following general headings: Context, Personal Characteristics, Training, and Competition. These categories were partly based on the findings of Côté, Salmela, Trudel et al. (1995) who studied the factors affecting the knowledge of expert gymnastics coaches. Their findings led them to postulate a model in which the factors were classified under three central components (i.e., competition, organization, and training) and three peripheral components (i.e., coach's characteristics, gymnast's personal characteristics and level of development, and contextual factors, see Appendix B). It is noteworthy that the factors in the current study could also be classified under similar components, which lends empirical support to their model. A few significant differences were that the factors concerning coaching were categorized under Context in this study and Organization was not a major theme like it was in the research of Côté and colleagues. The factors perceived to be important during the sampling years will be discussed next.

Sampling Years

The athletes revealed that several factors influenced their development during the sampling years. As mentioned above, these factors pertained to their context, personal characteristics, training, and competition.

Context

The most important contextual factor appeared to be parental support. All of the athletes except R2 revealed that their family played a crucial role in their development. Most of the athletes' parents were athletic and encouraged them to participate in various sports including those in which they were personally involved. This finding was corroborated by the parents themselves.

The importance of parental support was highlighted by several researchers including Bloom (1985), Csikszentmihalyi and colleagues (1993), Carlson (1993), and Côté (1999). These authors found that the parents in their study provided their children with many opportunities to have fun and play various sports. They also made substantial sacrifices to attend events, help with organizational tasks, and to financially support their children. It was evident that some parents in the current study were more involved than others, however, the main finding was that they encouraged their children to participate in a variety of sports and supported the decisions they made as long as their children were enjoying themselves. It was clear that they did not push them to engage in any activity they did not want to pursue.

Many of them also mentioned that they were very distraught by other parents they knew who forced their children to train or compete in a particular sport and who put a lot of emphasis on winning. They were against this because they believed it was important to

support their children regardless of the outcome of their participation. This finding cannot be underestimated since it has been an increasing prevalent concern in our society that parents put too much pressure on their children to win, even when children are involved in youth sport programs geared toward having fun (Ewing, Seefeldt, & Brown, 1996).

Coaches were another important resource during the sampling years. According to both the athletes and parents, the coaches created a nurturing environment in which the athletes had fun, felt secure, and for the most part, experienced success. The importance of having fun during this period was reiterated by the participants on several occasions during their interview. The athletes noted that although the coaches helped them to develop a repertoire of skills, the most memorable aspect of their participation at that level was that they made it fun for them. This finding is extremely important and supports the recommendation of Ewing et al. (1996) that coaches should create a fun atmosphere for children who participate in youth sports in order to motivate them to remain involved. Similar findings regarding the important role of coaches during the early years of development were also discussed by B. S. Bloom (1985), Csikszentmihalyi and colleagues (1993), Carlson (1993), and Côté and Hay (in press).

The athletes in the current study usually started working with a coach when they were introduced to organized sports. On average, they began organized sports at the age of 7, thus they started at a fairly young age. Note that they participated in less formal and structured sports and games as early as two years of age. The fact that they were exposed to sports very early on most likely had an influence on the development of their skills. It is interesting that the parents were most often responsible for introducing their children to both less formal and more organized sports and games.

Carlson (1993) examined the development of 162 elite Swedish athletes and 164 younger talented athletes participating in seven different sports using questionnaires and supplementary interviews. Of these 326 athletes, 211 were men and 114 were women. An interesting finding in his study was that approximately one third of the male athletes and one sixth of the female athletes became members of a sports club before the age of 7. Carlson also observed that several of the athletes were involved in informal sport activities on a regular basis before they were introduced to organized sports. Both parents and friends influenced the athletes' initiation to organized sports. These findings resemble those generated in the current study.

In addition to parents and coaches, siblings also had an influence on the athletes who participated in this inquiry. Many of them were very involved in sports as well and were excellent role models for the athletes. The role of siblings in the development of expertise has not been extensively studied. However, Csikszentmihalyi and colleagues (1993) found that the participants in their study who perceived their family context as being both integrated and differentiated, that is, supportive, harmonious, yet challenging and free, reported having more flow experiences with siblings and a higher quality of experience at home.

Côté (1999), on the other hand, found that sometimes there was tension and jealousy among the siblings in his study due to the fact that parents paid more attention to the child who excelled or showed promise in a sport. This finding was not evident in the current study, however, one father admitted spending more time with his older daughter who eventually became a World champion because she was always motivated to learn and to improve her performance.

Friends were also perceived to have had an impact in the lives of the athletes particularly during their childhood. Many athletes reported that one of the reasons they participated in sports was to be with their friends. Although they befriended their teammates, they also had friends outside of sports. The parents confirmed that the athletes' friends played a significant role not only during the sampling years, but throughout their entire career. Carlson (1993) found in his study that friends made a significant impact in the lives of the athletes. They not only had an influence on their introduction to organized sports, they also stimulated their continuous involvement in subsequent years.

Csikszentmihalyi and colleagues (1993) found that the participants in their study had to make sacrifices and give up hanging out with their friends in order to focus on their talent area. The activities they did do with their friends were mainly educational in nature. A few athletes in the current study also mentioned that they had to sacrifice going out with friends. Empirical research on the role of friends in the development of expertise is sparse in the literature thus it should be the objective of future studies. The contribution that these individuals make in the lives of developing experts could then be further enhanced.

It is interesting that two of the ten athletes reported dropping out of a particular sport at one point during the sampling years. One athlete said that he was not enjoying himself anymore because there was too much focus on competition and too much pressure to succeed. Another athlete dropped out because it was getting too difficult and dangerous for her to play hockey with boys. They were too big and she did not want to risk getting injured.

The incidence of drop-out in sport during adolescence is a prevalent concern in our society (Csikszentmihalyi et al., 1993; Ewing et al., 1996; Weinberg & Gould, 1995). Many studies have been conducted to examine the factors that lead to dropping out. Weinberg and Gould (1995) found that too much emphasis on outcomes and performance and a lack of motivation and self-esteem were contributing factors. Results of this study show that although most of the athletes were not pressured to compete and to win during childhood, some of them did not always have the most favorable environmental conditions in which they could develop.

Personal Characteristics

The athletes felt that they possessed several physical and mental attributes that contributed to their development during the sampling years. They were highly motivated and had a strong work ethic. B. S. Bloom (1985) revealed that motivation is extremely important in the development of exceptional performance. He noted that although a child's motivation to learn may vary as he or she progresses through different stages in life, "a long-term commitment to the talent field and an increasing passion for the talent development are essential if the individual is to attain the highest levels of capability in the field" (p. 538). Csikszentmihalyi and colleagues (1993) also found that motivation significantly contributed to the achievement of expertise. In fact, they stated that children cannot develop their talent without motivation. They found in their study that both intrinsic and external rewards were essential, although intrinsic rewards were more important.

The parents also indicated that their children had a lot of determination and a strong desire to learn, work hard, and to do well when they were young. They believed

that they played a role in nurturing their children's passion and confidence and in helping them develop good working habits. This finding is in accordance with that of B. S. Bloom (1985) who found that the parents in his study "raised their children to believe in the importance of doing something well, to place work and duties before pleasure, to believe in the importance of hard work, and to strive for future goals" (p. 539).

Another personal characteristic deemed important was natural talent. It is interesting that eight of the ten athletes believed that they had innate abilities that contributed to their success in sport. Many of them knew they were special when they compared themselves to others in their age group. R3 was convinced that he had a technical gift to swim, particularly since he was competing against older athletes at a very young age. At age seven, he was already competing against children who were nine and ten years old. At nine years of age, he was competing at a national level, and at 12, he broke national records.

It is noteworthy that all of the parents and coaches who participated in this study also believed that the athletes had some natural ability that contributed to their development during their athletic career. Although the parents made an effort to raise their children in a similar fashion and to provide them with the same guidance and support, some of them noted differences between their children's interests, physical abilities, and personality very early on that could perhaps be explained by genetic differences.

Ericsson and colleagues (1993) and Howe and colleagues (1998) would probably challenge the participants' belief that natural ability contributed to the athletes' achievements. They advocated in the literature that innate abilities play a negligible role

in the development of expertise and that instead, deliberate practice is the most accountable factor in this process. The athletes did acknowledge the fact that practice was extremely important, however, they still perceived that they inherited certain skills (i.e., strength, coordination, body mass) that proved to be valuable in their development.

To some extent, these findings support those of C. Bouchard and colleagues (1997) who advocate that talent is partly innate. These authors found that several physical and physiological characteristics were genetically determined. They stated that most elite athletes possess a particular profile of physical and mental abilities that are partly influenced by heredity. However, they are still not certain of the true contribution of these abilities in the development of expert performance. Csikszentmihalyi (1998) argued that such abilities sometimes manifest themselves in an increased ability to learn and to adapt to the environment and it is interesting that some of the coaches and parents highlighted the fact that the athletes had a facility to learn and process information. Saudino (1997) found that personality traits such as impulsivity, aggression, depression, thrill-seeking, neuroticism, extraversion, and shyness were genetically determined and could potentially influence athletic ability. None of these personality traits were discussed by the participants except perhaps the trait of thrill-seeking. Many athletes discussed the fact that they took risks throughout their career. Furthermore, they enjoyed variety and change and they especially liked to be challenged.

Training

Several factors pertaining to training were also important in the development of the athletes' performance during the sampling years. The athletes were initiated to practice and they were committed to developing various skills. Ericsson and colleagues

(1993) emphasized the importance of initiating deliberate practice at a young age. They postulated that the level of expertise attained in a domain is monotonically related to the accumulated amount of hours of deliberate practice. Although the athletes in the current study spent extensive periods of time playing different sports and developing various skills during the sampling years, it is not clear to which extent the type of training they did at this level could in fact be considered deliberate practice.

The athletes reported training between 0.5 to 8.5 hours per week during the sampling years but these figures would have been higher had the athletes calculated the hours they spent practicing in all the sports in which they engaged. They mentioned that at that age, the emphasis was on having fun and that the training they did was not particularly structured. The type of training they did conformed more to what Côté and Hay (in press) termed “deliberate play.” In other words, they were more concerned with playing to have fun than playing with the specific and conscious intention of improving certain aspects of their performance. It is obvious that they did improve because most athletes reported experiencing success in sports very early on, however, it appears that their activities were more geared toward deliberate play.

Ericsson and colleagues (1993) advocated the importance of engaging in extensive hours of deliberate practice as early as possible, yet the results of this study and that of Côté and Hay (in press) indicate that deliberate play seems to be more predominant than deliberate practice during childhood. One question that should be answered in future research is, “To what extent does deliberate play contribute to the development of expert performance?” Results of such research would help coaches to

optimize the type of play activities required for optimal performance at different stages of development.

The notion that individuals must engage in 10,000 hours or 10 years of deliberate practice in a domain before becoming an expert (Ericsson et al., 1993) also merits discussion. Consider the case of R2 who participated in a variety of sports throughout his childhood and adolescence and was not introduced to bobsleigh until he was 21 years old. He did not deliberately start to train in this sport until that age. However, he started gymnastics at the age of five and competed in many track events until his teenage years. This athlete who was Olympic and World Champion several times even dropped out of sports for a few years when he was teenager.

R2 switched positions in bobsleigh at the age of 24 to become the driver of his sled after being a runner for three years. At this point, he had to learn many new skills, particularly since he was now the leader of his team. It is impressive that he won his first gold medal four years after that. In sum, he trained approximately seven years in his sport of excellence before he actually became an “expert” and won a gold medal. This does not conform to Ericsson et al.’s (1993) findings that an individual has to invest 10 years of deliberate practice before reaching expert status. Perhaps R2 was an exception to the rule however the current findings suggest that the framework of Ericsson and colleagues should be further tested across different sport disciplines in order to determine its generalizability to the sport domain.

Ericsson et al. (1993) also stated that the development of expertise is domain specific, thus the skills developed in a particular domain are not transferable to another, yet several athletes in this study mentioned that they benefited from learning various

skills in other sports. These scholars conducted most of their studies with musicians thus perhaps skills are less transferable in that domain than in sports.

Ericsson et al. (1993) also reported that the years of experience in a domain are necessary but not sufficient to achieve expertise. R2 accumulated three years of knowledge, training, and experience as a runner before he actually became a driver and these years of experience significantly contributed to his subsequent success as a driver. These results suggest that it might be important to consider the experience that athletes accumulate and the number of hours they train in various sports when attempting to determine the contribution of practice required to become an expert in this domain.

Competition

Several factors related to competition during the sampling years were raised by the athletes. For one, the athletes began competing in their sport of excellence at different ages. For example, R3 started competitive swimming at age five but the main emphasis was on having fun. C4, C6, and R4 started playing in hockey tournaments at approximately age seven. Both C1 and R1 were introduced to their sport of excellence at the age of 10 and subsequently started competing in those sports. C5 only started racing when he was 15 although he began skiing for fun at the age of seven.

Many researchers, parents, coaches, and sport administrators have questioned the age at which children should be initiated to competition (Ewing et al., 1996; Gould & Weinberg, 1995). The results of this study suggest that regardless of the age at which the athletes began competition, they still managed to become the best in their sport. The three hockey players, however, mentioned that they did benefit from playing many games when they were young. C3 also acknowledged the opportunities he had to attend several

meets at a young age, even though the main goal was to have fun. Of importance is that C3's father revealed that his son and teammates were not put under any pressure to win at that age. For the most part, competition was something that the athletes enjoyed because it was an opportunity for them to travel and to socialize with friends.

In sum, the sampling years consisted of a period in which the athletes were encouraged to engage in deliberate play, that is, to play various sports with the intention of having fun. Some of them had the opportunity to start training and competing in the sport in which they eventually excelled, however, their parents and coaches ensured that the priority remained to enjoy themselves. This most likely explains why the athletes stayed involved in sports during the sampling years and did not abandon sports like many children and adolescents often do (Weinberg & Gould, 1995).

Specializing Years

The athletes entered the specializing years when they decided to narrow their focus on a few sports (Côté & Hay, in press). Once again the factors that were important at this stage will be discussed in terms of the context, personal characteristics, training, and competition.

Context

Parental support was still a significant factor during the specializing years. Most athletes revealed that their parents continued to be encouraging and resourceful. They invested a considerable amount of time driving their children to practices and attending their events. Several parents continued to get involved in organizational tasks to help out. These findings are similar to those of B. S. Bloom (1985) who indicated that during the middle years, parents provided both moral and financial support to sustain their

children's involvement in sport. Once again, the athletes mentioned that their parents did not push them in any way to pursue an activity they did not enjoy. The importance of giving children the freedom to express themselves in the activities of their choice was highlighted by Csikszentmihalyi and colleagues (1993).

Côté (1999) also noted that the parents in his study continued to develop an interest in their children's sport and got involved at various levels during the specializing years. Some of them preferred to be cheerleaders in the stands while others played a more direct role and coached their children. It is interesting that three fathers coached the athletes in the current study. Two of them coached their daughters during the sampling years and another father coached his son until the end of the specializing years. All three athletes mentioned that they felt fortunate to have been coached by their father because they were very competent and knowledgeable in the sport. One father found it challenging to play the dual role of father and coach particularly during the sampling years when his son was younger. More research should be conducted to further examine the impact that parents who coach their children can have on the development of expert performance.

At this level, most of the athletes' coaches were supportive and provided a more structured environment for developing skills and technique. These findings corroborate those of B. S. Bloom (1985) and Côté and Hay (in press). Two athletes who were introduced to their sport of excellence at this stage mentioned that a coach noticed their potential to succeed. Three other athletes revealed that a coach detected their potential even earlier than this during the sampling years.

The phenomenon of talent detection in sport has been widely cited in the literature (Durand-Bush & Salmela, in press). While there is evidence to substantiate the ability of coaches to detect special characteristics and attitudes of future champions at an early stage (Thomas & Thomas, 1999), several researchers questioned the accuracy and usefulness of talent detection and prediction (Bartmus et al., 1987). Carlson (1993) found in his study that it was not possible to fully predict who would become top level players based on performance and skills during the early teenage years. Bartmus et al. also reported that it is very difficult to predict talent in sport. They advocated that talent detection is discriminating because children who do not show promise at an early age are sometimes denied the support and resources to which they are entitled to fully develop their potential in a sport. From a pedagogical perspective, it could be surmised that the Pygmalion effect discussed in the literature (Horn & Cox, 1993) could inhibit the performance of children in cases where coaches only choose to believe in and challenge those who show talent or promise at an early age.

