INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

UMI

A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor MI 48106-1346 USA
313/761-4700 800/521-0600

Université d'Ottawa · University of Ottawa

TOWARDS A MOTIVATIONAL MODEL OF FLOW

by

© John Kowal

Thesis Submitted to
the School of Graduate Studies and Research
in Partial Fulfillment of the Requirements for the Degree of
Master of Arts in Human Kinetics

School of Human Kinetics
University of Ottawa
Ottawa, Canada
1998

ACKNOWLEDGEMENTS

There is no precedent for your life.

I would like to take this opportunity to acknowledge and thank a number of special people who have walked with me on what has been a masterful journey. You have all contributed, in your own unique and often unseen ways, to a most meaningful, unforgettable, and enriching experience.

First and foremost, I would like to thank my supervisor, boss, and chef, ***Dr.*** Michelle Fortier. J'apprécie infiniment ta générosité et l'effort que tu as toujours fait. Je suis très fier de t'avoir comme superviseure de thèse et comme amie.

A big thank you also goes out to the two members of my thesis committee, Dr. Luc Pelletier and Dr. Pierre Trudel. You have both been instrumental in my development as a scholar and more importantly, as a person. C'était un vrai plaisir d'avoir eu l'occasion de travailler avec vous.

To my family, who has provided me with a never-ending source or support, I extend my sincerest thanks and praise.

For my soul brother, J. Thomas Brett II, thank you for cultivating the seed of potentiality. Your friendship, insight, and sagicity have always been a guiding light. As you well know and undoubtedly understand, *the ripened fruit falls effortlessly from the tree.*

There are also a number of distinguished individuals who have helped create, shape, and, construct my experience into something exceptional. I would like to say a jocular and gargantuan thank you to Wade, Patty, Theresa, Mathieu, Rebecca, Suzy-Q, Lori, Sylvain, Carole, Karrie and Mark. The simplicity and profoundness of connection cannot be understated. De plus, j'aimerais

remercier Lise O'Reilly pour son ingéniosité administrative!

Finally, I would like to dedicate this thesis to anyone who has ever been told they would never be able to do *it*. For those who have ever fathomed this thought, I would like to say, yes, IT is possible. I know. I did it.

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The purpose of this thesis was to examine the relationship between motivation and flow. As a conceptual framework for investigating motivation, Vallerand's (1997) Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM) which is based predominantly on Deci and Ryan's Self-Determination Theory (Deci & Ryan, 1985, 1991) was used. The work of Csikszentmihalyi (1975a, 1991) served as a theoretical basis for examining the flow state. Canadian master's level swimmers completed questionnaires on two separate occasions, Time 1 (n = 203) and Time 2 (n = 104). At Time 1, situational measures of distal motivational determinants (perceptions of success and perceptions of the motivational climate), proximal motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness), self-determined motivation, and flow were assessed immediately following a swim practice. Contextual measures of these same variables were assessed at Time 2 (one week later) with the exception of flow. Two sets of analyses were then conducted in order to examine the links between these motivational concepts and flow. In the first set of analyses (Article 1), the relationships between different forms of situational motivation (intrinsic motivation, self-determined extrinsic motivation, non self-determined extrinsic motivation, and amotivation) and flow as well as between situational motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness) and the experience of this psychological state were examined (n = 203 swimmers). Analyses of variance between high-and low incidence of flow groups and correlations were used to assess these links. Results revealed that situational self-determined forms of motivation (intrinsic motivation and self-determined extrinsic motivation) as well as perceptions of autonomy, competence, and relatedness were positively related to flow,

whereas amotivation was negatively related to this psychological state. In the second set of analyses (Article 2), a more complex Motivational Model of Flow was proposed and tested based on Vallerand's HMIEM (n = 104 swimmers). Results of a path analysis supported a number of links in the hypothesized model and demonstrated that situational self-determined motivation was a salient predictor of the flow state. Findings from both sets of analyses are discussed in light of research and theory on motivation and flow, a number of practical implications are outlined, and directions for future research are proposed.

CHAPTER I

INTRODUCTION

Investigating subjective human experience has recently emerged as a focal point in contemporary sport and exercise psychology. This line of inquiry has long been overlooked due to an emphasis on competitive and behavioural outcomes (Jackson, 1993; Kimiecik & Stein, 1992). An ever-increasing number of researchers and practitioners have, however, recognized the importance of subjective experiences, particularly as they pertain to issues of health, well-being, and quality of life. In an age where contemporary sport is seemingly plagued by an overbearing cloud of violence, corruption, and scandal, research into positive subjective experience is a welcome reminder of one of the numerous benefits participation in sport and physical activity can bring.

One subjective human experience that has been closely examined over the past two decades is a positive psychological state known as *flow* (Csikszentmihalyi, 1975a, 1990). This highly enjoyable experiential state refers to the "holistic sensation that people feel when they act with total involvement (in an activity)" (Csikszentmihalyi, 1975b, p. 36). Research by Csikszentmihalyi and others (e.g., Jackson & Marsh, 1996) has identified a number of characteristics of the flow state including concentration on the task at hand, a merging of action and awareness, a sense of control over oneself and/or the environment, a transformation of time, and the existence of a balance between the perceived skills of the individual and the perceived

challenges of the situation. The vast majority of empirical research on flow has been descriptive in that it has examined the phenomenology of this psychological state across a multitude of settings including work and leisure (Csikszentmihalyi, 1975a; Csikszentmihalyi & LeFevre, 1989; Wells, 1988), education (Carli, Delle Fave, & Massimini, 1988; Csikszentmihalyi, Rathunde, & Whelan, 1993; Larson, 1988; Nakamura, 1988), and sport and physical activity (Grove & Lewis, 1996; Jackson, 1992, 1995; Jackson & Roberts, 1992; Stein, Kimiecik, Daniels, & Jackson, 1995). This has resulted in the generation of a comprehensive body of knowledge with respect to the characteristics of flow, however, it has provided mere clues regarding how flow states occur.

More contemporary research in this area has examined antecedents of flow (Jackson, 1995; Stein et al., 1995). One particular variable that has emerged as an important precursor to this psychological state is motivation. In a cross-cultural qualitative investigation, Massimini, Csikszentmihalyi, and Delle Fave (1988) found that intrinsic motivation was believed to facilitate flow. Similarly, in a qualitative study conducted with elite athletes, Jackson (1995) found motivation to be a variable believed to promote athletes' experience of the flow state.

The importance of motivation to the experience of flow has also been demonstrated in a number of studies in which the link between these constructs has been assessed. In a study conducted in a work and leisure setting, Csikszentmihalyi and LeFevre (1989) found intrinsic motivation to be positively associated with flow. This relationship was also supported by Haworth and Hill (1992) in a study conducted with adult office workers and by Graef, Csikszentmihalyi, and McManama-Gianinno (1983) in a leisure study.

In the context of sport and exercise psychology, Jackson and Roberts (1992) provided additional support for the positive link between motivation and flow. Using Goal Perspective

Theory (GPT - see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) as a theoretical basis for examining the relationship between these variables, it was found that a task-involved goal orientation (a motivational orientation towards improving one's level of skill or mastering a given task) was significantly and positively related to the experience of flow.

While GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) has been used to examine the relationship between motivation and flow, no study to date has assessed this link using Self-Determination Theory (SDT - Deci & Ryan, 1985, 1991). SDT would appear to be salient in this regard given that it distinguishes between different forms of motivation based on the degree to which they can be considered self-determined. By doing so, SDT allows for a further refinement of the intrinsic/extrinsic or task/ego dichotomies that categorize motivation into one of two types. Moreover, SDT describes motivation as a process beginning with determinants and ending with consequences. This determinants --> motivation --> consequences sequence is highly useful because it allows for a detailed examination of the psychological processes underlying important phenomena such as flow. Finally, SDT has been recently used to assess a number of motivational outcomes such as positive emotions (Frederick, Manning, & Morrison, 1996), persistence (Fortier & Grenier, in press; Pelletier, Fortier, Vallerand, & Brière, 1997; Vallerand, Fortier, & Guay, 1997), and sportsmanship attitudes (Vallerand & Losier, 1994) and can likewise be used to examine flow.

Recently, Vallerand (1997) proposed a Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM) based on SDT (Deci & Ryan, 1985, 1991) as well as past research on motivation (e.g., Csikszentmihalyi & Nakamura, 1989; Harter, 1978; Lepper & Greene, 1978). This theoretical model posits that three main types of motivation exist (intrinsic motivation,

extrinsic motivation, and amotivation), that they are present at three different levels of generality (global, contextual, and situational), that they are influenced by specific determinants, that they lead to various outcomes, and that the different levels are interrelated. The HMIEM is germane for examining the flow state since it allows for specific hypotheses regarding the relationship between motivation and flow to be tested in an empirically verifiable framework.

Accordingly, the purpose of this thesis was to examine the relationship between motivation and flow based, in part, on the theoretical tenets underlying the HMIEM (Vallerand, 1997). This was done using a two-wave time-lagged design in which situational variables were assessed at Time 1 and contextual variables were measured at Time 2 (one week later). Two sets of analyses were then conducted. In the first, the relationship between different forms of situational motivation, situational motivational determinants, and flow was assessed. In the second set of analyses, a more complex Motivational Model of Flow was proposed and tested using both situational and contextual variables.

This thesis has been written by article format and is comprised of two journal articles, *Motivational Determinants of Flow: Contribution from Self-Determination Theory* and *Towards a Motivational Model of Flow: Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation*. Both articles are based on the single aforementioned study which was conducted in the context of master's level swimming. Article 1 is based on the first set of analyses, whereas Article 2 is based on the second.

Organization of the Remainder of this Thesis

The remainder of this thesis is organized into four chapters. In the next chapter (Chapter II), a comprehensive literature review on motivation and flow is presented. Chapter III includes

the two journal articles that have been prepared for submission to academic journals. These manuscripts are proffered in the form required by scholarly publications. It is important to mention that at the time of the deposition of this thesis, Article 1 has been accepted for publication in the *Journal of Social Psychology* and Article 2 will soon be submitted. In Chapter IV, a general discussion of the two journal articles and an overall conclusion are presented.

A number of appendixes are also included in this thesis. In Appendix A, the relative contributions of the two authors listed on the journal articles is detailed. Appendix B is comprised of supplementary statistical information and analyses that were added following recommendations made at the thesis defence by the two committee members, Dr. Luc Pelletier and Dr. Pierre Trudel. The situational and contextual questionnaires used in this research project are contained in Appendix C and Appendix D, respectively. Finally, the documentation outlining the ethics approval for this study is included in Appendix E.

CHAPTER II

LITERATURE REVIEW

This chapter has been organized into two main sections. The first focuses on motivation and begins with a general overview of this topic. This is followed by a discussion of two contemporary motivational theories that have been widely used in research on sport and physical activity, namely, GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) and SDT (Deci & Ryan, 1985, 1991). Vallerand's (1997) Hierarchical Model of Intrinsic and Extrinsic Motivation is then presented. The second section of this chapter consists of a literature review on flow. It begins with a comparison of three closely related constructs, namely, flow, peak experience, and peak performance. This is followed by a description of the individual flow characteristics. A discussion of the relationship between motivation and flow is then detailed. Finally, the purpose and significance of this thesis are presented.

The Inquiry into Human Motivation

The inquiry into human motivation is a road much travelled. This has been particularly true in the field of sport and exercise psychology where motivation has been a topic of study for several decades (see Thill & Vallerand, 1995; Roberts, 1992a; Vallerand, Deci, & Ryan, 1987). In the context of sport and physical activity, people's motives for engaging in activities are not always evident nor are they easily understood. For example, why do certain individuals invest thousands of hours of time and energy into seemingly pointless activities that provide little, if any, material benefit? What inspires athletes to devote themselves so passionately to physical training regimes that they literally work to the point of exhaustion? Or, why do scores of people begin fitness classes only to drop-out at alarming rates? The answers to such questions lie at the heart of human motivation.

As a construct, motivation attempts to explain the "why" of human behaviour and has been defined as the internal and/or external forces that are responsible for the initiation, direction, intensity, and persistence of behaviour (Vallerand & Thill, 1993a). This definition is particularly useful because it accounts for several key concepts that are central to the understanding of behaviour and illustrates how motivation is very much dependent upon the interaction between an individual and the environment. Motivation can thus be considered the sum total of forces that affect and effect behaviour.

The Evolution of Motivational Theory

The number of motivational theories that have endeavoured to explain the processes underlying human behaviour have been plentiful (see Petri, 1996; Vallerand & Thill, 1993b). According to researchers such as Deci and Ryan (1985, 1991) and Roberts (1992b), this myriad of theories may be situated along a continuum ranging from mechanistic at one extreme to organismic/cognitive at the other.

Mechanistic motivational theories were popular during the earlier part of this century and were characterised by the belief that human beings are inherently passive organisms whose motivation can be explained from the vantage point of underlying psychological drives (e.g., Hull, 1943). More specifically, motivation was described in terms of an individual's desire to reduce or satisfy innate, internal drives. This approach, while useful for explaining behaviour under the controlled conditions of laboratory settings, was eventually rejected by theorists who did not subscribe to the view that human beings were inherently passive (e.g., Bandura, 1977, 1986; Deci, 1975; Harter, 1978; Heider, 1958; Rotter, 1954; White, 1959). Instead, these researchers viewed humans as active agents capable of initiating action from within, that is, in an autonomous

or self-determined manner. From the vantage point of organismic/cognitive theorists, beliefs, needs, cognitions, and/or goals are considered central to the study of motivation.

A multitude of sub-theories may be classified under the general guise of this organismic/ cognitive perspective. However, for the sake of this thesis, the ensuing discussion will be limited to two organismic/cognitive theories that have been popular in contemporary research on sport and exercise psychology literature, namely, Goal Perspective Theory (GPT - see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) and Self-Determination Theory (SDT - Deci & Ryan, 1985, 1991).

Goal Perspective Theory

GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) is a social-cognitive motivational theory based primarily on a conception of goals. From this perspective, human behaviour is posited to be goal-directed and as such, motivation is explained in terms of the goals individuals pursue in their interaction with the environment. In this regard, the environment may take any number of forms including sport and physical activity settings.