One of the athletes in the current study did not show promise at an early age. Both C3 and his father revealed that he was a late maturer and he did not experience success until junior high school. C3 was tempted to give up running on many occasions, however, he enjoyed himself thus his father always encouraged him to continue. His father indicated that had he advised him to give up, he would have never become a World and Olympic champion in his sport. This is an example of a remarkable father who believed in his son and motivated him to persevere in his sport even though he was not talented and successful when he was young. As his father and coach, he did not put pressure on him. Instead, he emphasized fun in training and competition.

Other factors that came into play at this stage of the athletes' career pertained to the nature of the environment in which they practiced their sport. Once again, the athletes reiterated the fact that they thoroughly enjoyed themselves. It was interesting how their enjoyment was often discussed in relation to their success. This finding is similar to that of Scanlan and colleagues (1989) who found that one of the figure skaters' sources of enjoyment in their study was perceived competence. They also indicated that other sources of enjoyment included social and life opportunities, the act of skating, and social recognition of competence. The athletes in the current study also mentioned that socializing with teammates and friends and the act of performing sport skills (e.g., taking slapshots) were sources of enjoyment. They did not, however, discuss social recognition of competence and this was not surprising because they were very humble during their interview. One father did reveal that social recognition increased his daughter's self-confidence and desire to pursue her sport at a higher level.

Personal Characteristics

Other factors that contributed to the athletes' development at this stage concerned their personal characteristics. The most important finding was that the athletes were confident and believed that they had potential to succeed in their sport. Their confidence led them to take the necessary risks to improve their performance. Self-confidence has been found to be one of the most significantly discriminating mental skills between successful and unsuccessful athletes (Bota, 1993; Durand-Bush et al. (in press); Mahoney et al., 1987; Orlick & Partington, 1988). In fact, Orlick (1996) stated that it is one of the most important psychological variables associated with elite performance.

It is noteworthy that the athletes manifested self-confidence early on in their athletic career. Many of them attributed this to the fact that their parents and coaches also believed in them. Research has shown that coaches who believe in their athletes can positively influence their performance and lead them to actualize desired expectations (Horn & Cox, 1993; Sinclair & Vealey, 1989). This phenomenon known as the “Pygmalion effect” appeared to be instrumental in some cases even though it was suggested earlier that it can be detrimental in certain instances. R1 noted that at one point during the specializing years, one of her coaches told her that she did not believe she could become the best in her sport and this really traumatized her. She decided that she could no longer work with this coach because she did not share her beliefs and goals. The next coach she had was extraordinary because fundamentally, she believed in her potential to succeed. R1 trusted her and accepted all of the challenges she gave her to stretch her limits in her sport. This coach also confirmed during her interview that the first and most important thing to nurture in athletes is belief. She did however state that it is improper to mislead athletes if they clearly demonstrate a lack of ability to succeed at a certain level in their sport. The coaches in Salmela’s (1996) study also discussed the importance of believing in their athletes.

Training

Training at this level was much more focused and arduous than in the sampling years. It included physical, mental, technical, and tactical components, although technical training appeared to be more predominant. The athletes spent between 6 and 24 hours per week training sport-specific skills and in addition to this, they spent approximately three to seven hours doing other dry-land activities such as lifting weights and doing sit-ups

and push-ups. Consequently, the total number of hours they trained at this stage was substantially more than the hours they trained during the sampling years, at least for most athletes.

The athletes performed various activities with the intention of improving performance and a few of them mentioned that they experienced the most dramatic part of their learning curve in their career during this period. It was clear that they engaged in what Ericsson and colleagues (1993) termed “deliberate practice.” Although training was more effortful, it still appeared to be enjoyable. One athlete indicated that she enjoyed both the process and results of training. Ericsson et al. argued that deliberate practice is not inherently enjoyable however this did not appear to be the case for some athletes in this study. Some of them clearly demonstrated that they enjoyed the exertion of training. Young and Salmela (in press), Starkes et al. (1996), and Watanabe (2000) also found in their studies with athletes of various competitive levels that effortful training activities were enjoyable. This suggests that the dimension of enjoyment in Ericsson et al.’s (1993) framework should be reconsidered to fully account for the reality of training in sports.

All of the athletes mentioned that they still practiced a few other sports they enjoyed during the specializing years just to keep some variety in their schedule and to stay motivated. This appears to suggest that they still felt the need to engage in deliberate play. Côté and Hay (in press) emphasized the importance of balancing deliberate play with deliberate practice during the specializing years in order to sustain the athletes’ motivation and prevent them from dropping out of sport.

Competition

Competition was more prevalent during the specializing years than in the sampling years. The athletes discussed various events they attended and personal performance outcomes. It was evident that they experienced both success and failure at this level. It is interesting that a few athletes also mentioned that they felt pressure during competitions. They attributed this to the fact that they were inexperienced or they felt that they had to do well in order to keep their spot on the team. Bloom (1985) also found that the middle years provided the participants in his study with several opportunities to evaluate their performance during competitions. It is not exactly clear how much emphasis was put on the outcome of competitions at this level, however, one athlete in the current study temporarily dropped out of her sport during this period because she felt too much pressure and she was no longer having fun. This emphasizes Côté and Hay's (in press) suggestion that there should be a balance between work and play. It also suggests that the athletes should perhaps be encouraged to focus more on the process than the outcome of their performance early on during their career so that they can learn to appreciate and enjoy a certain quality in their performance even if they do not always succeed.

Investment Years

The athletes reached the investment years when they chose to invest most of their time and energy into one sport. Many athletes made this transition when they realized that they had potential to become one of the best in their sport as a result of making the national team or receiving a scholarship to pursue their sport at a high-level.

Context

The context in which the athletes were immersed during the investment years generally influenced them in positive ways. Several resources including family members, coaches, support staff, and other athletes were important to them. The athletes' parents were still as supportive as during the previous years however they were not as actively involved at this level. Many of their responsibilities decreased because the athletes were not around as much anymore. Most of them moved to another city to train or to go to school. Furthermore, most parents did not have to provide financial support like they had to during the sampling and specializing years because the athletes now had scholarships or were partly funded by their national team programs. These findings are in accordance with those of Bloom (1985) and Côté (1999). Côté found that the parents in his study helped their children to effectively deal with setbacks at this stage and some parents in the current study mentioned this as well. Once again, their children turned to them for advice and emotional support because they knew that they believed in them.

Education was another important factor not only during the investment years but also throughout the athletes' career. All of the athletes pursued post-secondary studies except C5. Most of them were high achievers in both sport and school and this was partly due to the fact that their parents always made school a priority throughout their lives. Csikszentmihalyi and colleagues (1993) found that school was a valuable resource for talent development because in many cases, individuals had access to excellent teachers and coaches who created positive environments in which they could develop skills and experience flow. The athletes in the current study did not discuss if they had flow experiences in school, however, several of them indicated that they enjoyed school. It

gave them the opportunity to develop a variety of skills and also to maintain some balance in their lives. The results of this study suggest that school and sport can complement each other very well and be pursued at a high level if the athletes effectively manage their time. Considering that the athletes in the current study attached so much importance to getting an education, the extent to which this contributes to their overall development in sport should be further investigated in the future.

Personal Characteristics

The main personal characteristics manifested by the athletes at this stage of their career once again pertained to self-confidence and motivation. During the investment years, the athletes were confident about their abilities to reach a very high level in their sport and they were motivated to train in order to achieve their ultimate goals. The parents also reiterated the fact that their children were determined and confident. Some of them noted that their children's positive attitude, desire to learn and perfect skills, and ability to focus and accept challenges were also important attributes in their development. Once again, these findings confirm that self-confidence and motivation significantly contribute to the development of expertise in sport (Bota, 1993; Durand-Bush et al., in press; Orlick & Partington, 1988; Starkes et al., 1996).

Training

The athletes' training activities during the investment years included physical, mental, technical, and tactical training. Compared to the other stages, practice sessions were much more intense and regimented and the athletes invested a remarkable number of hours into perfecting their skills. On average, they practiced between 15 and 40 hours per week and they also spent between one to seven hours lifting weights or doing other

dry-land activities. Consequently, they trained significantly more hours during this period than during the sampling and specializing years. In fact, training basically became a full-time job at this level, although some athletes still went to school or worked part-time.

The athletes made a conscious effort to perform their training activities with high quality and this type of deliberate practice led them to enhance detailed aspects of their performance. This confirms Ericsson et al.'s (1993) findings that individuals must engage in extensive hours of deliberate practice to improve in their sport. Many athletes revealed that the activities most important to perfect their skills at this stage concerned technical or tactical training, or both. Furthermore, in order to improve at this level, they had to work on a variety of details over and over again. Sometimes they got bored from doing the same routine, thus they had to overcome motivational constraints. Ericsson et al. reported that this is often a challenge as individuals progress toward higher levels of expertise in a domain. This emphasizes the importance of being intrinsically motivated and committed to persevere in a talent domain (Csikszentmihalyi et al., 1993; Orlick, 1996).

It is interesting that the athletes enjoyed more deliberate practice activities that involved refining technique and tactics at this level than dry-land activities. They did not always enjoy the process of lifting weights or running on the treadmill for example. They did however enjoy the outcome of this process, that is, improved strength and performance. This suggests that some deliberate practice activities were more enjoyable than others as the athletes progressed to higher levels in their sport. Of importance is that they still performed them with high quality even if they were not as enjoyable because they knew that their efforts would eventually pay off.

Mental training appeared to be quite important during the investment years.

Although the athletes began to develop their mental skills during the previous stages, they made a more conscious effort to improve them at this level. It is noteworthy that mental training did not always involve formal and structured sessions. Most of the time, the athletes refined psychological skills and strategies during daily activities and in conjunction with other training exercises. Many athletes reported that they thought a lot about their sport in an attempt to figure out ways to maximize their performance during training and competitions, and that this in itself contributed to the development of their performance. This is an interesting finding because some practitioners in the field of sport psychology assume that mental training has to be structured and involve the use of specific performance enhancement techniques in order to be effective.

Nonetheless, aside from benefiting from being cognitively engaged, many athletes reported using visualization and self-talk mainly to prepare for competitions and to remain focused during competitions. The positive effects of visualization have been widely cited in the literature (Mahoney et al., 1987; Murphy & Jowdy, 1993; Orlick & Partington, 1988; Vealey & Greenleaf, 1998). Murphy and Jowdy found that imagery can facilitate skill acquisition and maintenance. Moreover, it can help athletes increase their self-awareness and confidence, regulate their arousal, emotions, and pain, and enhance their competition planning strategies. Several athletes in the current study indicated that engaging in mental imagery did in fact make them feel more confident and prepared for competitions.

Self-talk is another technique that has been found to enhance athletic performance (Landin & Hebert, 1999; B. Rushall, Hall, Roux, Sasseville, & A. Rushall, 1988; Van

Raalte, Brewer, Lewis, Linder, Wildman, & Kozimor, 1995). Rushall and colleagues postulated that athletes can use three types of self-talk to maximize their performance. Task-relevant statements can be used to improve technique or specific skills. On the other hand, positive self-talk statements can increase motivation and perseverance. Finally, mood words such as “Go, push, quick,” can be useful to focus attention or to become more emotionally engaged in one’s performance. All three types of self-talk appeared to have been used by the athletes in the current study.

Setting goals was another strategy frequently used by the athletes at this level and also in previous stages as well. Both long and short-term goals guided their pursuits as they progressed in their sport. Many researchers including Burton (1993), Locke and Latham (1985) and Orlick and Partington (1988) have demonstrated the importance of goal-setting in sport and other settings. Orlick and Partington found that goal-setting was one of the elements that distinguished successful from unsuccessful athletes. Bota (1993) also found that goal-setting was one of the most significantly discriminating variables between elite and non-elite athletes. These findings suggest that it is an important skill to perfect to consistently perform at a high-level in sport.

The results of this study concerning mental training have several implications for sport psychologists who work with athletes to help them improve their performance. The use of more traditional mental training skills and strategies appears to be important, however, it seems that less informal processes such as self-reflection and evaluation should also be encouraged prior to, during, and after training and competitions. Linking mental training with other training activities appears to be another valuable suggestion to make to athletes.

Many athletes and coaches in this study revealed that they worked with other support staff members such as strength training coaches, exercise physiologists, sport psychologists, nutritionists, physiotherapists, and massage therapists, particularly during the investment and maintenance years. These individuals were extremely valuable resources because they provided information in areas in which the coaches were not necessarily the most knowledgeable. Very little research has been conducted on the role of support staff members in the development of elite athletes. Salmela (1996) found in his study with expert coaches that these individuals provided invaluable services and were important team members. The coaches reported that they worked with assistants who were competent, hardworking, compatible with other team members, and could be trusted. They had to have high standards, particularly at an elite level, and they had to contribute to the creation of an environment conducive to high quality training. It is interesting that one athlete in the current study highlighted the fact that it was important for her to develop a good relationship with her strength training coach and to trust the program he designed for her. Researchers should further examine the contribution of support staff members in the development of expert performance and determine if and how they can enhance the overall quality of experience of both the athletes and coaches.

In sum, training during the investment years was significantly more demanding and structured, and involved considerably more hours than in the previous stages. The athletes engaged in not only their regular physical, technical, mental, and tactical training activities but also in extra activities deemed important to refine specific aspects of their performance. Training was also done with a higher level of awareness and quality.

Competition

Competition during the investment years was extremely important and meaningful because it gave the athletes the opportunity to apply the skills and competencies they developed in training, and to evaluate their progress and success. One significant finding is that the athletes invested a considerable amount of time preparing for competitions at this level. Once again, they engaged in imagery and self-talk to optimally prepare themselves for their events. It is interesting that many of them adopted a particular mindset that allowed them to stay calm and focused on the tasks they needed to perform and to minimize the stress and pressure associated with high profile events like the Olympics or World Championships. Even though they were getting ready for the biggest performance of their lives, they made an effort to keep things into perspective. This strategy has been strongly advocated by researchers in the field of sport psychology (Botterill, Patrick, & Sawatzky, 1996; Orlick, 1998).

Some athletes reported that they tried to stay relaxed before a competition. They did not necessarily engage in structured or systematic forms of relaxation. They rather remained calm by keeping to themselves and by limiting their interactions with others in their environment. Relaxation is an excellent strategy that has been shown to be effective to regulate arousal and achieve ideal performance states (Williams & Harris, 1998). Once again, it is interesting that the athletes mentioned using less formal rather than more traditional relaxation techniques to optimally prepare themselves for competition.

The coaches in the current study reported that they helped their athletes develop competition plans. In some cases, these involved the use of imagery, relaxation, and other performance enhancement strategies. Competition planning has been shown to be a

valuable skill in the achievement of exceptional performance. Orlick and Partington (1988) found that successful athletes developed elaborate competition plans that helped them to focus and refocus before and during events, and to evaluate their performances after event. Gould et al. (1992) found similar results in their study with Olympic wrestling champions. The athletes in the current study revealed that post-competition evaluation was extremely important, particularly during the investment and maintenance years. Many of them spent considerable time assessing their performance after events and drawing lessons to improve their performance in subsequent practices and competitions.

Recovery was another significant theme at this level. The athletes discussed some of the strategies they used to allow themselves to recover mentally and physically from competitions and from the intense training they did before their events. These included relaxing, taking naps, and engaging in activities outside of their sport. According to many researchers, the importance of recovery cannot be underestimated. Ericsson and colleagues (1993) noted that because deliberate practice activities are mentally and physically effortful, they should be balanced with adequate recovery periods in order to prevent exhaustion or burnout. Morgan et al. (1987) revealed that athletes who do not allow their bodies to recuperate are at risk of being overtrained and experiencing both psychological and physiological disturbances that could seriously affect their performance. It is interesting that several athletes in the current study wished they would have had more time to rest during the investment and maintenance years. One athlete even mentioned that she was overtrained at a certain point in her career. These findings have important implications for coaches who have the responsibility of closely monitoring the athletes' training and performances. Levin (1991) reported that coaches

should ask their athletes to share how they physically and mentally feel throughout their training season in order to detect any signs of exhaustion or overtraining.

In sum, competition during the investment years was highly demanding and challenging but it was also very rewarding. The athletes engaged in extensive physical and mental preparation, which enabled them to be confident and focused to perform at the Olympics or World Championships. Incorporating adequate recovery periods into their schedule was another important factor that contributed to the development and quality of their performance.

Maintenance Years

The athletes moved into the maintenance years once they reached the pinnacle of their sport, that is, after they won a gold medal at the Olympics or World Championships. Although some factors were similar to those discussed in the previous stages, the athletes reported unique ones that were particularly significant at this level.

Context

Similar to the investment years, the athletes had access to several human and physical resources at this stage that helped them overcome motivational and effort constraints. They worked with excellent coaches who assisted them in refining skills in training and developing optimal strategies for competitions. In most cases, the athletes' coaches were extremely knowledgeable and well-respected. It is interesting that one athlete mentioned that she held her coach in such a high regard that she was sometimes even afraid of her. This fear element that emerged at a higher level was also noted by B. S. Bloom (1985).

Several athletes in the current study revealed that they appreciated the fact that their coaches paid attention to their needs and adapted their communication strategies to suit their style of learning. Coaches who were most effective and highly regarded were those with whom the athletes connected and developed a good relationship based on trust and respect. Csikszentmihalyi et al. (1993) also found that the most memorable teachers in their study were those who were able to perceive the participants' needs and interests, gave them the freedom to make choices and to be creative, and provided a secure environment for extending their skills. Similarly, Salmela (1996) found that the expert coaches in his study created a nurturing environment in which their athletes could express themselves, feel confident, and perform skills with a high degree of quality and satisfaction.

All three coaches in this study highlighted the importance of communicating well with their athletes and giving them opportunities to share their input and be part of the decision-making processes. They stimulated their critical thinking by asking them many questions and involved them in solving problems. It was clear that they adopted a more constructivist approach in their coaching (Glaserfeld, 1985; King, 1993). This approach has been strongly advocated by researchers in the domain of education (Laroche & Bednarz, 1994).

Other influential people during the maintenance years were the athletes' families. Again, family members were not as actively involved as during the sampling and specializing years, however, they continued to offer unconditional love and support as the athletes experienced both success and failure. They never stopped believing in the athletes and their ability to succeed. These findings are similar to those of B. S. Bloom

(1985) and Côté (1999) who reported that parents supported their children and did not play as much of a direct role in later stages of perfection.

Most athletes continued to learn from other people such as sport psychologists, exercise physiologists, the scientific community, teammates, and athletes from different sports. Once again, their desire to learn and improve was remarkable. Although they had reached the top of their sport, they still strived to enhance their performance. Some of the athletes attended university during the maintenance years, however, they generally took a leave of absence prior to the Olympics to invest all of their time and energy into preparing for these events. This raises the important issue of setting priorities, making sacrifices, and giving up some balance for a certain period of time.

Orlick (1996) and Ericsson et al. (1993) noted that there are certain periods when expert performers must completely commit and focus themselves on their talent area in order to succeed and this was the case for several athletes in the current study. Although they generally tried to maintain a sense of balance in their lives by engaging in activities outside of their sport, working on a part-time basis or going to school, they gave up these activities when they had to prepare for the Olympics. Amirault and Orlick (1999) conducted a study with 10 elite athletes to examine their perceptions of balance and they found that it fluctuated in cycles throughout their lives based on their needs and desires. All of the athletes reported being seasonally unbalanced at some points during their career. Nonetheless, they made a conscious effort to maintain balance when it was realistic for them to do so. Factors that helped them to attain some balance included (a) making a conscious decision to have balance, (b) having strong self-discipline, (c) enjoying what they were doing, (d) having a support network, (e) having leisure time, and

(f) being in the moment. Many athletes discussed these factors in the current study.

Making the conscious decision to have balance and being in the moment were particularly important during the investment and maintenance years whereas the remaining factors appeared to be significant at all stages of their career.

Personal Characteristics

Personal characteristics that were notable during the maintenance years again included self-confidence and motivation. These attributes appeared to have had an impact at all levels of the athletes' development. It is interesting that the strengths and qualities most cited by the athletes' parents were also confidence and determination.

A particularly significant factor that also emerged at this stage was the need to be creative and innovative. Some athletes discussed the importance of developing new strategies and skills in training and competition in order to keep an edge over their competitors. As World and Olympics champions, they noticed that they were being observed and copied thus they had to innovate in order to be able to maintain their positions. In a way, this was motivating for them, however, it also created pressure because they knew that if they did not stay ahead of their competitors, they could be defeated in future competitions. The importance of being creative and innovative was highlighted by both Csikszentmihalyi et al. (1993) and Partington (1995). The talented performers in their studies revealed that creativity was an essential element of performance that often led to flow experiences. The results of this study suggest that the athletes were creative individuals however it is not clear if their creativity was associated with flow. Future research should examine the role of creativity and innovation in the

development and maintenance of expert performance, and their potential contribution to flow experiences.

Another characteristic that was most likely related to the athletes' need to be creative and innovative was their desire to continuously learn and improve. This characteristic was evident not only during the maintenance years but in previous stages as well. Even if they were the best in the world, they all felt that they could continue improving their performance. It was interesting that one way the athletes monitored their performance and identified areas that could be enhanced was by keeping a journal. Journals or logbooks have been used by children, adolescents, and adults in sport have been shown to be effective tools to regulate performance and develop positive perspectives (Orlick, 1986).

The athletes were also very independent at this level compared to previous stages. Their need to share feedback and make their own decisions emerged during the investment years, however, it was even more predominant at this level. All three coaches revealed that they gave the athletes the opportunity to have more direction. One of them said that he was there to guide C1 and answer her questions but ultimately, she was responsible for the course of her learning at this stage. Salmela (1996) found that the coaches in his study encouraged the athletes to become more independent and self-directed as they progressed toward higher levels in their sport. Bloom (1985) also found this to be the case when the performers in his study entered the later years of talent perfection. Singer and Janelle (1999) stated that the more individuals are actively involved in their learning process and take responsibility for their own actions, the more persistent and satisfied they will be. This once again demonstrates the importance of

coaches to give their athletes opportunities to assume control of their development and to initiate this self-directed process early on in their career so that they can remain confident as they make transitions to higher and more demanding stages.

Training

Like in the investment years, the athletes sacrificed many personal and extracurricular activities to concentrate on training at this level. Once again, physical, technical, mental, and tactical training were integral components of their routine. The athletes were asked what they needed to do to maintain their performance at this stage of their career and although their responses varied, some common factors emerged. Many of them said that they had to get adequate rest because their training was intense and involved extensive hours, just like in the investment years. Note that two athletes took a break at one point during the maintenance years to give themselves the chance to mentally and physically recover from their previous years of intense training and competitions. It would be interesting to further investigate the incidence and effect of reducing training during the maintenance years because several athletes felt that they did not necessarily have to train as much at this level. In fact, they wished they would have had more rest periods. Once again, this confirms the findings in the literature that recovery is an extremely important factor in the achievement of high level performance (Ericsson et al., 1993; Morgan et al., 1987).

In addition to rest, another factor that contributed to the maintenance of the athletes' performance was the quality of their training. When they trained, they tried to do it with an extremely high quality even if they were tired or did not feel like it. They did not want to waste any time or energy. As previously mentioned, another factor was the

need to be innovative. Some athletes made changes in their training and developed new skills in an attempt to innovate and remain at the top of their sport. Some of these changes were worthwhile whereas others were not as beneficial. Despite this, the athletes accepted that this was part of their learning process and they drew important lessons to continue improving in the future. They did not appear to have had any regrets about the decisions they made.

The athletes also felt that it was important to continue improving the techniques and tactics they had acquired in previous stages. This suggests that deliberate practice was still very significant during the maintenance years. Krampe and Ericsson (1996) investigated the role of deliberate practice in the maintenance of cognitive-motor skills in 48 young and older expert and accomplished amateur pianists using retrospective interviews, diaries, and a series of laboratory experiments. They found that the older experts maintained a reduced but still high level of deliberate practice throughout their careers. In contrast, the level of deliberate practice of the older amateurs was low and a few of them had even completely stopped practicing. Results indicated that the older amateur pianists exhibited age-related performance decrements that corresponded to decrements in general processing speed. The older expert pianists showed similar age-related declines in general processing speed, however, they manifested little age-related declines in speeded music-related performance. The degree of maintenance of their relevant pianistic skills was predicted by the amount of deliberate practice they engaged in during late adulthood.

Krampe and Ericsson's (1996) findings are important because they suggest that once elite levels of performance are attained, they must be actively maintained through

regular deliberate practice. However, it also appears that the amount of deliberate practice required to maintain skills that were already acquired is less than the amount required to initially acquire them. This is interesting because as previously mentioned, several athletes in the current study felt that they did not necessarily have to train as much at this level.

One important issue to consider in sport is that certain physiological characteristics that limit performance, for example, maximum heart rate, show an inevitable decline with age that cannot be modified with practice (Hagberg et al., 1985). This is one of the reasons that most athletes reach their peak performances in their 20's as opposed to musicians and scientists who attain their highest levels of performance in late adulthood (Ericsson, 1990). These findings suggest that if athletes need to accumulate approximately 10 years of deliberate practice before reaching the pinnacle of their sport, they should start training as early as possible without compromising the variety and fun they need to experience at an early age in order to stay motivated and remain involved in sport.

Ericsson (1990) also raised the fact that the amount and intensity of deliberate practice that individuals can maintain with complete recovery on a daily basis also decrease as a function of age. This demonstrates the importance for athletes to get adequate rest on a daily basis and to be selective in the amount of physical and mental energy they invest in various activities in order to preserve their level of functioning in their sport during the maintenance years.

Ericsson (1996) identified another stage after which individuals become experts. He found that some experts engage in an additional 10,000 hours or 10 years of deliberate

practice to become eminent and make long lasting contributions in their field. It is interesting that R1 revealed that one of her goals was to leave a legacy in her sport. Some people would argue that she did because she invented movements that are performed by most synchronized swimmers today. Also, certain skills that she performed were so difficult and innovative that no one has even been able to reproduce them. R3 could also be considered as eminent because he broke world records on several occasions and his world record in the 100m backstroke still holds to this day. Finally, C5 made several significant contributions to his sport by inventing several jumps, one of which is named after him.

Competition

Competition during the maintenance years was similar to what the athletes experienced during the investment years. One difference was that there was often more pressure involved because sport and government affiliations, the public, and even friends and family expected them to do well considering that they had already won a gold medal. In order to cope with this, the athletes tried to keep their thoughts into perspective and stay focused on the process instead of the outcome or consequences of their events. They continued to prepare themselves by engaging in self-talk and imagery activities, which in turn helped them to control their level of intensity to perform. Resting and conserving energy were also important aspects of their preparation.

Another challenge many athletes faced at this level and to some extent during the investment years was dealing with the media before, during, and after competitions. Several of them isolated themselves from reporters in order to be able to concentrate on their event. Their coaches often facilitated this by organizing specific times when they

could talk to the media. These results suggest that coaches and athletes have to be well-prepared and organized to deal with both expected and unforeseen circumstances at high profile events. As highlighted by Orlick and Partington (1988), meticulous competition planning is crucial at a high level of achievement in sport.

It is interesting that some of the athletes struggled at the Olympics even after previously winning a gold medal at these events. One particular athlete experienced problems with his teammates because they were jealous of the fact that he was the defending Olympic champion and he received a lot of attention. They thought he was getting special favors and they resented him for this. It was clear that there was a lack of communication and cohesion among their team and this affected everyone's performance in the long run. Team cohesion has been found to be an important factor in both the development of teams and the achievement of success (Carron, 1993; Stevenson & Durand-Bush, 1999). When there is a lack of cohesion within a team, the athletes' chances of succeeding are diminished. The speed skating coach in the current study stressed the importance of working as a team before and at competitions. He said that one of the reasons his athletes did so well at the Olympics was because they supported and respected each other and they communicated well, even though some of them had to compete against each other. These findings emphasize that it is important for coaches to develop and maintain cohesion among team members, even if their team consists of individual sport athletes.

The athletes also discussed the actual process in which they engaged when they performed at the Olympics and World Championships. It is interesting that several of them highlighted the importance of focusing on the process of performance rather than

the results. This allowed them to concentrate on what they could control and it prevented them from putting too much pressure on themselves to win. Being connected or engaged in the process of performance appears to be a common goal of many expert performers because it enables them to enjoy and free themselves to perform and to be satisfied with their performance regardless of the outcome (Csikszentmihalyi et al., 1993; Newburg, 1995). It also leads them to more consistent performance because their focus is on the task at hand rather than on stressors or potential barriers. One athlete in the current study indicated that his ability to consistently reproduce great performances under pressure situations is what set him apart from his competitors. Extensive preparation and developing a high level of awareness and focus allowed him to do this.

Several athletes experienced some of their best and most memorable performances when they were engaged in the process of performance. In these situations, they were extremely confident, daring, determined, and focused. Many also felt powerful, invincible, and one athlete even said he was in a trance. These descriptions of peak performances resemble the experience of flow defined by Csikszentmihalyi and colleagues (1993). According to these authors, flow is a subjective state that can be experienced when individuals are completely connected to a task to the point of losing track of time, and unaware of fatigue and everything else besides the activity itself. Several athletes used these descriptors when discussing their peak performances. One athlete summarized it by saying that when she can't remember a particular performance, it is because it was a good one. Csikszentmihalyi et al. noted that flow contributes to the development of expertise because it is an enjoyable experience that motivates individuals

to continue improving their skills and engage in more deliberate practice in order to achieve higher levels in their domain.

Jackson (1995) found that mental and physical preparation, confidence, focus, optimal levels of motivation and arousal, and positive feelings of performance influenced the occurrence of flow in elite athletes. Some of the athletes in the current study reported that these factors were precursors of their peak performances. One athlete attempted to describe the positive, intangible feelings she experienced when she performed under flow. Similar to what Jackson found in her study, she said that sometimes she could control flow and make it happen on purpose, however, other times she was not able to do this. She noted that flow sometimes occurred spontaneously without much preparation or focus.

In sum, competition during the maintenance years required intense mental and physical preparation, as well as adequate recovery periods. The athletes experienced both peak experiences and setbacks that fuelled their passion to learn and to get more connected with the process of performance.

Recommendations from Participants

The athletes, parents, and coaches in the current study were asked to share the advice they would give to children who want to become the best in a sport. They were also asked to provide recommendations to parents and coaches who guide children in this process. Their responses were interesting and reflected in many ways what they experienced in their own personal lives.

Most of them said that it is very important for children to love their sport and to focus on having fun. Many of them also emphasized the need to develop goals,

determination, and a strong work ethic. An additional recommendation was that they refrain from focusing too much on winning or becoming the best. This recommendation has important implications because many athletes who put too much pressure on themselves to win or who are immersed in an environment in which parents and coaches focus too much on winning are at risk of dropping out of sports during their childhood or adolescence (Ewing et al., 1996; Weinberg & Gould, 1995). C2 summarized it best by saying, “You have to have a goal but put it in the top shelf somewhere and close that drawer. It’s there but don’t dwell on it otherwise you will get burned out.”

In terms of recommendations for coaches, some athletes reported that coaches should be aware of their athletes’ needs and know when to push and when to back off. They also recommended that they provide children with a nurturing environment in which they can be positively challenged and have fun. Parents also recommended that coaches create a fun, supportive, and equitable environment for athletes. These recommendations corroborate the findings of B. S. Bloom (1985), Csikszentmihalyi and colleagues (1993), Carlson (1993), and Côté and Hay (in press) who indicated that coaches should support children and emphasize fun when they are young. One coach suggested that coaches be positive, creative, and team-oriented. The other two coaches recommended that they help athletes develop confidence. Once again, the importance of self-confidence is raised as an important factor in the development of expertise in sport.

Common suggestions for parents were that they allow their children to pursue sports they enjoy and give them the freedom to develop at their own pace. It was emphasized that they refrain from pressuring them to win or to be the best. This

reinforces the point that was made earlier about putting more emphasis on enjoyment than winning.

In sum, the participants' recommendations confirmed that enjoyment, dedication, hard work, and support are extremely important factors in the development of expert performance. Implications are that parents and coaches should provide positive and supportive environments in which children can develop skills and have fun. On the other hand, children must realize that although fun is part of the process of talent development, they have to be dedicated and willing to work hard to achieve their ultimate goals in sport.