Goal-Orientations

Two basic goal-orientations have been identified within the framework of GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a), namely, ego-involved and task-involved[1] (see also Ames & Archer, 1988; Dweck, 1986; Dweck & Elliot, 1983; Maehr, 1984). Individuals with an ego-involved goal-orientation measure their ability or performance relative to

---

[1] It is important to note that the terminology used to describe the two goal-orientations varies considerably from researcher to researcher (see Duda, 1992; Roberts, 1993 for a more detailed explanation). For the sake of clarity, the terms *ego-involvement* and *task-involvement* will be used throughout this thesis.

others. As such, their success is normatively referenced. The primary reason why ego-involved individuals engage in activities is to surpass the accomplishments of others who are perceived as competitors. By way of contrast, individuals with a task-involved goal-orientation are concerned primarily with participating in activities in order to improve skills, master tasks, or derive enjoyment from their experience. Task-involvement is based on the premise that perceptions of ability are self-referent and not contingent upon social comparisons. Success is therefore measured relative to past performance or one's previous level of ability.

Researchers adopting this theoretical perspective suggest that the development of a particular goal-orientation is a function of individual differences and situational factors (Ames, 1984, 1992; Roberts, 1992b; Nicholls, 1989). Individual differences refer to one's disposition or preference for adopting a particular goal-orientation and are based largely on perceptions of ability. Situational factors, on the other hand, refer to the goal structure that is rewarded, punished, encouraged, or discouraged. The goal structure has also been referred to as the *motivational climate.*

The Motivational Climate

Two basic motivational climates have been identified in the literature, namely, a *mastery motivational climate* and a *performance motivational climate* (Ames 1984, 1992; Ames & Archer, 1988). Similar to task-and ego-involved goal perspectives, a mastery motivational climate is characterised by an emphasis on learning, mastering tasks, or participation in the activity. A performance motivational climate is characterised by an emphasis on competition and comparing one's ability with others. The motivational climate is created by social influences (e.g., parents, teachers, and coaches) through the goal structure that is encouraged, reinforced, and/or imposed.

Research on academic achievement has suggested that the way in which students perceive the motivational climate is linked to their attitudes towards learning. For example, Ames and Archer (1988) found high school students who perceived their class as being mastery oriented demonstrated more effective learning strategies, showed a preference for challenging tasks, and tended to believe that academic success resulted from effort. Conversely, high school students who perceived their class as being performance oriented tended to believe that academic failure resulted from lack of ability and perceived themselves as less competent. Similar results were obtained by Ames (1992) in a study conducted with elementary school children.

The relationship between perceptions of the motivational climate and a battery of motivational variables has also been assessed in a number of recent studies on sport and physical activity. In an investigation carried out by Seifriz et al. (1992), the influence of contextual[2] goal-orientations and situationally induced motivational climate (goal structure) on state measures of intrinsic motivation was examined in the context of high school basketball. Results indicated that both goal-orientations and the motivational climate were positively related to state enjoyment and intrinsic motivation. In a similar investigation conducted with female volleyball players, Newton (1994) found perceptions of the motivational climate to be positively linked with measures of intrinsic motivation and team satisfaction.

Motivational Outcomes

As a theoretical framework, GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989;

---

[2] The term *contextual* is used here and throughout this thesis in reference to a general orientation or disposition. While a number of authors have employed the term *dispositional* in an analogous fashion. For the sake of the present document, these two terms should be considered synonymous.

Roberts, 1992a) also accounts for the manner in which different goal-orientations lead to various outcomes. Specifically, a task-involved goal-orientation has been linked to desirable outcomes such as persistence, higher levels of performance, personal satisfaction, and intrinsic interest in the activity, whereas an ego-involved goal-orientation has been associated with less desirable outcomes such as attrition, lack of interest, and dissatisfaction (see Duda, 1989, 1992; Nicholls, 1989, 1992; Roberts, 1993). Empirical research in the context of sport and physical activity settings have supported these findings. For example, task-involvement was found to be positively related to enjoyment and interest in an activity (Duda, Chi, & Newton, 1990; Seifriz et al. 1992), social responsibility and lifetime health (Roberts, Hall, Jackson, Kimiecik, & Tonymon, 1990), satisfaction (Walling, Duda, & Chi, 1993), effort exerted (Duda, 1988; Duda, Smart, & Tappe, 1989), as well as the experience of positive psychological states and peak athletic performances (Jackson & Roberts, 1992). By way of comparison, ego-involvement has been positively linked to reduced effort (Duda & Chi, 1989; Hall, 1989) and dropout (Duda, 1988). In sum, GPT has been instrumental in forwarding an understanding of motivation towards sport and physical activity and continues to gain acceptance in this domain.

Self-Determination Theory

Another contemporary motivational theory that has been widely used over the course of the past decade is Deci & Ryan's (1985, 1991) SDT. This motivational theory originated from the work of distinguished scholars such as deCharms (1968), Deci (1975), Maslow (1943), and White (1959). The basic premise underlying SDT is that motivation stems from three fundamental psychological needs for *autonomy*, *competence*, and *relatedness*. According to Deci and Ryan, the manner in which individuals interact with the environment is a function of their striving to

fulfil these three innate needs.

SDT (Deci & Ryan, 1985, 1991) is germane for examining human motivation for a number of reasons. First, it accounts for the initiation or energization of behaviour. By explaining motivation in terms of fundamental psychological needs, SDT can be used to make specific predictions regarding factors or determinants that influence motivation. Second, SDT distinguishes amongst different forms of motivation and classifies these forms based on the degree to which they can be considered self-determined. By classifying motivation in this way, SDT allows for a further refinement of the intrinsic/extrinsic or task/ego dichotomies that necessitate a categorization of motivation into one of two basic types. Accordingly, a more complete and comprehensive understanding of motivation can be ascertained. Third, Deci and Ryan's approach accounts for motivational consequences. As a result, specific predictions can be empirically verified with respect to motivational outcomes. Finally, SDT has proven to be a valuable approach to understanding the complexities of motivation in the context of sport and physical activity (see Deci & Ryan, 1985, chapter 12; Frederick & Ryan, 1995; Vallerand, 1993; Vallerand et al. 1987 for reviews). In short, SDT provides a integrative framework for examining the multitude of variables that influence or are influenced by motivation.

While SDT is typically used as the umbrella term to describe Deci and Ryan's (1985, 1991) theoretical perspective to the study of motivation, it is actually composed of two sub-theories: *Organismic Integration Theory* (OIT) and *Cognitive Evaluation Theory* (CET)

Organismic Integration Theory

In a general sense, OIT (Deci & Ryan, 1985) differentiates amongst different types of motivation and accounts for consequences associated with each type.

The Taxonomy of Self-Determined Motivation. Deci and Ryan (1985) originally postulated there were four main types of motivation that differed by degree of self-determination. More contemporary work by Deci and Ryan and colleagues (Brière, Vallerand, Blais, & Pelletier, 1995; Deci & Ryan, 1991; Pelletier et al., 1995; Ryan, Connell, & Grolnick, 1990; Vallerand, Blais, Brière, & Pelletier, 1989; Vallerand et al., 1992, 1993) has identified seven different forms of motivation. More specifically, Brière et al. (1995), Pelletier et al. (1995), and Vallerand et al. (1989, 1992, 1993) proposed a tripartite taxonomy of intrinsic motivation. In a similar vein, Deci and Ryan (1985,1991) and Ryan et al. (1990) identified three different forms of extrinsic motivation[3]. From this vantage point, motivation can be broken down into three forms of intrinsic motivation, three types of extrinsic motivation, and an additional type of motivation known as *amotivation.*

At the highest level of self-determination is *intrinsic motivation.* This type of motivation refers to performing an activity for its own sake, out of interest, and/or for the pleasure and satisfaction derived from the experience (Deci, 1975; Deci & Ryan, 1985). Intrinsic motivation has typically been regarded as a global construct in the literature, however three conceptually distinct forms of intrinsic motivation have been identified, namely, *intrinsic motivation to know*, *intrinsic motivation toward accomplishments*, and *intrinsic motivation to experience stimulation* (Brière et al., 1995; Pelletier et al., 1995; Vallerand et al., 1989, 1992, 1993). By definition, each of these types of motivation are intrinsically rewarding in that the individual will engage in

---

[3] Deci and Ryan (1985, 1991) have actually identified four types of extrinsic motivation. However, this fourth type, *integrated regulation*, has seldom been empirically measured and was not assessed in the present study.

the activity as an end in itself and without regard for external rewards. However, each is considered self-determined because the individual will perform the activity out of personal choice.