Concept Mapping

The second phase of this study involved a concept mapping activity that was performed with three of the ten athletes. Concept mapping is a valid research methodology that has been increasingly used in the fields of education and administration (Tesch, 1990; Trochim, 1989), yet it has never been used to study the development of expertise. Hence, this phase of the study was innovative and exploratory in nature. The intention was to use the data elicited from the concept mapping activity to verify and complement the data from the athletes' interviews and also to verify the analyses that were performed during the first phase of the study.

Ratings

The athletes were asked to rate the factors included on the index cards based on how important they were for the development of their performance and how important they were for the maintenance of their performance. Results indicated that although many factors were perceived to be highly important for both the development and maintenance

of their performance, some of them were seen as being more important during the development years than in the maintenance years or vice versa (please refer to Table 9). Of interest is that these perceived differences varied across the athletes. For example, one factor that was perceived to be more important in the maintenance years by one athlete was not necessarily viewed as being more important by another. This highlights the individuality and uniqueness in some of the athletes' perceptions. It also suggests that their results cannot be generalized to the rest of the athletes.

Approximately half of the factors (i.e., 13 out of 25) that were perceived to be highly different between the development and maintenance years pertained to the context of the athletes. In general, being involved in the community, moving to another city to train, and centralizing to train were perceived as being more important during the maintenance years. These findings corroborate what the athletes shared during their interviews. For example, one athlete had to move to another city to train in a centralized location with teammates for five months during the maintenance years to prepare for the Olympics and she found this to be extremely beneficial. She noted that she did not have the opportunity to do this during the development years. Being raised in a small town and having the opportunity to participate in a variety of sports, compete a lot, and experience early success in sport was perceived as being more important during the development years. Results of the interviews also showed that these factors were more prevalent during the development years.

Resources such as siblings, sport psychologists, fitness trainers, and partners were perceived as being more important during the maintenance years, as were having a variety of coaches and financial resources. Teachers on the other hand were perceived by

two athletes as having more influence during the development years. The fact that one athlete indicated that siblings were more important during the maintenance years is interesting because the common perception during the interviews was that family members were important throughout the athletes' career. The fact that athletes rated working with a wide variety of coaches, sport psychologists, and fitness trainers as being more important during the maintenance years was not surprising because this was clearly mentioned during the interviews. It is interesting that two of the athletes found their teachers to be more influential during their development years. This is most likely due to the fact that they had completed their formal education by the time they reached the maintenance years.

Five of the 25 factors that were rated differently between the development and maintenance years pertained to training. Engaging in structured and regimented training activities was viewed as being more important during the maintenance years, as was tactical training and activities such as meditation, Zen, and hypnosis. It was quite evident during the interviews that training was more structured and regimented during the maintenance years, although it was during the investment years as well. The fact that tactical training was perceived by one athlete as being more important during the maintenance years was not surprising because she played a team sport and she indicated that developing tactics was extremely important at that stage. On the other hand, her perception that meditation, Zen, or hypnosis was more influential during the maintenance years was unexpected because she had not discussed this during her interview.

Another 5 of the 25 factors concerned competition. Pressure from the media and other people's high expectations at important competitions as well as pressure from the

public after important competitions were perceived as being more important during the maintenance years. Once again, these results emerged during the interviews. Feeling comfortable and at peace before competitions and evaluating successful performances after competitions were also perceived to be more important during the maintenance years. These findings also corroborate what the athletes revealed during their interviews.

Only 2 of the 25 factors that were perceived to be different between the development and maintenance years targeted the athletes' personal characteristics. Being a leader and being innovative in sport were perceived as being more important in the maintenance years than in the development years. It is noteworthy that both C2 and her coach indicated that she was a leader in her sport, particularly during the maintenance years because she was really independent at that stage. The fact that R3 indicated that being innovative in his sport was more important during the maintenance years was not surprising because other athletes reported this during their interviews, yet, in some way it was not expected because he did not specifically discuss this during his own interview.

Conceptual Maps

The concept maps that the athletes created also provided additional data regarding the factors deemed important in the development of expert performance (see Figures 1, 2, and 3 in the Results section). In general, all three athletes included the broader conceptual categories of Context, Personal Characteristics, Training, and Competition in their maps. C4 also included Organization but it was only a minor component in her map. These findings suggest that organization was not perceived as an important component in the development and maintenance of their performance. On the other hand, it was perceived to be a central component in the study of Côté, Salmela, Trudel et al. (1995). It is

important to note that they examined the development of expert coaches rather than athletes, thus organization appears to be a task that concerns more coaches than athletes.

All of the sub-categories that the athletes created under the higher-order categories were categories that also emerged during the inductive analysis of the interviews. In other words, the factors they conceptualized during the concept mapping activity were congruent with the factors they discussed during the interviews. It is interesting that each athlete highlighted certain categories in their maps to give more meaning to certain factors. For example, C2 created a special category that pertained to coaching to emphasize its importance. She also underscored that mental preparation was extremely important in both training and competition. This strengthens what she said in her interview regarding the importance of coaching and mental preparation in her development.

C4 indicated that her context was central to her development and this was not surprising because she discussed several contextual factors during her interview that contributed to her development. She also highlighted the fact that remaining innovative in her sport was extremely important throughout her career. This finding is interesting because she did not discuss this during her interview. It reinforces what the other athletes said about the importance of being innovative in sport and it also suggests that being innovative might not only be significant during the maintenance years but also during earlier stages of development.

R3 also created a category to emphasize the importance of coaching. This confirms the observation he made during his interview that the coaches he had throughout his career were important and influenced him in many positive ways. Another

category that he singled out pertained to recovery. This substantiates the findings that emerged from the interviews and those that were found in the literature regarding the importance of recovery (Morgan et al., 1987). R3 also created a sub-category in his map to highlight the importance of preparing for competitions. Once again, this gives credence to findings in the literature suggesting that competition planning is extremely important in high level sport (Orlick & Partington, 1988). Finally, being innovative was accentuated and noted as being particularly important in his sport. Although R3 did not discuss this in his interview, it once again demonstrates that being innovative is particularly significant in the development of expert performance. It is interesting that both C4 and R3 emphasized this in their maps but did not discuss it during their interview. Had they not performed the concept mapping activity, these perceptions would not have emerged.

In sum, each of the athletes' maps comprised both common and unique categories that were organized in a particular fashion. Several common relationships between the categories were also identified. It is noteworthy that the information that emerged from their maps complemented and confirmed the data they provided during their interview. The concept mapping activity also allowed the emergence of additional pertinent information regarding factors they perceived to be important in the development of their performance. Concept mapping is an innovative strategy that should be utilized and refined in future research in the areas of sport and expertise because it provides opportunities to not only triangulate data but also to examine and conceptualize the perceptions of participants in very meaningful ways.

Limitations

The current study generated several important findings regarding the development and maintenance of expert performance in sport, however, certain limitations must be discussed and should be taken into consideration for future research. The first limitation is that only 10 athletes participated in the current study thus more research must be conducted with World and Olympic champions before generalizations can be made to the rest of the population of expert athletes. Sampling in this study was not driven by a concern with representativeness because the quest for conventional generalizability was not an issue. The purpose was more to uncover and understand the factors that helped athletes to become experts in their sport.

Researcher bias is a limitation in qualitative inquiries in which the researcher acts as the instrument (Huberman & Miles, 1994). Proponents of the postpositivist paradigm advocate that although researchers and participants influence each other to a certain extent during an inquiry, it is important that the former remain objective by comparing findings to pre-existing knowledge and by subjecting them to a review by peers and referees (Guba & Lincoln, 1994). An attempt was made in this study to remain as objective as possible during the interviews and the concept mapping activity in order to avoid influencing the responses of the participants. The findings of this study were compared to the literature. Peer debriefing sessions in which various issues relating to the analysis and interpretation of the results were discussed, also served to maximize the objectivity and validity of this inquiry. Nonetheless, previous knowledge and biases could have influenced the results to a certain extent.

The use of retrospective, self-reported data is another potential limitation of this investigation. Respondent bias, faulty recall, poor articulation, and de-contextualization could have potentially influenced the data (Creswell, 1994). An attempt was made to circumvent this limitation by triangulating the data elicited from the athletes with those provided by the parents and coaches. It is strongly recommended that parents and coaches be included in future research on expertise in sport not only for triangulation purposes but also for generating more depth to the findings that have been obtained thus far.

Another important limitation in this study was time. Due to the athletes' busy schedules, the time they could invest during their interview was in most cases limited. It is likely that more in-depth information could have been gathered had they had time for a second interview. In this case, they could have been questioned in more detail about certain aspects that emerged in their first interview or in the interviews conducted with other participants. Using an open-ended and semi-structured interview format was important in the current study because the purpose was to allow the participants to share extensive information pertaining to expertise in sport. Because empirical information regarding this topic remained limited, it was important to use a more open-ended method to let the data emerge during the interviews. However, perhaps the use of focus groups or structured interviews would be beneficial in future research if time constraints are a serious issue. These approaches might also be useful to extend the results of the current study and provide a more thorough investigation of specific factors that were deemed important. A structured format could also provide a basis for more direct comparisons between the perceptions of the participants.

Concept mapping was another pertinent method that was used to collect data in this study. This innovative strategy served to authenticate the data gathered from the athletes and to verify the analysis of the data as well. Concept mapping could be used in future studies to collect more in-depth information regarding the development of expertise in sport and this could be done on an individual or group basis. Trochim (1989) and Miles and Khattri (1995) demonstrated how concept mapping can be applied with groups of individuals to develop a conceptual framework to guide research and practice in a particular domain. Thus, it would be interesting to engage a team of athletes in a concept mapping activity to develop a holistic map that could further guide the research and practice of individuals involved in the development of expert athletic performance. One suggestion would be to ask the participants to generate the categories and conceptualize them on their own without having a pre-determined set of categories and broader conceptual components like the athletes did in the current study. Concept mapping could also be performed with a group of parents or coaches and the ensuing results could be compared to those of the athletes. This would require that the participants be available at the same time and be willing to meet in one place to perform the activity. It could be challenging, for example, to get a group of expert athletes to meet all together if they do not train or live in the same city.

One limitation of the concept mapping activity was the amount of time the athletes could dedicate to it. It became readily apparent that this type of activity requires considerable time and the participants should be made aware of this before committing to doing it. It is recommended that more than one meeting be scheduled to perform the activity in order to avoid overloading the participants with information during one

session. Another recommendation concerning concept mapping is to record and analyze the thought processes of the participants as they create their maps. This would enable researchers to examine the reasons why participants rate and structure factors in a certain way. The concept mapping activity was tape-recorded in the current study, however, it was beyond its scope to transcribe and analyze all of this data. This will be the objective of a future research project.

According to Huberman and Miles (1994), a potential limitation of qualitative research and analysis is data overload, which sometimes leads researchers to miss important information, overemphasize certain findings or skew the analysis. Other shortcomings of qualitative analysis include: a) misinterpreting first impressions, b) overplaying observations of highly concrete or dramatic events; c) being selective or overconfident in some of the data, especially when trying to confirm a key finding; d) taking co-occurrences as correlations or even as causal relationships; e) falsely extrapolating the number of total instances from those observed; f) reporting unreliable information from certain sources; and g) being overaccommodating to information that utterly questions a tentative hypothesis. Huberman and Miles reported that one way of gaining advantage over these last two limitations is by triangulating the data, that is, by using multiple measures to ensure that the findings are a reflection of the actual phenomenon under investigation and not that of the measures. As previously mentioned, efforts were made in this study to use multiple sources and modes of evidence and also to double-check the findings with external peers. However, it is always possible that some of the findings did not accurately reflect the reality of every participant. The results of the analysis could have been sent to the participants for verification but due to their time

constraints, this was not a sensible option. Time permitting, this step should be undertaken in future studies attempting to replicate the findings of this study.

Future Research

Several recommendations for future research have been made throughout the discussion. Following is a summary of these recommendations. Researchers should continue to examine the perceptions of World and Olympic champions because much can be learned from these exceptional individuals. Their knowledge and understanding of the expertise phenomenon can be used to guide the development of future models or theories of sport expertise. On a more practical basis, their perceptions can be used to facilitate the actions of coaches, parents, sport administrators, policy makers, as well as those of other athletes aspiring to excel in a particular sport. Since parents and coaches play a crucial role in the development of outstanding performance, more research should focus on uncovering exactly what it is they do to support, motivate, and guide athletes in their development. Siblings, friends, and support staff also appear to influence the development of athletes yet their perceptions have not been extensively investigated. More research should be conducted with these individuals to further examine how they contribute to the talent development process.

Other suggestions for future research include assessing the role and contribution of education at various stages of development in sport. Most athletes in the current study pursued both their education and sport at a high level thus it would be valuable to further analyze how they were able to balance school and sport, given the time and resource constraints they faced in their development.

The framework of Ericsson and colleagues (1993) requires further investigation in the domain of sport because some of its fundamental tenets (i.e., 10 year rule, enjoyment dimension) are questionable. Deliberate play, an extended new construct of the deliberate practice framework, appears to be important in early stages of development. More studies need to be carried out to assess the exact contributions of deliberate play versus those of deliberate practice at various stages of talent development in sport.

Enjoyment was one of the most significant factors linked to persistence and continued involvement in the current study. Consequently, more research should be conducted to examine the specific sources of enjoyment that athletes require to remain engaged at different levels of development in their sport, particularly at higher levels when motivational and effort constraints are elevated due to extensive and intense training. Flow was shown to be a source of enjoyment in the lives of talented athletes (Csikszentmihalyi et al., 1993, Jackson, 1995), however, more research should be implemented to determine how flow can enhance the development of their performance at various stages of their career and how they can experience it on a more consistent basis.

Mental training was important to many athletes in the current study, especially during the investment and maintenance years. An interesting finding was that aside from using traditional techniques such as visualization and self-talk, the athletes spent considerable time developing mental skills and strategies in less structured ways. Simply thinking about their sport on a regular basis appeared to have contributed to the development of valuable cognitive processes and skills. Future research should explore

these less traditional ways of cognitive engagement and preparation in order to enhance the strategies used by athletes.

Focusing on the process rather than the outcome of performance was another significant finding in this study that warrants further investigation. Athletes, parents, and coaches reiterated the fact that this type of focus reduced stress and pressure and enabled the athletes to enjoy their performance and to be successful. Researchers should attempt to uncover how athletes develop this type of focus and apply it on a consistent basis under the most adverse competitive situations. Many practicing athletes involved at various levels in sport could benefit from these potential findings.

Being innovative and engaging in high quality training was perceived by many athletes to be important during the maintenance years. These findings should be further investigated to see if they are significant in other sport contexts and at other stages of participation in sport. It would be interesting to identify specific strategies that athletes and coaches use to be innovative and to ensure that quality is respected on a regular basis. All of the factors deemed important in the maintenance years are particularly significant in this study because very little research has examined how athletes maintain their performance once they reach the pinnacle of their sport. Further research should be conducted to provide more empirical information regarding this stage of performance in sport.

Final recommendations for future research concern the models of Côté and Hay (in press) and Côté, Salmela, Trudel et al. (1995). Although it was not a purpose of this study to validate these models, results provided support for several of their components. First, it was found that the athletes progressed through stages during their athletic career

that were similar to those described by Côté and Hay, that is, the Sampling, Specializing, and Investment Years. However, an additional stage entitled “Maintenance Years” was proposed in the current study to account for factors that were perceived to be relevant at the highest level of expertise in sport. Côté and Hay’s model is still tentative because it has just been recently published and has not been validated in many sport contexts. Future studies should focus on validating this model, including the stage of Maintenance Years that was put forth in this study in an attempt to extend the model.

Results of this inquiry also showed that the factors the athletes, parents, and coaches perceived to be important in the development and maintenance of expert performance concerned the athletes’ context, personal characteristics, training, and competition. These findings give credence to most of the components included in Côté, Salmela, Trudel et al.’s (1995) coaching model. The Organization component was not confirmed but this is not surprising since organizational tasks are generally performed by coaches. The coaches in this study were not specifically asked during their interview to discuss the organizational tasks they perform when working with athletes. Rather, they were asked to talk about the development of the athletes and the tasks the athletes had to perform to reach an expert status.

Gilbert and Trudel (in press) validated Côté, Salmela, Trudel et al.’s (1995) coaching model in the sport of hockey. They noted that this model provides a valuable basis for future research and for the development of practical applications that could be used to enhance the performance of coaches and athletes. They also suggested that more research needs to be conducted to validate the coaching model in various sport contexts.

These recommendations for future research bring this chapter to an end. The conclusions of this study are presented in the following chapter.

CHAPTER VI

CONCLUSIONS

This study is significant because it provided extensive empirical information on the development and maintenance of expert performance in sport. It fills a gap in the literature and extends the existing knowledge base regarding factors that are required to succeed at various levels in sport.

K. T. Thomas and J. R. Thomas (1994) raised the need to conduct research in the domain of expertise using designs in which several factors affecting real life experiences can be simultaneously investigated. This study was conducted to respond to this need. It is unique and extends the literature in several ways because it provided empirical data from not only athletes, but also their parents and coaches. The perspectives of athletes, parents, and coaches are quite sparse in the literature because traditionally, expertise was investigated using experimental designs in laboratories.

This study contributes to the literature from not only a theoretical but also a methodological standpoint. A combination of interviews and concept mapping were utilized to elicit data from the participants. While conducting interviews is a common procedure in the domains of education, sport psychology, and the general social sciences, concept mapping is not. In fact, concept mapping has never been used to examine the development of sport expertise. It proved to be an appropriate and interesting method to examine the perceptions of the athletes. It was also particularly useful for triangulating data. Although concept mapping has its limitations, researchers should continue to refine and utilize this method in future research in this area.

This study also offers several practical implications for athletes, coaches, parents, sport administrators, and policy makers who wish to increase the quality of participation of athletes at various levels in sport. Results can be used to guide the development of future sport programs, the training of coaches and athletes, and the provision of resources by parents. Following is a summary of the findings.

The data that emerged in this study covered a significant part of the lives of some of the best athletes in the world. These outstanding individuals identified several factors that were important to them at different stages of their athletic career. Briefly, results suggested that they progressed through four stages during their career, that is, the sampling, specializing, investment, and maintenance years. Factors that were perceived to be significant across these stages pertained to their context, personal characteristics, training, and competition.

Common findings were that the athletes' parents and coaches were extremely valuable resources throughout their career. As the athletes progressed in their sport, other resources such as sport psychologists and exercise physiologists played a significant role. Education was perceived to be very important by both the athletes and their parents and most of the athletes managed to pursue their sport and school at a high level. Significant personal attributes that contributed to their overall development included a love for sports, enjoyment, self-confidence, determination, perseverance, a strong work ethic, and natural talent.

Training was generally geared toward improving physical, technical, mental, and tactical skills. During the sampling years, the emphasis in training was on having fun, however, as the athletes moved to a higher level in their sport, it became more arduous,

intense and focused on quality. Competition also became more demanding as the athletes progressed toward the investment and maintenance years. They engaged in extensive preparation and developed strategies to be able to cope with the pressure and focus on the process of their performance.

Once the athletes reached the maintenance years, there were several additional demands and more pressure with which they had to deal. Although the athletes were very independent at that stage, coaches and other support staff assisted them in developing strategies to maximize their performance. Being efficient and innovative was very important, as was engaging in high quality training. Incorporating adequate recovery periods in their schedule was also crucial to allow the athletes to mentally and physically recover from their intense training and competitions.

It can be concluded from this study that several factors were perceived to be important in the development and maintenance of expert performance. Although some factors played a significant role throughout the athletes' lives, others were more relevant at particular stages. There were many similarities in the perceptions of the participants, however, there were some differences as well. The athletes did not all follow the same path to become World and Olympic champions. This is important because it suggests that athletes can take different routes, use various resources and strategies, and be innovative and creative as they develop and maintain their expertise in sport.

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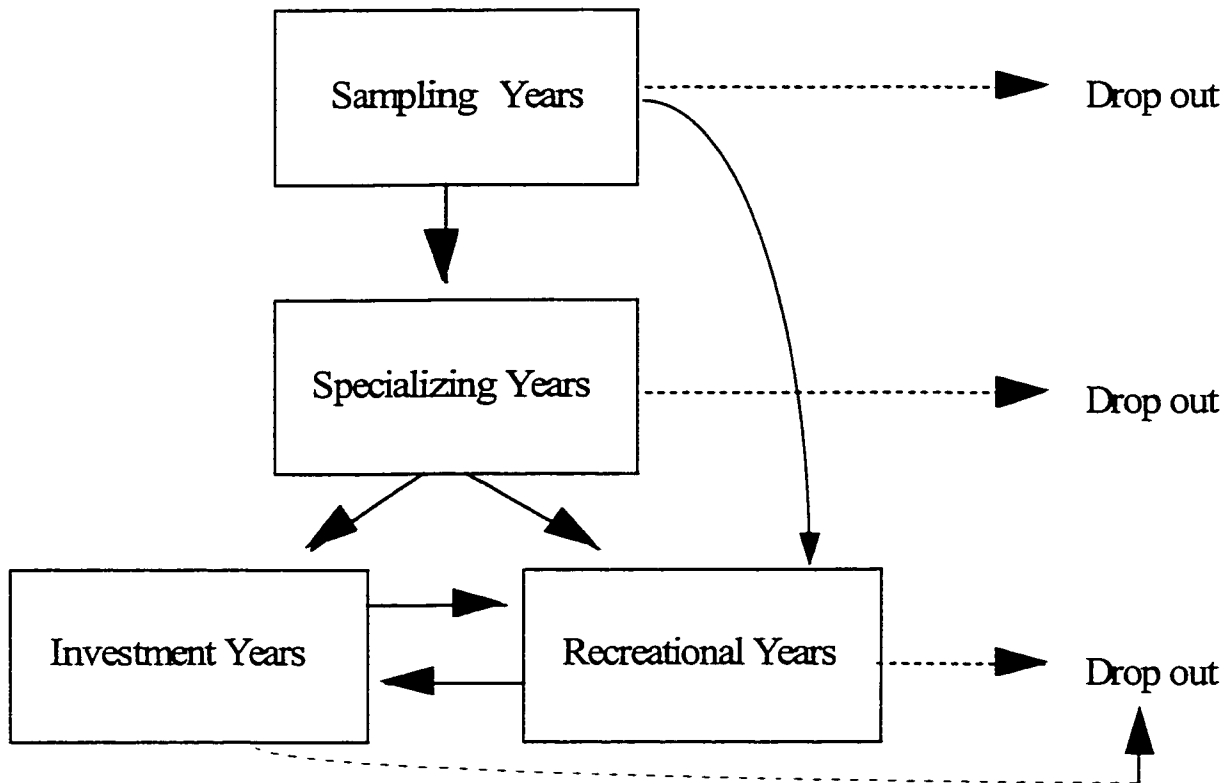
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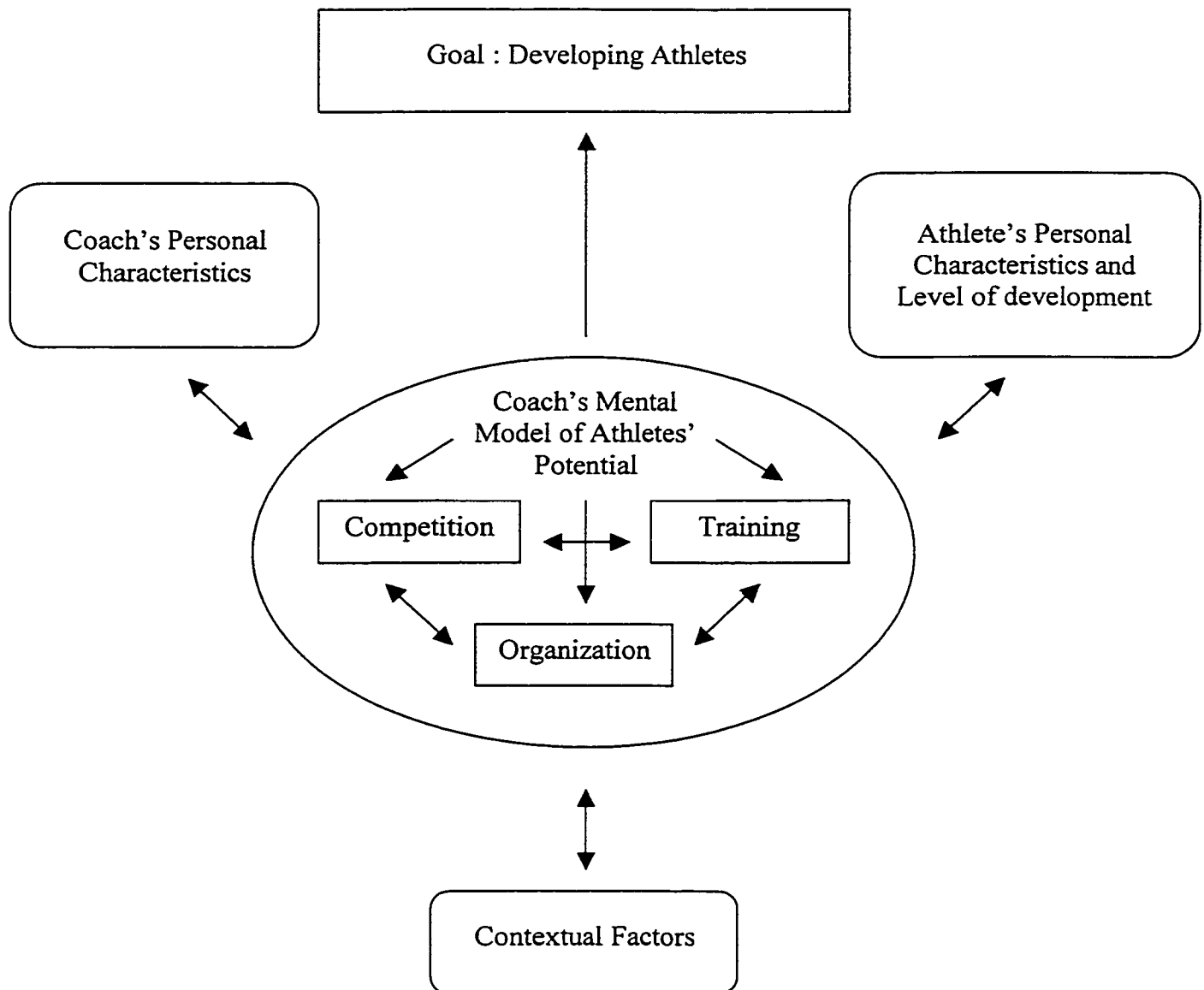
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**APPENDIX A - STAGES OF SPORT PARTICIPATION
FROM EARLY CHILDHOOD TO LATE ADOLESCENCE
(Côté & Hay, in press)**



APPENDIX B – THE COACHING MODEL
(Côté, Salmela, Trudel, Baria, & Russell, 1995)



APPENDIX C - RATIONALE FOR CHOOSING THE POSTPOSITIVIST PARADIGM BASED ON FUNDAMENTAL BELIEFS OF COMPETING PARADIGMS IN QUALITATIVE RESEARCH (Guba & Lincoln, 1994)

Item	Constructivism [naturalistic]	Positivism	Postpositivism	Rationale for choosing the postpositivist paradigm
Ontology	• <i>Relativism</i> - realities are apprehensible in the form of multiple, intangible mental constructions. • They are local and specific in nature, alterable, socially and experientially based, and are not more or less true in any absolute sense but simply more or less informed and/or sophisticated.	• <i>Naïve realism</i> - reality exists and is apprehensible. • Investigator determines "how things really are" and "how things really work." • Knowledge summarized in the form of time- and context-free generalization.	• <i>Critical realism</i> - reality exists but is only imperfectly and probabilistically apprehensible. • Reality must be subjected to the widest possible critical examination in order to apprehend it as closely as possible, but never perfectly.	• Like Miles and Huberman (1985), I would argue that social phenomena exist not only in the mind but also in the objective world, and that lawful, reasonably stable relationships that guide our everyday life can be derived from the regularities that link phenomena together.
Epistemology	• <i>Transactional/subjectivist</i> - investigator and investigated object are interactively linked. • Participants are the object of inquiries, that is, they are seen as an end rather than a means to an end. • Findings are value mediated and created as an inquiry evolves. • Knowledge is accumulated through frequent and lengthy interactions with participants. • No emphasis placed on fitting findings with preexisting knowledge.	• <i>Dualist/objectivist</i> - investigator and investigated object are independent entities. • Values and biases are prevented from influencing outcomes. • Replicable findings are true.	• <i>Modified dualist/objectivist</i> - object are more or less dependent entities that will influence each other to some extent during the investigation process. • Emphasis is still placed on external guardians of objectivity such as critical traditions (do findings fit with preexisting knowledge?) and the critical community (i.e., editors, referees, professional peers). • Replicated findings are probably true but always subject to falsification.	• I elicited knowledge from the participants via a more interactional process. By being engaged in the interview process, they were able to share their experiences, and more importantly, those key factors that led them to their current level of performance. • The focus of this inquiry was on the larger phenomenon of expertise rather than on the individual athletes themselves - thus, it was more a multiple case study in which the exploration and understanding of a number of cases led to a better understanding of, and theorizing about a larger collection of cases (Stake, 1978). • Due to time constraints involved in sampling expert performers, I did not engage in lengthy and repetitive interactions with the participants.

Appendix C (continued)

Epistemology
(cont'd)

- A review of the literature revealed that several factors can impact the development of expertise and I discussed these in light of my research outcomes (i.e., determined if my findings fit with preexisting knowledge).
- It was important to minimize any bias that could have been introduced as a result of our interactions during the interviews. Consequently, I avoided leading the participants and giving my personal opinions, and I tried to paraphrase using their own words during our conversations.
- A team of professional peers helped to carry out internal checks on the rigor of the study.

Methodology

- | | | | |
|--|---|---|--|
| <ul style="list-style-type: none"> • <i>Hermeneutical/ dialectical</i> - constructions can be elicited and refined only through dialogue between and among investigator and participants. • Aimed at describing individuals' realities rather than testing or controlling for influential factors, establishing cause-effect relationships, or predicting future outcomes. | <ul style="list-style-type: none"> • <i>Experimental/ manipulative</i> - conditions are explicitly controlled and manipulated to prevent outcomes from being falsely influenced. • Postulation and verification of hypotheses. • Chiefly quantitative methods. | <ul style="list-style-type: none"> • <i>Modified experimental/ manipulative</i> • Critical multipism - modernized version of triangulation as a way of falsifying hypotheses. • Utilization of both quantitative and qualitative methods - inquiry in more natural settings, collection of more situational information, reintroduction of discovery as an element of inquiry, solicitation of emic viewpoints to determine meanings and purposes of participants' actions. • Merit in both "loose," inductively oriented designs, and "tight," more deductive ones (Miles & Huberman, 1994). • Suited to find causal relationships and rule out rival hypotheses to understand how and why phenomena occur. | <ul style="list-style-type: none"> • Qualitative methods were used to collect the data. However, both qualitative and quantitative measures were used to analyze them. • Control and prediction were not direct aims of this inquiry, instead, I identified and linked factors that lead to the development of expert performance. • The data elicited from the athletes were triangulated with those collected from the parents and coaches and from the concept mapping activity. |
|--|---|---|--|

APPENDIX D – ATHLETES' INTERVIEW GUIDE

EARLY YEARS

- Take me back to the beginning when you picked up a hockey stick for the very first time (i.e., in the case of a hockey player). Tell me about that time.
- When did you first know you were special?
- What makes you say this?
- What kind of people did you have around you at that time? Talk to me about your parents, coaches, teammates, friends.

MIDDLE YEARS

- When did you know hockey was going to be a big part of your life?
 - What made you realize this?
 - Who helped you at that point?
-

- When did you know you were good?
 - Is there a particular incident you remember?
 - What did you have to do to get there?
-

LATE YEARS

- When did you know you were one of the best?
 - What did you have to do to get there?
 - What made you want to get there?
 - Was there anyone helping you then?
-

- Tell me about the training you did at different stages of your life.
- How did you prepare for high profile events like the Olympics and World Championships?
- Once you achieved the top in your sport, that is, once you won a gold medal at the Olympics or World Championships, what did you have to do to 1) maintain your level of performance, and 2) keep improving it?
- Can you get any better now? If so, what do you need to get better at this stage?
- Would you do it all over again? If so, would you change anything?
- What do you recommend to athletes who aspire to excel in their sport?
- What do you recommend to coaches and parents who guide athletes in their pursuit of excellence?