Intrinsic motivation to know refers to engaging in an activity for the pleasure and satisfaction that are experienced through learning, exploring, or trying to understand something new. An example of this type of motivation can be illustrated in a case where athletes explore new and innovative ways to improve their athletic performance and as a result, experience as sense of pleasure and/or satisfaction. Intrinsic motivation toward accomplishment is characterised by the pleasure and satisfaction individuals experience while trying to accomplish something or to surpass their previous level of achievement. For example, athletes who attempt to learn or master a particular skill for intrinsic reasons would be exemplifying this type of motivation. Intrinsic motivation to experience stimulation is present when individuals perform an activity to seek out sensory pleasure or to live an exhilarating experience. In this regard, sensory stimulation may relate to pleasure, fun, or excitement. An example of this type of motivation would be exemplified by athletes who thrive on feelings of elation experienced through physical exertion or engagement in a particular activity.

The second general category of motivation is *extrinsic motivation*. This type of motivation refers to behaviour that can be considered a means to an end (Deci & Ryan, 1985). The fundamental goals of extrinsically motivated behaviour are to receive rewards and/or to avoid punishment. According to Deci and Ryan and colleagues (Deci & Ryan, 1985, 1991; Ryan et al., 1990) extrinsic motivation can be further classified into three separate forms each of which can be classified in terms of self-determination. From most self-determined to least self-determined, the three forms of extrinsic motivation are *identification*, *introjection*, and *external regulation*.

Identification refers to behaviour that is valued by the individual and is performed out of choice. This form of motivation is extrinsic because the activity is performed as a means to an end and not for intrinsic rewards such as pleasure or satisfaction. However, identification is also a self-determined form of motivation because the individual freely chooses to engage in the activity. By way of example, identification would be personified by athletes who willingly participate in sport because they value the activity. Introjection is exemplified when individuals place pressure upon themselves to perform an activity. In this regard, external contingencies are not required but are internalized by the individual. By way of example, introjection is personified when individuals exercise because they feel a sense of guilt if they do not engage in this activity. External regulation refers to behaviours that are controlled or regulated by external sources such as material rewards, constraints, or pressure. For example, individuals who participate in sport due to perceived pressures from peers, parents, coaches, or society would be exemplifying this form of motivation.

At the lowest level of self-determination is amotivation[4]. This type of motivation is characterized by the absence of intrinsic and extrinsic motivation and results when individuals perceive they have no sense of control over their actions. Thus, individuals would not derive rewards and/or benefits from their participation in an activity. As a construct, amotivation parallels the concept of learned helplessness (Abramson, Seligman, & Teasdale, 1978).

In short, there are seven different types of motivation; four forms of self-determined motivation (intrinsic motivation to know, intrinsic motivation toward accomplishments, intrinsic

---

[4] Recent work by Pelletier and colleagues (Stewart, Green-Demers, Pelletier, & Tuson, 1995; Tuson & Pelletier, 1992) has identified four types of amotivation. Since only one measure of amotivation was assessed in the present study, the different forms of amotivation are not presented.

motivation to experience stimulation, and identification) and three forms of non self-determined motivation (introjection, external regulation, and amotivation). Although it is useful to examine the seven types of motivation on an individual basis, researchers such as Vallerand (1993) have assessed the different motivational types in terms of a general orientation by regrouping them into a general motivational profile or index. Individuals with a self-determined motivational profile engage in sport or physical activity out of personal choice (identification) and/or for the pleasure and satisfaction derived from the experience (intrinsic motivation), whereas individuals with a non self-determined motivational profile engage in sport or physical activity as a result of internal controls (introjection), and/or external pressures (external regulation), or would not be motivated to do so (amotivation). Several investigations have compared these general motivational orientations across a multitude of variables and across a variety of setting (see Vallerand, 1993, 1997). It is also worth mentioning that a self-determined motivational profile has been likened to a task-involved goal-orientation, whereas a non self-determined motivational profile has been likened to an ego-involved goal-orientation (Li & Harmer, 1994).

Consequences of Motivation. The second major component of OIT focuses on the consequences of motivation. According to Deci and Ryan (1985, 1991), since self-determined forms of motivation are characterised by freedom of choice and in the case of intrinsic motivation, pleasure and/or satisfaction, they should lead to more positive consequences than non self-determined forms of motivation. Accordingly, the most self-determined forms of motivation (the three forms of intrinsic motivation and identification) should lead to the most positive consequences, whereas non self-determined forms of motivation (introjection, external regulation and amotivation) should effect the least positive outcomes.

Numerous studies have supported these predictions in laboratory settings (see Pelletier & Vallerand, 1993) and in a variety of natural settings including sport and physical activity (see Vallerand, 1993). Specifically, these investigations have demonstrated that self-determined forms of motivation are more positively related to outcomes such as persistence, performance, and positive emotions than non self-determined forms of motivation. Conversely, non self-determined forms of motivation have been more positively linked to consequences including dropout, anxiety, and dissatisfaction than self-determined forms of motivation.

Cognitive Evaluation Theory

CET is the second sub-theory of SDT (Deci & Ryan, 1985, 1991) and focuses on the proximal and distal determinants of motivation.

Proximal Determinants of Self-Determined Motivation. According to Deci and Ryan (1985, 1991), three proximal determinants have a direct influence on motivation, namely, *perceived autonomy*, *perceived competence*, and *perceived relatedness*. These three proximal motivational determinants are analogous with the three psychological needs for autonomy, competence, and relatedness. Perceived autonomy refers to the need to feel that one is the origin of his/her actions and encompasses the notion of choice (deCharms, 1968). Through their interaction with the environment, individuals strive to fulfill the need to initiate action from within and out of their own choosing. In certain respects, perceived autonomy may be likened to the notion of locus of causality (deCharms, 1968; Heider, 1958). Perceptions of competence are related to the need to interact proficiently or effectively with the environment. Accordingly, individuals strive to experience a sense of effectance or competence in their attempt to achieve desired outcomes or to avoid undesirable events. Perceived relatedness refers to feelings of

connectedness with others or a sense that one belongs in a particular social context. The notion of perceived relatedness is linked to the psychological need to interact with and care for other human beings.

According to CET, changes in one or more of the proximal determinants will effect changes in motivation. Specifically, increases in perceptions of autonomy, competence, or relatedness should promote self-determined forms of motivation and undermine non self-determined types of motivation. By way of comparison, decreases in one or more of the three proximal determinants should undermine self-determined forms of motivation and promote non self-determined motivational types.