APPENDIX E – PARENTS' / COACHES' INTERVIEW GUIDE

EARLY YEARS

- Take me back to the beginning when your child/athlete picked up a hockey stick for the very first time (i.e., in the case of a hockey player). Tell me about that time.
- When did you first know he/she was special?
- What makes you say this?
- What kind of people did he/she have around him/her at that time (i.e., coaches, teammates, friends)? Talk to me about your role as parents/coaches.

MIDDLE YEARS

- When did you know hockey was going to be a big part of his/her life?
 - What made you realize this?
 - Who helped him/her at that point?
 - What was your role at that point?
-

- When did you know he/she was good?
 - Is there a particular incident you remember?
 - What did he/she have to do to get there?
-

LATE YEARS

- When did you know he/she was one of the best?
 - What did he/she have to do to get to there?
 - What made him/her want to get there?
 - Was there anyone helping him/her then?
-

- Tell me about the training he/she did at different stages of his/her life.
- How did he/she prepare for high profile events like the Olympics and World Championships?
- Once he/she achieved the top in his/her sport, that is, once he/she won a gold medal at the Olympics or World Championships, what did he/she have to do to 1) maintain his/her level of performance, and 2) keep improving it?
- Can he/she get any better now? If so, what does he/she need to get better at this stage?
- Would you want to go through this experience again? Is so, would you change anything?
- What do you recommend to athletes who aspire to excel in their sport?
- What do you recommend to coaches and parents who guide athletes in their pursuit of excellence?

APPENDIX F – LETTER OF INFORMATION TO ATHLETES

January 20th, 1998

Dear athlete,

The purpose of this letter is to ask you to grant me, at the most, two hours of your time to participate in an interview as part of my doctoral research. I have been working with national and international level athletes and sport organizations for several years now. For example, I have been involved, with Dr. John Salmela, in the development of new international standards and rules for women's gymnastics. I also conducted interviews with national and international level coaches to examine their training routines and strategies for developing elite athletes, after which I wrote a chapter in the book "Great Job Coach! Getting the Edge from Proven Winners." In addition, as a performance enhancement consultant with the Canadian Water Polo and Table Tennis teams, I have been committed to helping athletes nurture their passion and skills to perform on a consistent basis and to achieve their most precious goals.

Presently, I am completing a doctoral degree at the University of Ottawa of which the goal is to better understand how exceptional athletes, like you, managed to reach such a high level of excellence. In addition to providing rich information for my doctoral thesis, the data collected will surely have a positive impact on many young athletes who dream of winning a gold medal and want to actualize their potential.

I have already interviewed Olympic and World champions from several countries and it is important that I learn about the experiences of as many athletes as possible. This is why I would like to meet with you to conduct an interview of about two hours that would focus on the elements you believe have played a key role in the development of your expertise. Also, it is likely that one or a few of your coaches, as well as your parents had a significant impact on your career. I would like, if this is possible, to interview one of them according to your preference.

My experience with other athletes has shown that the interview is enjoyable, informative and can provide you with a new vision of your own development as an athlete. Rest assured that our conversation will remain confidential, that is, your responses will be incorporated to those of other athletes in a way to prevent a reader from recognizing you in the project. I am also committing myself to give you a summary report of the findings of the study. I would be happy to meet you for this interview at a convenient time and place, even during the holidays.

I would like to take this opportunity to thank you for your attention. Please do not hesitate to contact me if you have any questions or if you want more information.

Sincerely,

Natalie Durand-Bush, M.A., Ph.D. can

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P.S. I would appreciate it if you could call me collect to inform me of your response.

LETTER OF INFORMATION TO PARENTS

January 20th, 1998

Dear parent,

The purpose of this letter is to ask you to grant me, at the most, one hour of your time to participate in an interview as part of my doctoral research. I have been working with national and international level athletes and sport organizations for several years now. For example, I have been involved, with Dr. John Salmela, in the development of new international standards and rules for women's gymnastics. I also conducted interviews with national and international level coaches to examine their training routines and strategies for developing elite athletes, after which I wrote a chapter in the book "Great Job Coach! Getting the Edge from Proven Winners." In addition, as a performance enhancement consultant with the Canadian Water Polo and Table Tennis teams, I have been committed to helping athletes nurture their passion and skills to perform on a consistent basis and to achieve their most precious goals.

Presently, I am completing a doctoral degree at the University of Ottawa of which the goal is to better understand how exceptional athletes manage to reach such a high level of excellence. In addition to providing rich information for my doctoral thesis, the data collected will surely have a positive impact on many young athletes who dream of winning a gold medal and want to actualize their potential.

I have already interviewed Olympic and World champions from several countries and it is important that I learn about the experiences of as many athletes as possible. As a parent, it is likely that you have had a significant impact on your child's career. This is why I would like to meet with you to conduct an interview of about one hour that would focus on the elements you believe have played a key role in the development of your child's expertise.

My experience with other participants has shown that the interview is enjoyable, informative and can provide you with a new vision of the development of exceptional athletic performance. Rest assured that our conversation will remain confidential, that is, your responses will be incorporated to those of other participants in a way to prevent a reader from recognizing you in the project. I am also committing myself to give you a summary report of the findings of the study. I would be happy to meet you for this interview at a convenient time and place.

I would like to take this opportunity to thank you for your attention. Please do not hesitate to contact me if you have any questions or if you want more information.

Sincerely,

Natalie Durand-Bush, M.A., Ph.D. can

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P.S. I would appreciate it if you could call me collect to inform me of your response.

LETTER OF INFORMATION TO COACHES

January 20th, 1998

Dear coach,

The purpose of this letter is to ask you to grant me, at the most, one hour of your time to participate in an interview as part of my doctoral research. I have been working with national and international level athletes and sport organizations for several years now. For example, I have been involved, with Dr. John Salmela, in the development of new international standards and rules for women's gymnastics. I also conducted interviews with national and international level coaches to examine their training routines and strategies for developing elite athletes, after which I wrote a chapter in the book "Great Job Coach! Getting the Edge from Proven Winners." In addition, as a performance enhancement consultant with the Canadian Water Polo and Table Tennis teams, I have been committed to helping athletes nurture their passion and skills to perform on a consistent basis and to achieve their most precious goals.

Presently, I am completing a doctoral degree at the University of Ottawa of which the goal is to better understand how exceptional athletes manage to reach such a high level of excellence. In addition to providing rich information for my doctoral thesis, the data collected will surely have a positive impact on many young athletes who dream of winning a gold medal and want to actualize their potential.

I have already interviewed Olympic and World champions from several countries and it is important that I learn about the experiences of as many athletes as possible. As a coach, it is likely that you have had a significant impact on the career of the athletes with whom you work. This is why I would like to meet with you to conduct an interview of about one hour that would focus on the elements you believe have played a key role in the development of a particular athlete's expertise.

My experience with other participants has shown that the interview is enjoyable, informative and can provide you with a new vision of the development of exceptional athletic performance. Rest assured that our conversation will remain confidential, that is, your responses will be incorporated to those of other participants in a way to prevent a reader from recognizing you in the project. I am also committing myself to give you a summary report of the findings of the study. I would be happy to meet you for this interview at a convenient time and place.

I would like to take this opportunity to thank you for your attention. Please do not hesitate to contact me if you have any questions or if you want more information.

Sincerely,

Natalie Durand-Bush, M.A., Ph.D. can

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P.S. I would appreciate it if you could call me collect to inform me of your response.

APPENDIX G – CONSENT FORM FOR ATHLETES

After being informed of the goal of the research project on the development of expert athletes directed by Natalie Durand-Bush,

I consent to participate in this research project and I can withdraw from the study at any time.

I know that in the first part of this research project, I will participate in an interview of approximately 90 minutes long. This interview will take place at a convenient place. If I am asked to participate in the second part of the project, I am free to accept or to refuse. I know that in the second part, I will participate in a concept mapping activity that will last approximately two hours. This activity will also be held at a convenient place at a later time during the study.

I understand that there is no direct benefit to me from participating in this study. I will be sent the original transcript of my interview for verification. A final report of this investigation will be sent to me if I wish to receive one. Also, I understand that a) the results will be kept strictly **confidential** and that my name will not appear in any publications and b) the audiotapes will be erased upon the completion of the study.

If parts of my transcript are appropriate to illustrate the data collected in this study, I give my consent to have them used under the condition that confidentiality and anonymity be safeguarded by the researcher.

Signature of the athlete _____

Signature of the researcher _____

Date _____

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CONSENT FORM FOR PARENTS AND COACHES

After being informed of the goal of the research project on the development of expert athletes directed by Natalie Durand-Bush,

I consent to participate in this research project and I can withdraw from the study at any time.

I know that in this research project, I will participate in an interview of approximately one hour long. This interview will take place at a convenient place. I understand that there is no direct benefit to me from participating in this study. I will be sent the original transcript of my interview for verification. A final report of this investigation will be sent to me if I wish to receive one. Also, I understand that a) the results will be kept strictly **confidential** and that my name will not appear in any publications and b) the audiotapes will be erased upon the completion of the study.

If parts of my transcript are appropriate to illustrate the data collected in this study, I give my consent to have them used under the condition that confidentiality and anonymity be safeguarded by the researcher.

Signature of parent or coach _____

Signature of the researcher _____

Date _____

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**APPENDIX H – DEFINITIONS OF STAGES
OF ATHLETES' DEVELOPMENT IN SPORT**
(Adapted from Côté & Hay, in press)

Level	Definition
Sampling years:	• Participation in a wide variety of sports / activities / games without specialization in one specific area. • Development of fundamental skills and basic identities, motivations, values, and beliefs about sport and physical activity.
Specializing years:	• Focus is on one or two specific sports. • Development of sport specific skills through more structured practice.
Investment years:	• Pursuit of an elite level of performance usually in one particular sport. • Refinement of sport specific skills through extensive structured practice.
Maintaining years:	• Focus is on the maintenance and/or improvement of performance after reaching the highest level in a sport (i.e., Olympic or World Championship title). • Refinement of sport specific skills through extensive structured practice.

**APPENDIX I - LIST OF INDEX CARDS USED FOR
THE CONCEPT MAPPING ACTIVITY**

Context	Athlete Personal Characteristics
Training	Competition
Organization	3. I was involved in community functions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
1. I had good physical characteristics. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	4. I set long-term goals. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
2. I was motivated. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	5. I knew I was special and had something to offer in my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

6. I had good learning abilities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	11. I had innate abilities (natural talent). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
7. I had a strong work ethic. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	12. I was a perfectionist. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
8. I had supportive parents. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	13. I had athletic parents. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
9. My parents introduced me to sports. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	14. My siblings had a positive influence (ex. supportive, learned from them). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
10. Other athletes in my environment had a positive influence (ex. learned from them, good role models). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	15. My coach made training fun. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

16. My coach encouraged me because he/she saw that I had potential. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	21. My friends had a positive influence. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
17. The fact that I grew up in my particular home town was influential in my career. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	22. I enjoyed sports. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
18. I experienced early success in sports. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	23. I participated in a variety of sports. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
19. I started playing organized sports at a young age. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	24. I dropped out of sports at one point in time. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
20. Going to school was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	25. Physical training was important (ex. fitness, weight training, stretching, dry-land activities). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

26. Mental training was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	31. Technical training was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
27. Training was fun. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	32. Training was challenging. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
28. I trained several hours per week. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	33. Training required physical effort and this was important to my athletic development. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
29. Training required concentration and this was important to my athletic development. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	34. Training involved engaging in activities that were aimed at improving my performance. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
30. I enjoyed engaging in effortful activities in training (i.e., required hard work and concentration, could even be painful). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	35. Training camps were important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

36. I experienced success during competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	41. I experienced setbacks (ex. less than optimal performances) during competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
37. Competition was fun. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	42. I enjoyed traveling to and from competitions (ex. car pooling with friends). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
38. I started competing at a young age. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	43. I had the opportunity to compete a lot / play many games. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
39. Environmental conditions during competitions (ex. equipment, facilities) were good. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	44. I was a risk taker. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
40. I enjoyed variety and change. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	45. I had high self-esteem when I was young. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

46. It was important to have familial support. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	51. I had a positive attitude / mindset. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
47. I was confident about my abilities to perform. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	52. I experienced significant improvements during training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
48. My parents respected my personal choices. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	53. I had good communication with my coach. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
49. I had a variety of coaches. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	54. My school teacher had a positive influence. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
50. My teammates had a positive influence (ex. supportive, learned from them). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	55. I had a fitness trainer. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

56. My high school education had a positive influence on my athletic development. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	61. My university education had a positive influence on my athletic development. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
57. I took courses in related fields (ex. physical education, psychology, fitness). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	62. I had financial resources (ex. from parents, sponsors, sport association). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
58. I had access to good facilities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	63. I had access to good equipment. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
59. I narrowed my focus on a few sports. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	64. I had a part-time job. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
60. I trained my sense of awareness (ex. ability to perceive/detect things). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	65. I was mentally tough. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

66. I developed an ability to control distractions in training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	71. I set goals for training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
67. Tactical training was important (ex. developing tactics, strategies). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	72. Training was structured. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
68. Environmental conditions in training were good. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	73. Off-season training was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
69. Testing was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	74. I prepared <u>individually</u> for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
70. My pre-competition preparation included rest activities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	75. I experienced injuries during competition. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

76. Other people's high expectations affected my performance during competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	81. I felt a lot of pressure to perform well during competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
77. I paid attention to my nutrition. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	82. I engaged in activities to let my body rest and physically recover from training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
78. I engaged in activities to allow myself to mentally recover from training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	83. I had good concentration abilities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
79. I knew I was good in my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	84. I knew I could become one of the best in my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
80. I was very competitive. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	85. I was a leader. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

86. I was innovative in my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	91. I was a humble individual. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
87. I had good analytical skills. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	92. My coach was a great motivator. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
88. My coach was demanding. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	93. My coach was knowledgeable. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
89. My partner had a significant influence. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	94. My coach was supportive. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
90. I learned from the scientific community (ex. read about or was involved in research, studied biomechanical or physiological aspects of my sport). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	95. My sport association was a good resource. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

96. My government was a good resource. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	101. I learned from reading books related to aspects of my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
97. I learned from listening to tapes / watching videotapes related to aspects of my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	102. The fact that I continued my education while I pursued my sport had a positive influence. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
98. I made the national team. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	103. My sport became the main focus in my life. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
99. I developed imagery / visualization skills. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	104. I developed an ability to analyze / evaluate my performances in training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
100. I engaged in activities such as meditation, Zen, or hypnosis. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	105. I was intuitive / relied on my instincts. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

106. I simulated aspects of competitions during training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	111. The quality of my training was important. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
107. I experienced setbacks during training. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	112. Training was intense. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
108. My training activities were varied. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	113. Training was regimented. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
109. Training activities were repetitious (ex. followed a routine). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	114. I engaged in extra training activities to improve my performance. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
110. I approached competitions with a positive mindset. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	115. I approached competitions with a sense of perspective. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

116. I followed a routine to prepare for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	121. I engaged in positive self-talk to prepare for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
117. I relaxed before competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	122. I engaged in imagery / visualization to prepare for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
118. I focused when preparing for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	123. My preparation for competitions involved team activities (ex. meetings, meals, pep-talks, warm-up). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
119. My preparation for competitions involved physical activities (ex. tapering, morning practice, warm-up). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	124. I followed a routine between my events (ex. between games, races, runs). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
120. My competitors had a positive influence (ex. learned from them, were positive rivalries). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	125. I experienced pressure from the media at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

126. I experienced stress / anxiety at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	131. Having experience was important at competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
127. I had fun at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	132. I was emotional at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
128. I experienced pressure from my family/friends at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	133. I experienced pressure from my sport association/government at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
129. I loved nature / the outdoors. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	134. I focused on the process of performance at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
130. I experienced success at important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	135. I had peak performances. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

136. I evaluated my successful performances (ex. wins) after competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	141. I was involved in the organization for competitions (ex. team or individual tasks, training schedule, sleeping arrangements). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
137. I was involved in the business of my sport (ex. getting sponsors, hiring staff members, organizing for transportation and equipment). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	142. I engaged in activities outside of my sport to maintain some balance in my life (ex. friends, hobbies). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
138. I was passionate about my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	143. I was driven to succeed in my sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
139. I kept a training / competition log. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	144. I experienced a need to learn something new every day. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
140. I had religious faith. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	145. I worked with a mental training / performance enhancement consultant. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

146. I moved to another city to train. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	151. I had to limit the information I shared with others in order to avoid getting copied by competitors. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
147. I was overtrained. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	152. I developed refocusing abilities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
148. I participated in team building activities. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	153. I centralized to train for important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
149. I performed consistently at important competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	154. I felt at peace / comfortable before competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
150. I psyched myself up to prepare for competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	155. My individual preparation for competitions was consistent. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

156. I was able to refocus under distractions during important competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	161. I experienced early success in my chosen sport. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
157. I had a full-time job. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	162. I engaged in activities to let my body physically recover from competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
158. I engaged in activities to allow myself to mentally recover from competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	163. I evaluated undesirable performances (ex. losses) after competitions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
159. I took responsibility for my own actions. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	164. My preparation for competitions involved scouting my environment ahead of time. Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7
160. I experienced pressure from the media <u>after</u> important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7	165. I experienced pressure from the public <u>after</u> important competitions (ex. Olympics, World Championships). Development of performance 1 2 3 4 5 6 7 Maintenance of performance 1 2 3 4 5 6 7

APPENDIX J – CAREER TRAJECTORIES OF ATHLETES

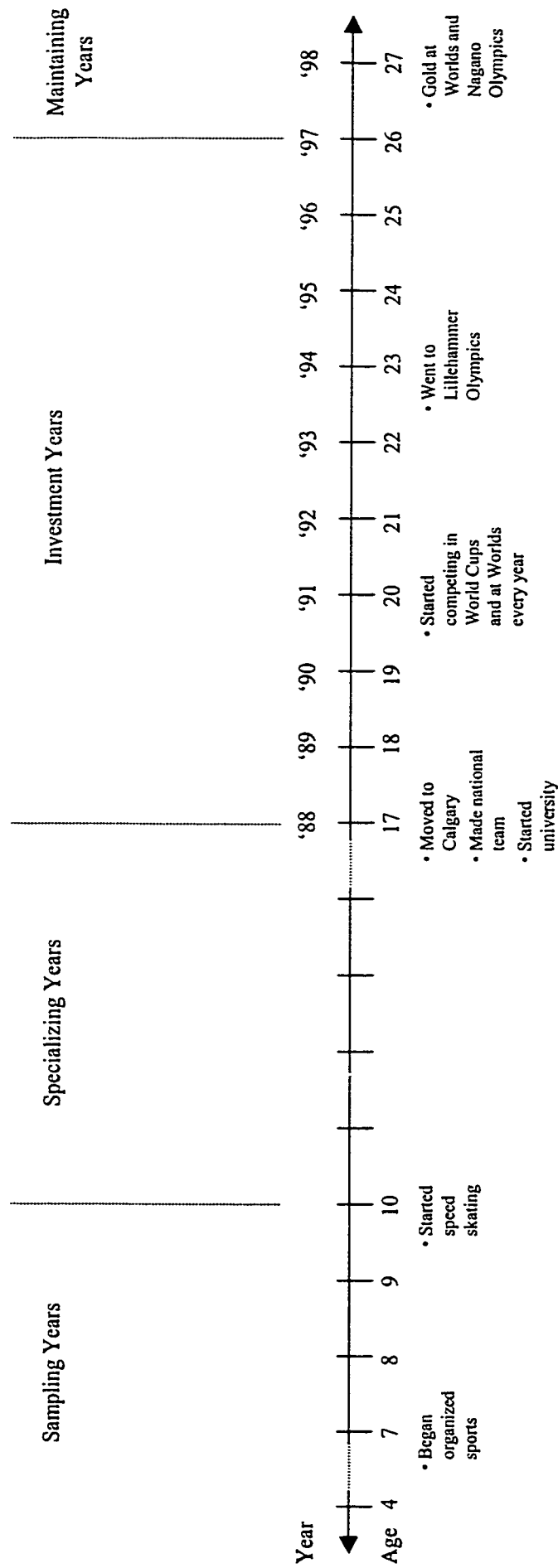


Figure 4. Career trajectory of CI

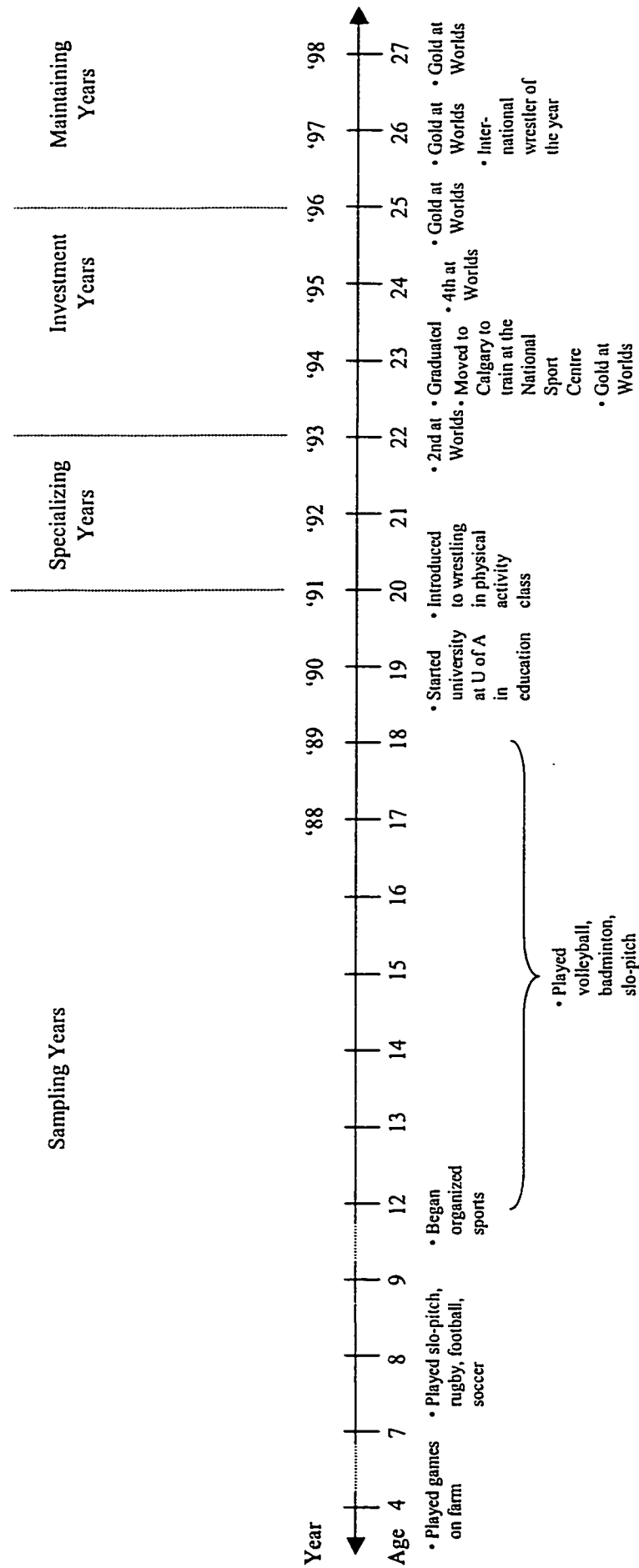


Figure 5. Career trajectory of C2

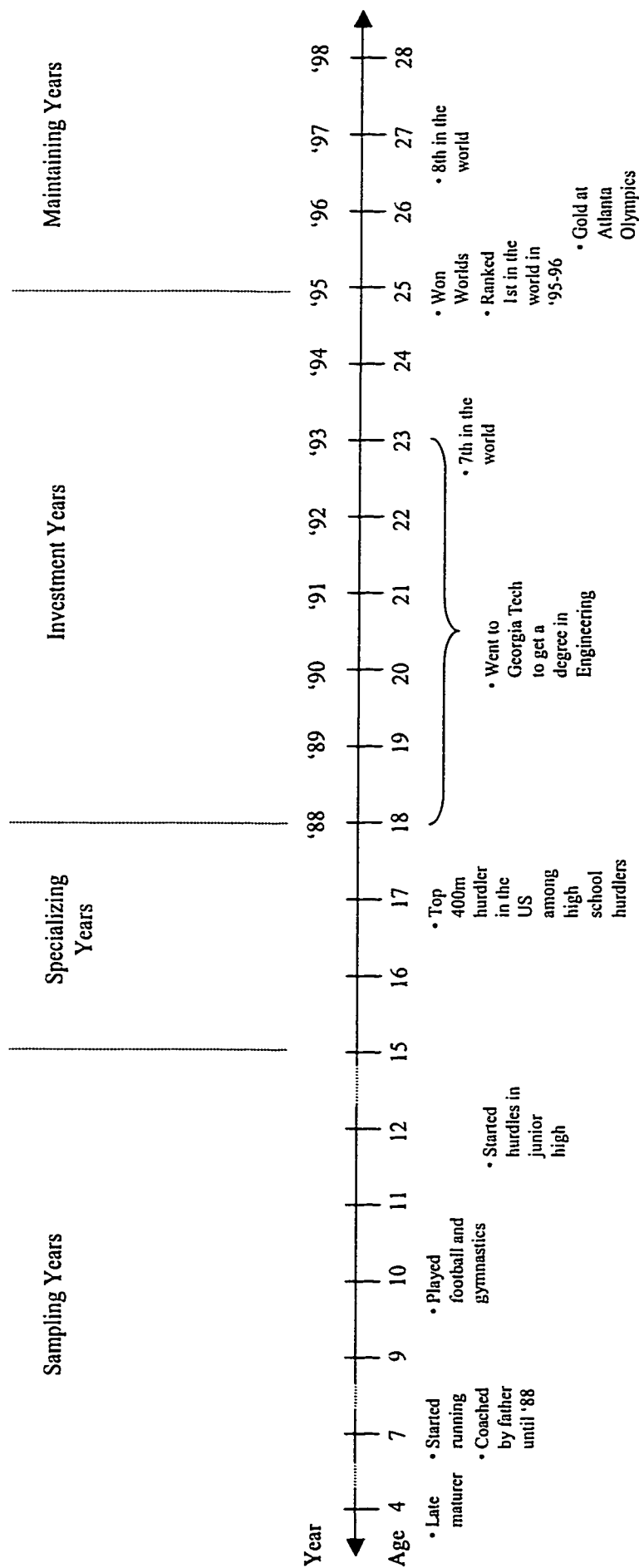


Figure 6. Career trajectory of C3

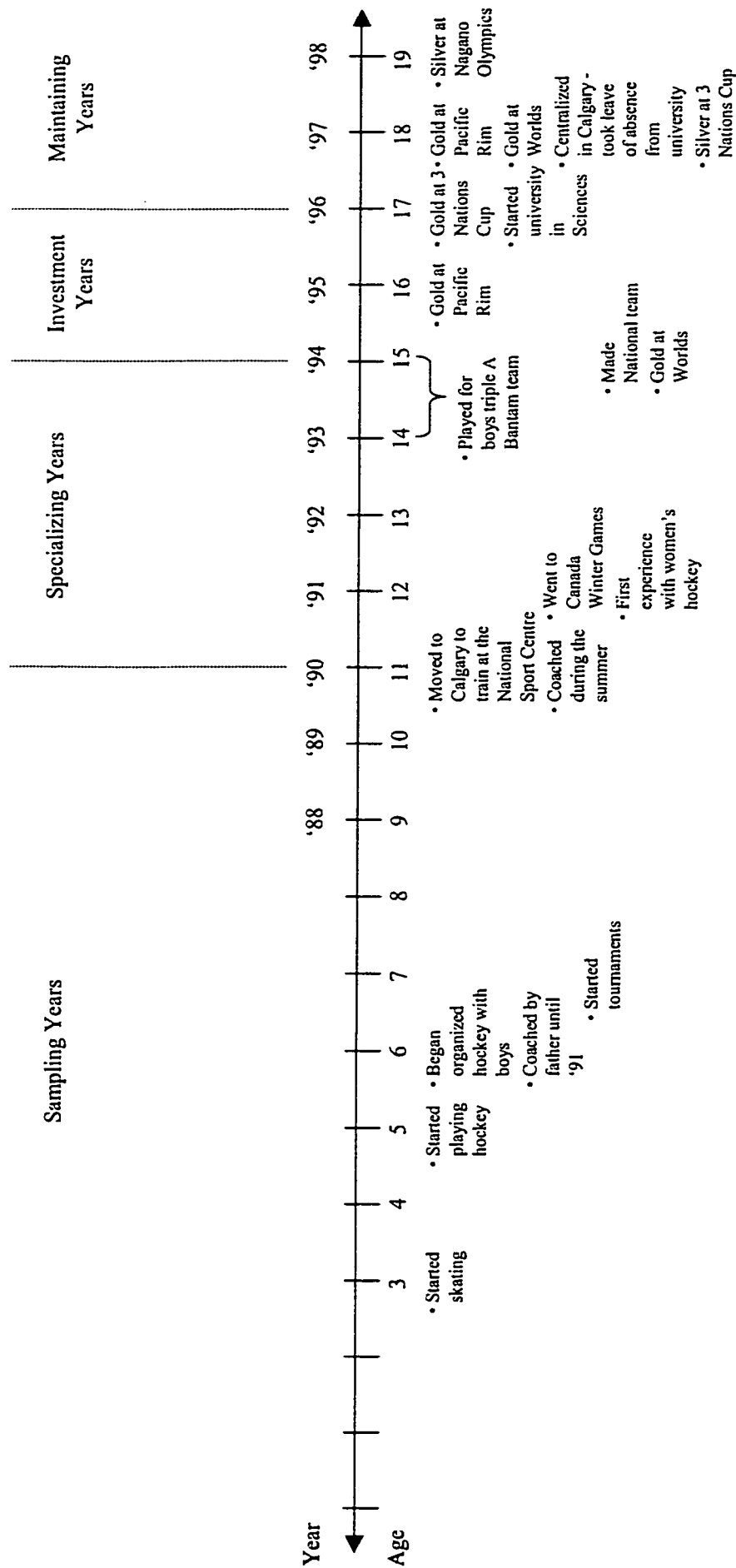


Figure 7. Career trajectory of C4

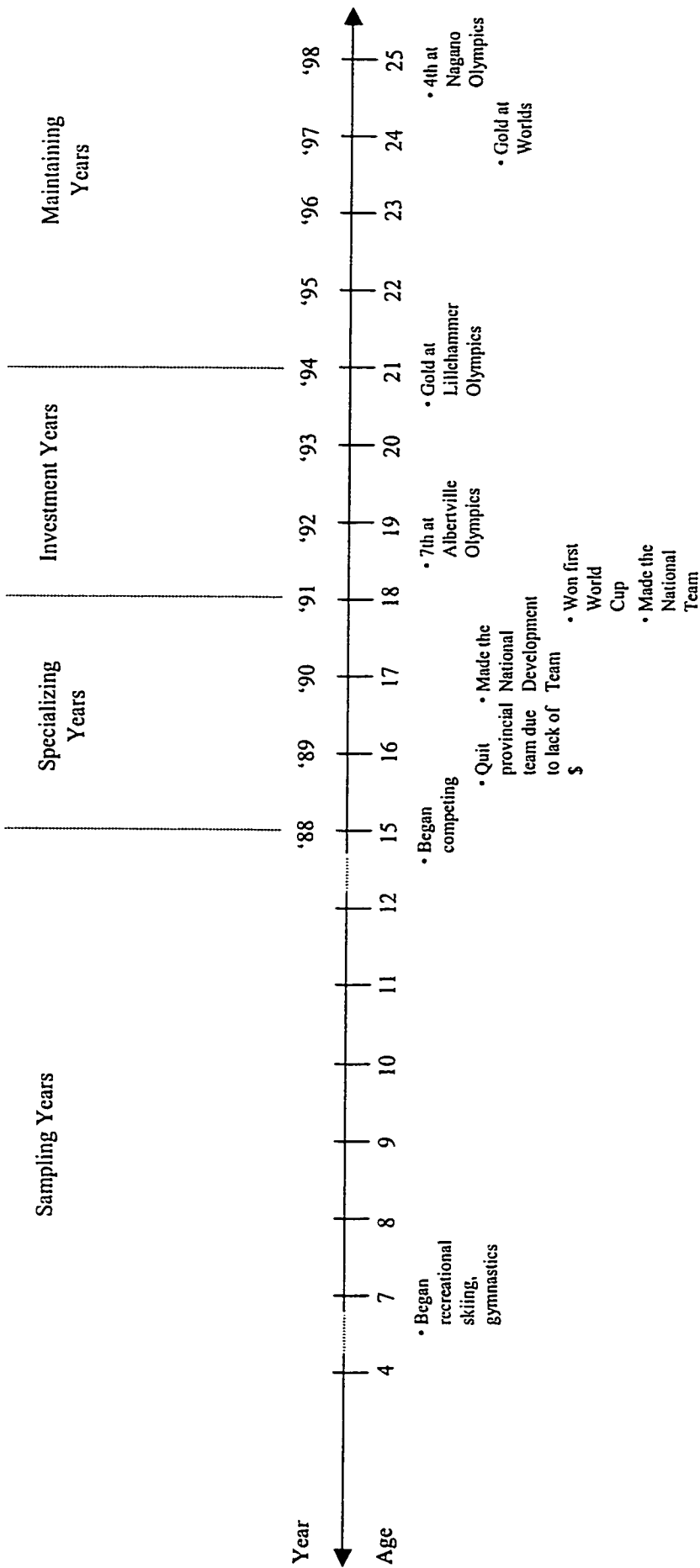


Figure 8. Career trajectory of C5

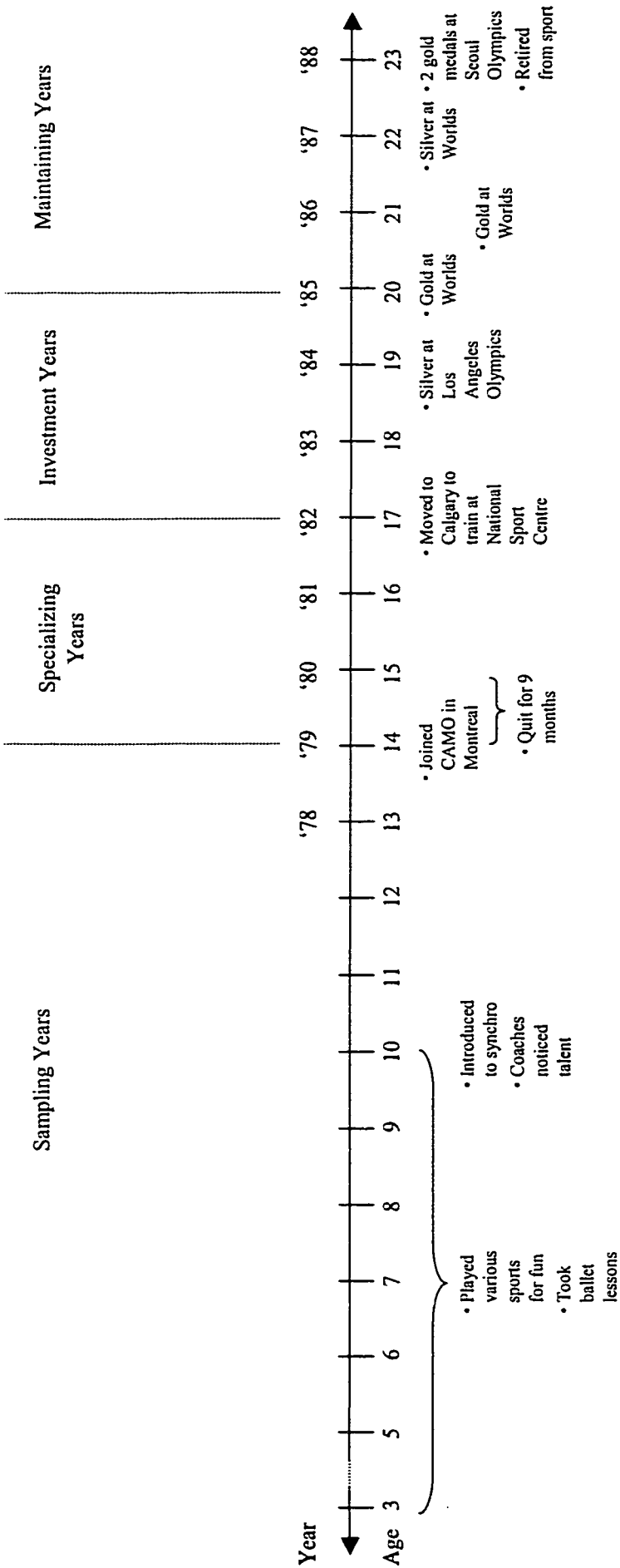


Figure 10. Career trajectory of R1

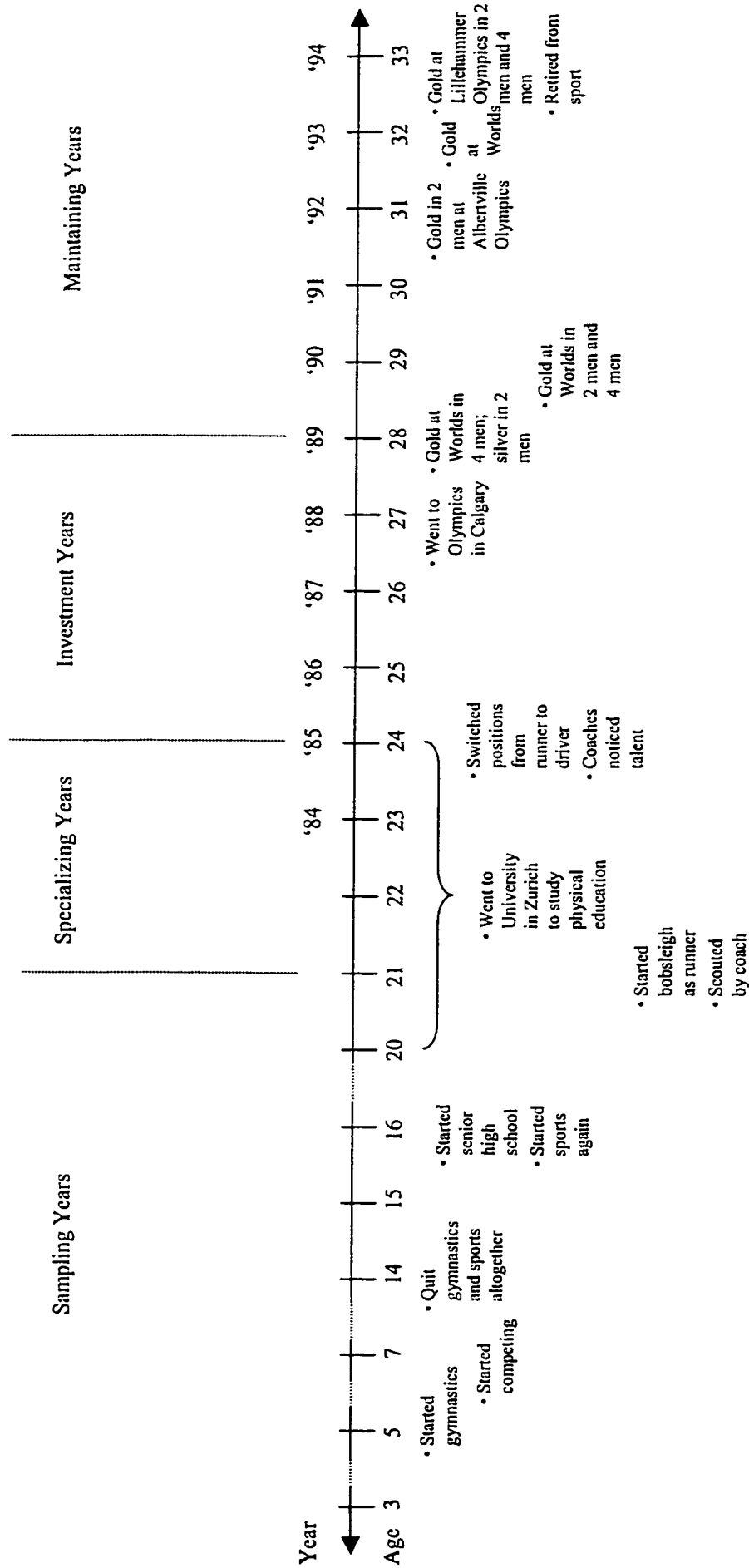


Figure 11. Career trajectory of R2

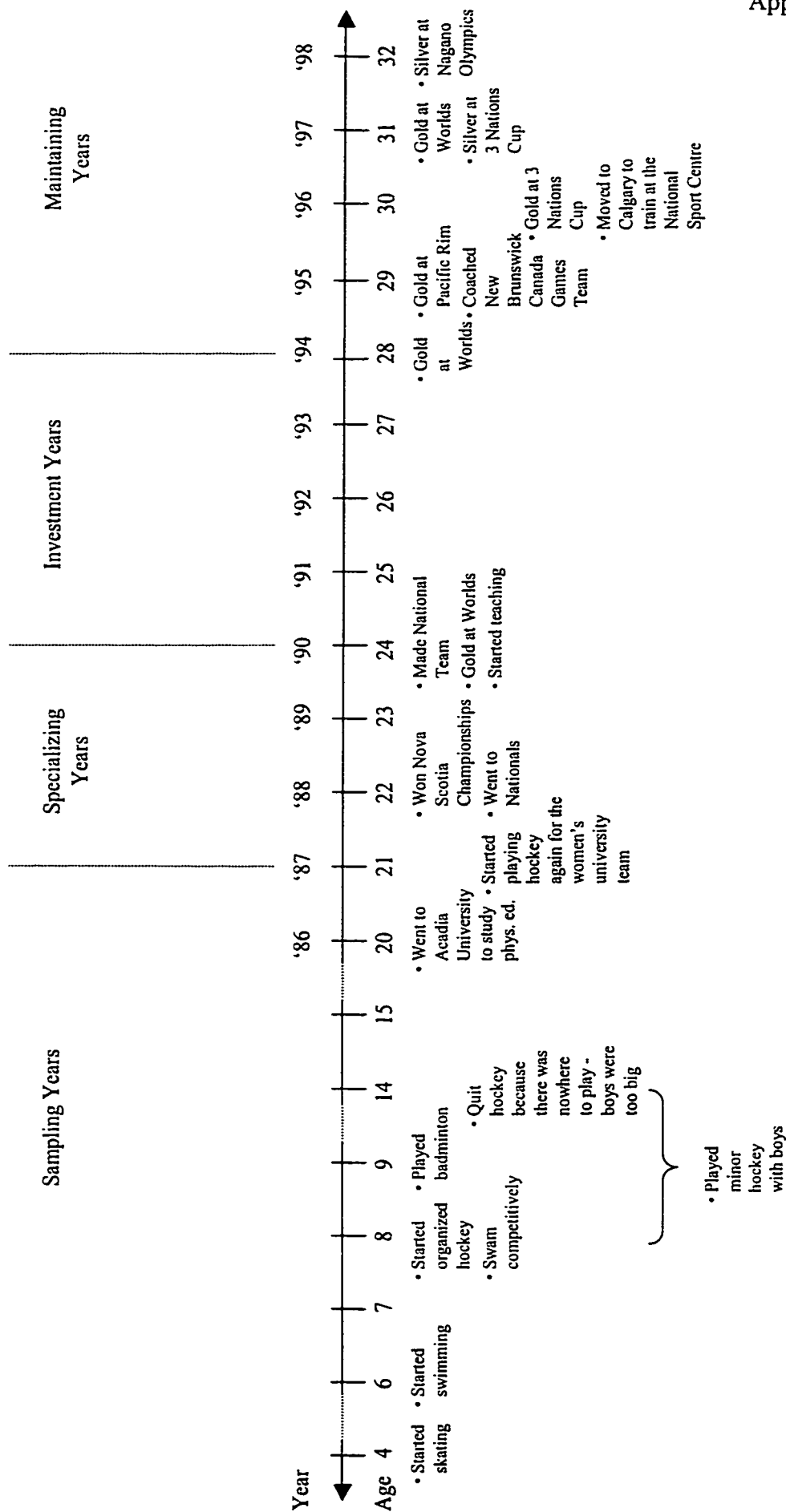


Figure 13. Career trajectory of R4

APPENDIX K – CHECK LIST USED TO ENHANCE TRUSTWORTHINESS
(Miles & Huberman, 1994)

What was stored, retrieved, and retained

1. Raw material: field notes, tapes, index cards.
2. Partially processed data: print-outs of transcribed interviews. Both initial versions, and subsequent corrected, “cleaned,” “commented-on” versions were kept in files.
3. Coded data: print-outs with specific codes attached.
4. The coding scheme (index tree in NUDIST 4.0).
5. Memos and other analytic material: personal reflections on the conceptual meaning of the data.
6. Search and retrieval records: reports of coded meaning units.
7. Data displays: figures and tables used to display information in a more visual and organized form.