Distal Determinants of Self-Determined Motivation. CET (Deci & Ryan, 1985, 1991) also accounts for factors in the social context or distal motivational determinants. It is posited that social factors such as perceptions of the motivational climate or perceptions of past success influence motivation through their direct impact on the three proximal motivational determinants. In other words, the three proximal determinants mediate this relationship. Social factors that increase one or more of the proximal determinants should enhance self-determined forms of motivation, whereas social factors that undermine one or more of these variables should subsequently undermine self-determined forms of motivation. The influence of distal determinants on proximal determinants and self-determined motivation can thus be summarized in the following manner: distal determinants · · > proximal determinants --> self-determined motivation. Numerous investigations have supported these relationships in a variety of life domains including sport and physical activity, leisure, and interpersonal relations (see Frederick & Ryan, 1995; Pelletier & Vallerand, 1993; Vallerand, 1993).

Motivational Sequence

When CET and OIT are combined, motivation can be described as a process that begins with determinants and ends with consequences. Vallerand (1993) delineated this process as the sequence: Antecedents --> Motivation --> Consequences. Antecedents, in this regard, are synonymous with the determinants of motivation and may therefore be distal or proximal. Motivational consequences are predicted to be influenced by the degree to which motivation can be considered self-determined. More specifically, self-determined forms of motivation should effect more positive consequences than non self-determined forms of motivation.

This conceptualization of motivation as a sequence is of value because it provides a comprehensive framework that can be tested in an empirically verifiable manner. By describing motivation as a process, an enriched understanding of the psychological processes underlying human behaviour may thus be ascertained. This sequence is also particularly useful from an applied perspective since it can be used to predict specific motivational consequences. For example, it could be used to predict important motivational outcomes such as persistence, positive mood states, well-being, and quality of life. While a number of studies have tested various aspects of this sequence in various life domains (see Vallerand, 1993), a limited amount of research has been conducted in the context of sport and physical activity. Indeed, very few studies have examined the motivational sequence in its entirety (see Fortier, Vallerand, & Guay, 1995 for an exception). Hence, examining this motivational sequence in its entirety, particular in sport and physical activity settings, would appear to be an important avenue for future research.

The Hierarchical Model of Intrinsic and Extrinsic Motivation

As a means of integrating the theoretical postulates underlying SDT (Deci & Ryan, 1985,

1991) with past research on intrinsic and extrinsic motivation (Csikszentmihalyi & Nakamura, 1989; Harter, 1978; Lepper & Greene, 1978), Vallerand (1997) recently proposed a Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM) (Figure 1).

According to Vallerand (1997), the HMIEM can be summarized in five basic propositions. The first proposition states that the study of motivation must include the constructs of intrinsic motivation, extrinsic motivation, and amotivation. More specifically, this would include the four types of self-determined motivation (intrinsic motivation to know, intrinsic motivation toward accomplishment, intrinsic motivation to experience stimulation, and identification) and the three types of non self-determined motivation (introjection, external regulation, and amotivation).

The second proposition states that the various types of motivation can exist at three hierarchical levels of generality, namely, global, contextual, and situational. *Global motivation* refers to a trait-like measure of motivation and is related to a general orientation to interact with the environment. Since motivation at the global level can also be likened to a personality-type measure, it is posited to be the most stable of the three hierarchical levels. *Contextual motivation* is characterised by a general orientation towards a specific context or life domains such as sport and physical activity, education, work, or interpersonal relations. Similar to global motivation, contextual motivation is considered relatively stable although it is subject to variation across life domains. *Situational motivation* is the most state specific measure and refers to an individual's motivation while currently engaged in a particular activity. Motivation at the situational level is considered the least stable level of the three hierarchical levels.

The third proposition refers to the determinants of motivation. It is posited that at each hierarchical level, motivation is influenced indirectly by distal determinants and directly influenced

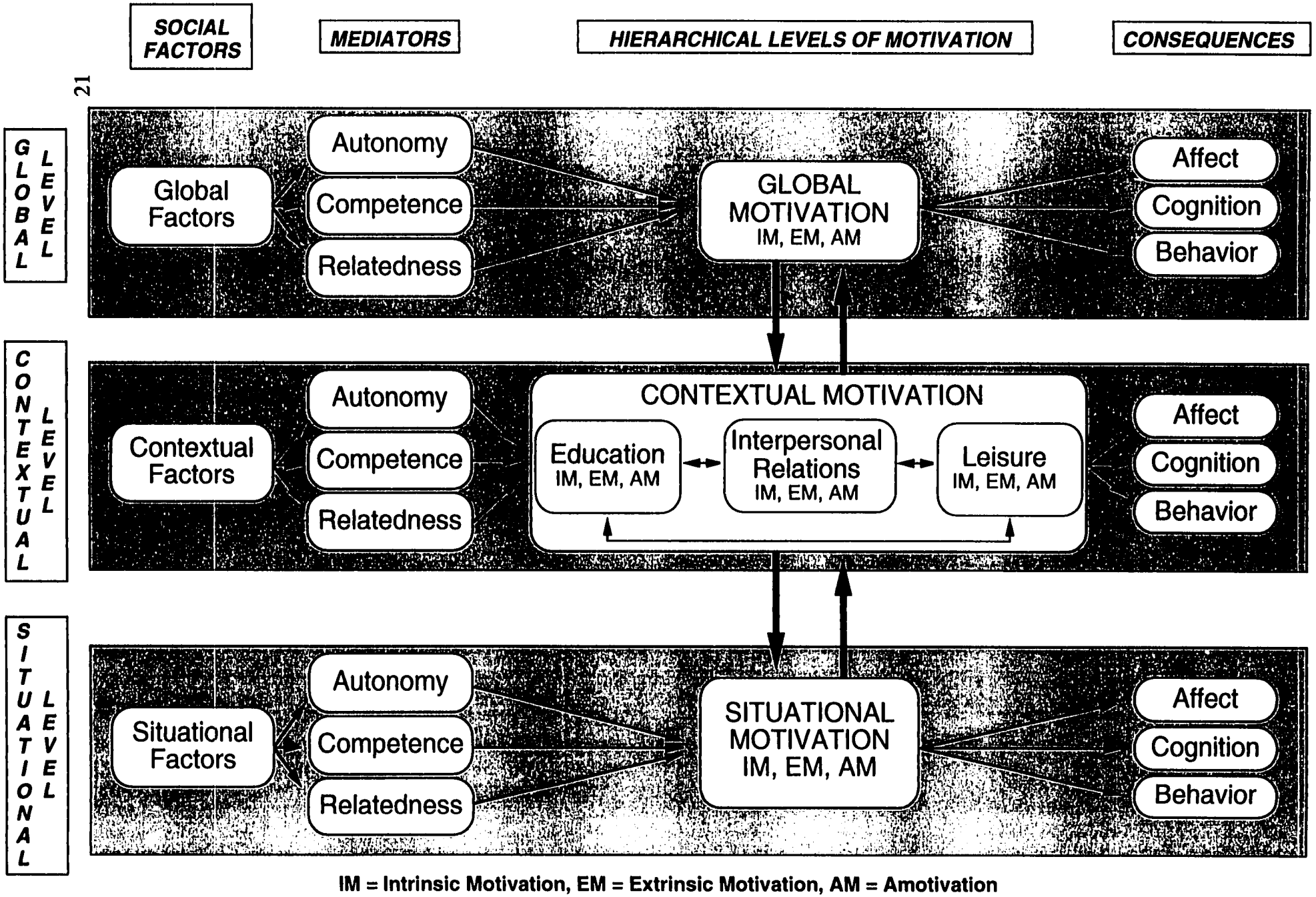


Figure 1. **The Hierarchical Model of Intrinsic and Extrinsic Motivation (Vallerand, 1997). Reprinted with permission from Robert J. Vallerand.**

by the three proximal determinants. As mentioned previously, it is predicted that distal determinants which increase one or more of the three proximal determinants of motivation will, in turn, promote self-determined forms of motivation. Conversely, social factors that decrease one or more proximal determinant will undermine self-determined forms of motivation.

In addition to being influenced by the social context and the three proximal determinants, motivation at the contextual and situational levels are postulated to be influenced by motivation at the next proximal hierarchical level in a top-down manner. Specifically, global and contextual motivation should act as determinants of contextual and situational motivation, respectively. Thus, in terms of the determinants of motivation, it is predicted that self-determined motivation will be influenced by distal and proximal determinants as well as self-determined motivation at the next highest hierarchical level.

The fourth proposition states that motivation at the situational and contextual levels will have a recursive, bottom-up effect on motivation at the next proximal level of generality. In this regard, it is postulated that over time, situational motivation will influence contextual motivation, just as contextual motivation will affect global motivation. It is reasoned that if, for example, an individual is consistently intrinsically motivated while engaging in a particular sport (i.e., at the situational level), this should promote his/her intrinsic motivation towards that sport in general (i.e., at the contextual level).

The fifth and final proposition relates to motivational consequences. At each hierarchical level it is posited that motivation will directly influence motivational consequences at the same hierarchical level. In this regard, more self-determined forms of motivation should bring about more positive consequences, whereas less self-determined motivational types should effect less

positive outcomes.

When proposition three (determinants of motivation) is combined with proposition five (motivational consequences), motivation at each hierarchical level can be described as a process that begins with determinants and ends with consequences. This process is identical to aforementioned Antecedents --> Motivation --> Consequences sequence (Vallerand, 1993).

Scores of empirical research investigations have supported the different links in the HMIEM (see Vallerand, 1993, 1997), however, only a few studies have tested more than a single link in the same investigation (e.g., Blanchard et al., 1995; Chantal et al., 1996). In fact, only one study to date has attempted to verify the model in its entirety with this investigation being conducted in an academic setting (see Vallerand & Guay, 1996). While results of these studies were encouraging in the sense that many of the theoretical relationships delineated in that this model were empirically verified, future research is needed in order to further validate the HMIEM. It would also seem important to test this model in the context of sport and physical activity given its potential to forward an understanding of motivation in this domain.

Moreover, while the HMIEM (Vallerand, 1997) seems to be a solid and potentially useful framework for describing human motivation, certain relationships have not been identified in this model, for example, the relationship between motivational consequences at one level of generality and motivation at another hierarchical level. Although this link was not originally proposed by Vallerand, it is certainly possible that, over time, motivational consequences at a situational level could enhance or undermine self-determined motivation at a contextual level. Accordingly, examining the way in which motivational consequences at one hierarchical level influence motivation at another level of generality would appear to be a fruitful avenue for future research.

It is also worth mentioning that integrating both contextual and situational variables as a means of examining important constructs such as motivation has emerged as a recent trend in contemporary research on sport and exercise psychology. For example, studies conducted by Andree and Whitehead (1995), Ebbeck, Gibbons, and Loken-Dahle (1995), Newton (1994), and Seifriz et al. (1992) have each assessed contextual and situational variables in an attempt to explain motivation. In the literature on goal-setting, Locke and Latham (1990) have also integrated contextual and situational variables in their Competitive Goal-Setting Model. Similar approaches have been advocated by Burton (1992, 1993). Finally, researchers such as Martens (1982) and Vealey (1986, 1988) have followed a similar line of thinking in examining anxiety and self-confidence, respectively. Hence, the number of studies in which contextual and situational measures have been integrated as a means of understanding various aspects of cognition, affection, and behaviour clearly illustrates the salience of this approach. In this regard, the HMIEM (Vallerand, 1997) may serve as highly useful framework for examining the psychological processes underlying motivation towards sport and physical activity.

An Inquiry Into the Realm of Consciousness: The Flow State

The manner in which human beings experience the world has long been a topic of interest in psychology. This has been particularly true with respect to those who have endeavoured to explore the depths of the human psyche by examining states of consciousness. Over the course of the past decades, an impressive body of knowledge has been generated in the area of psychological states (see Farthing, 1992; Lee, Ornstein, Galin, Deikman, & Tart, 1976; Tart, 1975; Wolman & Ullman, 1986). Yet, while much has been learned about states of consciousness, innumerable questions remain unanswered both from the viewpoint of those conducting research on this topic

and those who have first hand experience with a variety of psychological states.

One approach that has made a significant contribution in this area stems from the work of Csikszentmihalyi (1975a, 1990) on flow. The value of Csikszentmihalyi's work has been evidenced by the myriad of studies that have examined the flow state in a variety of life domains including work and leisure (Csikszentmihalyi, 1975a; Csikszentmihalyi & LeFevre, 1989) and education (Carli et al., 1988; Csikszentmihalyi et al., 1993; Larson, 1988; Nakamura, 1988).

In the literature on sport and exercise psychology, research on flow has been fairly limited (Kimiecik & Stein, 1992) and until recently, was based primarily on anecdotal accounts of sporting experiences (Garfield & Bennett, 1984; Loehr, 1986). However, more contemporary work has started to examine the experience of this psychological state (Grove & Lewis, 1996; Jackson, 1992, 1995; Jackson & Marsh, 1996; Jackson & Roberts, 1992, Stein et al., 1995). This is not surprising considering the number of extraordinary subjective experiences so frequently reported by individuals who engage in sport (Murphy & White, 1995) and given that flow has been linked with a number of positive outcomes such as satisfaction, pleasure, and self-growth (Csikszentmihalyi, 1990; Csikszentmihalyi & Rathunde, 1993).

Peak Moments: Flow, Peak Experience, and Peak Performance

In the literature on sport and exercise psychology, the term *peak moments* (McInman & Grove, 1991) has been used in general reference to similar and often confused constructs, namely, *flow*, *peak experience,* and *peak performance* (Jackson, 1993; McInman & Grove, 1991; Privette, 1983; Privette & Bundrick, 1991). Much of the confusion regarding the use of these terms is due to an emphasis on competitive or behavioural outcomes (Jackson, 1993; Kimiecik & Stein, 1992) and while there are certain similarities among them, to consider flow, peak experience, and peak

performance as synonymous is erroneous. In fact, although Privette (1983) and Privette and Bundrick (1991) have attempted to empirically demonstrate the independence of these constructs, there still exists a considerable amount of ambiguity with respect to how each of them is used, not only in academic circles but in the world of sport. In an attempt to clarify this ambiguity, flow, peak experience, and peak performance will be defined and compared.