8. Analysis episodes: log of what I did to develop the figures and tables and write the analytic text.
9. Report text: successive drafts of what I wrote on the design, methods, and findings of the study.
10. General chronological log of the data collection and analysis work.

APPENDIX L – TRAINING SCHEDULE OF ATHLETES

Table 11

Training Schedule During Different Stages of the Athletes' Career

Athlete	Stage			
	Sampling Years	Specializing Years	Investment Years	Maintaining Years
C1	played various sports	2 hours per evening - played various sports	- trained 3-4 hours per day for 5 consecutive days, then had a day off - trained 2x per day; on-ice and off-ice program - total of 8 hours per day with extras	same as investment years
C2	no formal training yet but played other sports (i.e., volleyball) and wrestled for fun with friends and siblings	- trained 3x per week, 2 hour practices - weight training 3x per week	2 hours per day, 5 days per week - weight training 4x per week + individual cardio work	same as investment years
C3	- trained 3x per week - track meets every weekend	----	approx. 3 hours per day, including weights, 5 consecutive days per week, then had 2 days off	same as investment years

Table 11 (continued)

Athlete	Stage			
	Sampling Years	Specializing Years	Investment Years	Maintaining Years
C4	• 1.5 hours per day, 3 days per week • 3-4 games per week • about 8.5 hours of ice-time per week	• 20 hours per week (hockey) • 30 hours altogether with basketball and volleyball	• 3-4 hours on-ice per day, then off-ice session in weight room • 30-40 hours per week	• when centralized, 8 hours per day (including on and off-ice sessions), Monday to Saturday and had Sundays off
C5	• no formal training yet but skied every weekend for about 24 hours	• skied every weekend for over 24 hours • 1 hour of physical training per evening	• 4 hours per day, 4-5 days per week during ski season • 2-3 hours per day during summer	• same as investment years (took a break and reduced number of hours in '97, between '94 and '98 Olympics)
C6	• 3-4 hours of ice-time per week, including practices, goalie school, and games	• on the ice 5-6x per week, including games • off-ice training started in '93	• same as specializing years	• 1.5-2 hours on ice, 1.5-2 hours off ice, 5-6 days per week
R1	• 1 synchro lesson per week for ½ hour	• by age 15, trained 4 hours per day	• 6-8 hours per day, 6 days per week	• same as investment years

Table 11 (continued)

Athlete	Stage			
	Sampling Years	Specializing Years	Investment Years	Maintaining Years
R2	not introduced to bobsleigh yet but trained for gymnastics and track and field	trained 4-5 hours per day, including track and field and other sports played at school	- did 2-3 runs per day as often as he could 1 weight lifting workout per week, maximum 1 hour	same as investment years
R3	1-1.5 hours per workout, 4-5x per week = 7-8 hours per week (9 years of age)	1.5-2 hours per workout, 6-9x per week = 15-18 hours per week (12 years of age)	2-2.5 hours per workout, 9x per week + 6-7 hours per week dry-land activities 25-30 hours per week in total	same as investment years (took a break and reduced number of hours in '93, between '92 and '96 Olympics)
R4	1 hour per practice, 1x per week 2 games per week (1-1.25 hours each) + tournaments (2-4 games) - about 3-4 hours of ice-time per week	1 hour per practice, 2x per week - tournaments on weekends (2-4 games) 3rd and 4th year university -- trained 1-2 hours per day for badminton	1.5-2 hours per day, 5x per week - tournaments on weekends (2-4 games)	1.5-2 hours on ice, 1.5-2 hours off ice, 5-6 days per week