Flow

Flow has been termed "the psychology of optimal experience"[5] (Csikszentmihalyi, 1990) and is defined as a subjective psychological state in which individuals become so completely immersed in an activity that nothing else seems to matter. This experiential state occurs when the perceived abilities or skills of the individual are matched with the perceived challenges of the situation and is characterized by such things as a feeling of enjoyment, a sense of oneness with the activity, and a distortion of time. While flow has the potential to occur at any time, Csikszentmihalyi (1990) suggested it is more likely to occur in certain activities including sport, leisure, or work since these activities are designed to bring order to consciousness. Flow may also been considered an end in itself in the sense that people who experience it will keep engaging in the (flow-producing) activity in order to continue experiencing this psychological state. This particular quality of flow was succinctly described by Csikszentmihalyi (1975b) who noted that "the purpose of flow is to keep on flowing" (p. 47).

---

[5] The use of the term *optimal* as in *optimal experience* or *optimal psychological state* may be somewhat misleading in that it implies flow is an ideal, ultimate, or supreme state. From the literature on states of consciousness, there are numerous psychological states that may likewise be considered optimal in their own right (see Tart, 1975; Wolman & Ullman, 1986). Accordingly, the terms optimal experience of optimal psychological state should be interpreted with caution.

Peak Experience

Peak experience refers to the extreme upper limits of positive feelings (Privette & Bundrick, 1991). This type of subjective experience is considered a highly valued moment characterized by intense feelings of joy, illumination, and/or bliss (McInman & Grove, 1991). Much of the early research on peak experience was conducted by Maslow (1968) who defined this construct as "moments of highest happiness and fulfillment" (p.73). While it is generally accepted that peak experiences have the potential to occur at any time, the actual number of instances in which an individual lives such an experience may be extremely rare indeed (Ravizza, 1984).

Peak Performance

Peak performance describes the superior use of human potential (Privette, 1983) and exemplifies the upper limits of functioning (Privette & Bundrick, 1991). While peak performance is often considered a behavioural measure, it is not necessarily limited to physical functioning but may encompass mental processes (Privette, 1981a; Williams & Krane, 1993). This construct has also been likened to a level rather than a type of functioning (Privette, 1983). A peak performance has the potential to occur in any given situation (Privette, 1981a; Privette & Landsman, 1983), however, it is likely that certain types of activities are more conducive to its attainment.

A common misconception concerning peak performance is that it is analogous to outstanding competitive outcomes such as winning. While competitive outcomes may indeed be associated with peak performances, they are not a necessary requisite of superior human functioning. The standards against which one measures peak performance are relative to oneself, that is, one's previous level of functioning, and does not necessarily include a comparison with others (McInman & Grove, 1991; Privette & Landsman, 1983).

Differentiating Amongst Flow, Peak Experience, and Peak Performance

Flow, peak experience, and peak performance share many common characteristics and for this reason, have often been considered conceptually similar. Instead of presenting a detailed account of the similarities and differences among these constructs, only the major distinguishing characteristics will be presented (for a more comprehensive comparison see Jackson, 1993; McInman & Grove, 1991; Privette, 1983; Privette & Bundrick, 1991).

To begin differentiating among these three constructs, it is useful to consider peak performance as conceptually distinct from peak experience and flow. Simply stated, peak performance is related to superior human functioning, whereas peak experience and flow are both subjective experiences. While peak experience and/or flow may occur concurrently with peak performance (Privette, 1981a, 1981b; Privette & Bundrick, 1991), superior functioning is not a requisite of either. Thus, while flow, peak experience, and peak performance may occur simultaneously, peak performance may occur independently of flow and/or peak experience (Cohn, 1991).

In terms of the difference between peak experience and flow, it is useful to consider the intensity and frequency of these subjective experiences. Peak experiences are related to the extreme upper limits of joy, illumination, and/or bliss. By way of comparison, flow is not necessarily typified by the same degree or intensity of positive affect. With respect to their frequency of occurrence, Ravizza (1984) suggested that peak experiences are relatively rare occurrences, whereas Kimiecik and Stein (1992) noted that flow may be experienced much more often. Thus, peak experiences may occur on rare occasions during one's life. Flow, on the other hand, may occur on a much more frequent basis.

It would also seem that flow, as conceptualized by Csikszentmihalyi (1975a, 1990) is an altered state of consciousness. More specifically, flow would be an altered state of consciousness because it is conceptually distinct when compared to a baseline state such as our "normal" or everyday consciousness (see Tart, 1975).Conversely, peak experience is not a psychological state *per se* but may indeed occur while an individual is in an altered state of consciousness, for example, while in flow.

In short, these three constructs can be distinguished in the following manner: flow is a positive psychological state that refers to an individual being completely involved in an activity to the point of losing concern for everything else; peak experience refers to the extreme upper limits of positive feelings; and peak performance refers to superior human functioning. The remainder of this thesis will focus on the flow state.

Characteristics of the Flow State

Since Csikszentmihalyi's (1975a; 1975b) original research on flow, a number of studies have endeavoured to identify the characteristics of this psychological state (see Csikszentmihalyi & Csikszentmihalyi, 1988). Recent work in the area of sport and exercise psychology has followed a similar line of inquiry (e.g., Jackson, 1992, 1995) which has lead to the development of the Flow State Scale (Jackson & Marsh, 1996), a measuring instrument designed to assess the experience of flow. There are nine flow characteristics that are measured by this instrument, namely, balanced skills and challenges, merging of action and awareness, centering of attention, loss of self-consciousness, transformation of time, a sense of control, the existence of clear goals, the existence of unambiguous feedback, and the autotelic nature of the experience. These nine characteristics are described in the following paragraphs.

One of the fundamental characteristics of flow is the existence of a balance between the perceived skills of the individual and the perceived challenges of the situation. The flow state is posited to occur when an individual is *optimally challenged*, that is, when perceived abilities are matched with perceived challenges. In this regard, the role of perception is essential to the experience of flow.

As a means of describing the relationship between perceived skills and perceived challenges, Csikszentmihalyi (1975b) proposed a Flow Model. According to this model, a number of affective states result from the relationship between these variables. A state of worry was hypothesized to occur when perceived challenges exceeded perceived skills. Taken to the extreme, that is, when challenges heavily outweighed skills, a state of anxiety would result. When perceived skills were in excess of perceived challenges, the resulting affective state would be boredom. If this ratio was further increased, that is, if skills were far greater than challenges, anxiety would, once again, occur. Finally, when the ratio between perceived skills and challenges was balanced, flow would be experienced.

Csikszentmihalyi's (1975b) Flow Model was later modified by Massimini and Carli (1986) to accommodate data collected using the Experience Sampling Method (ESM - Csikszentmihalyi, Larson, & Prescott, 1977). What set Massimini and Carli's model apart from Csikszentmihalyi's was that the potential affective states were measured relative to an individual's average level of perceived skills and challenges. That is, the flow state would occur if, and only if: (a) the perceived skills of the individual were balanced with the perceived challenges of the situation, and (b) the perceived skills and challenges were above the individual's average measure of each. For Massimini and Carli, apathy was posited to occur when perceived skills and challenges were

below one's average. When perceived skills exceeded perceived challenges relative to one's average, it was postulated that boredom would result. Finally, when perceived challenges outweighed perceived skills relative to one's average, anxiety would be experienced. It is worth mentioning that in the literature on flow, the skills-challenges balance has most often been used to operationalise this psychological state (see Csikszentmihalyi & Csikszentmihalyi, 1988).

Another characteristic of flow is the merging of action and awareness. This characteristic refers to the connection between the individual and the activity in which they are currently engaged. While in a state of flow, individuals become deeply involved in the activity and their actions become automated and spontaneous. Since this connectedness is so pervasive, the individual is said to "merge" with the activity.

When in a state of flow, an individual's attention is completely focussed on an activity. This is a further characteristic of this psychological state. Since one's attention becomes unequivocally concentrated on a particular task or stimulus field, no additional attention is available to be allocated to competing or irrelevant stimuli without interrupting the flow. For this reason, an individual's ability to concentrate is central to the experience of flow.

Another characteristic of flow is that an individual ceases to be concerned with his/herself and instead focuses completely on the activity. In this regard, Csikszentmihalyi (1990) noted that a loss of self-consciousness does not imply a loss in one's ability to function nor does it intimate a loss consciousness. Rather, a loss of self-consciousness implies that an individual loses concern for his/her notion of self.

The Transformation of Time characteristic refers to the manner in which an individual perceives the passage of time while in flow. In this regard, time becomes distorted or altered in

the sense that it may speed up or slow down (Csikszentmihalyi, 1990).

Having a heightened sense of control over oneself and/or the environment is another characteristic of flow. In this regard, an individual will perceive they have the capacity to exercise control over their physical functioning, mental functioning, and/or the demands of the situation. Csikszentmihalyi (1990) further described this characteristic as being paradoxical in that the individual may feel in control because they are free from worry about not being in control.

A further characteristic of this psychological state is the existence of clearly defined goals. This implies that the individual has a clear understanding of what they are trying accomplish prior to engaging in the activity and/or creates goals while involved in the task (Csikszentmihalyi, 1990).

Unambiguous feedback is an another flow characteristic that is directly related to the existence of clear goals. Having clear, unambiguous feedback influences flow because it provides an individual with information regarding the attainment of their objectives. In this regard, feedback may be provided from an external source, for example, another person or derived from the activity itself.

Finally, Autotelic Experience is an additional characteristic of flow. The *autotelic* nature of the flow state refers to the enjoyment or pleasure experienced while engaged in the (flow-producing) activity. The term autotelic is derived from the Greek words *auto* and *telos* which mean self and goal, respectively. Thus, the term autotelic translates into *self-directed goal.* In this regard, flow can be considered an end in and of itself.

To summarize, flow is a multi-dimensional experiential state that stands out perceptually, cognitively, and affectively from other experiences. It can also be considered an altered state of

consciousness (Tart, 1975) which is distinct from one's normal or everyday waking state.

The Relationship between Motivation and Flow

In synthesizing the literature on motivation with the description of flow presented thus far, one may be inclined to ask: In what way are motivation and flow related? To begin answering this question, it is insightful to examine the origin of Csikszentmihalyi's research on flow states. His earliest work on flow was derived from three primary sources; the literatures on play, peak experience, and intrinsic motivation (Csikszentmihalyi, 1975b). Given that his conceptualization of this psychological state founded, at least in part, on the pioneering work of deCharms (1968), Deci (1971), and White (1959) in the area of intrinsic motivation, it is understandable why intrinsic motivation and flow have often been considered conceptually similar (Csikszentmihalyi & Nakamura, 1989; Csikszentmihalyi & Rathunde, 1993). Yet, when one carefully examines the definitions of these constructs, their conceptual distinction is evident.

As previously defined, motivation is the sum total of internal and external forces responsible for the initiation, direction, intensity, and persistence of behaviour (Vallerand & Thill, 1993a). Flow, on the other hand, refers to a positive psychological state characterised by such things as the merging of action and awareness, concentration on the task at hand, a transformation of time, and the existence of a balance between the perceived skills of the individual and the perceived challenges of the situation (Csikszentmihalyi, 1990). Since the experience of flow is dependent upon the interaction between an individual and an activity, and in a broader sense, the environment, he or she would not engage in an activity, let alone an optimally challenging one, unless he or she was motivated to do so. In other words, flow would not be experienced unless an individual initially engaged in an activity. Hence, motivation may be considered to be the initial

energy responsible for the individual's participation in an optimally challenging activity, whereas flow can be thought of as a positive psychological state that is experienced while engaged in the activity.

In terms of empirical research, several studies have attempted to examine the relationship between motivation and flow. Csikszentmihalyi and LeFevre (1989) assessed the link between intrinsic motivation and the experience of flow in a study conducted in a work and leisure context. Intrinsic motivation was measured using a single question regarding subjects' desire to be doing something other than the activity itself, whereas flow was assessed using a measure of the skills-challenges balance. Results revealed that individuals who were intrinsically motivated reported higher instances of flow.

In a similar light, Haworth and Hill (1992) examined the relationship between intrinsic motivation and flow in a study conducted with adult office workers. Their measure of intrinsic motivation was based on: (a) whether the workers wished to engage in the activity, and (b) whether they wanted to continue doing so. Flow was assessed using a ratio between the workers' perceived skills and challenges. Findings likewise suggested that flow was positively associated with intrinsic motivation.

While both of these investigations demonstrate that flow and intrinsic motivation are positively linked, neither explained the directionality of this relationship since they were correlational in nature and conducted at a single point in time. If, by definition, flow occurs when an individual freely chooses to engage in an activity, can self-determined forms of motivation (intrinsic motivation and identification) be considered psychological antecedents of flow? Or, does the experience of flow bring about self-determined forms of motivation?

Self-Determined Forms of Motivation as Antecedents of Flow

Theoretically speaking, self-determined forms of motivation are posited to bring about a wide range of positive consequences which may certainly include subjective experiences such as flow (Deci & Ryan, 1985, 1991). This line of reasoning has also been advanced by Tinsley and Tinsley (1986) in the literature on leisure studies. Specifically, these researchers have clearly suggested that there is a positive, causal relationship between intrinsic motivation and the experience of the *leisure state* (a positive psychological state analogous to flow).

Empirical evidence supporting the positive influence of self-determined forms of motivation on flow has emerged from a certain number of studies in which psychological antecedents of the flow state have been assessed. In a cross-cultural qualitative investigation, Massimini et al. (1988) examined the phenomenology of flow experiences. It was found that ten factors were perceived by participants as being precursors of flow. Of these ten factors, intrinsic motivation emerged as a variable believed to facilitate the occurrence of this psychological state. Similar findings from two leisure studies have also supported the existence of a positive and direct link between intrinsic motivation and flow (Iso-Ahola, 1979; Graef et al., 1983).

Research examining psychological antecedents of flow in sport and physical activity settings has provided further evidence supporting the positive link between motivation and flow states. In one of the first studies in this area, Jackson (1992) interviewed elite-level figure skaters in order to assess the characteristics of the flow state and to determine which factors were responsible for facilitating and undermining this psychological state. An inductive analysis of the interview data revealed that five factors facilitated the occurrence of flow. While motivation was not considered one of these five factors in its own right, it did emerge as a variable related to one

of these factors (positive mental attitude). This finding was significant since it clearly suggested motivation may act as an antecedent of flow and showed the salience of this relationship in sport and physical activity settings.

In a similar investigation conducted with elite-level athletes from a multitude of sports, Jackson (1995) identified eleven factors believed to facilitate flow and nine factors believed to preclude its occurrence. From the inductive analysis, motivation emerged as a factor believed to facilitate *and* undermine the experience of flow. These findings provided additional support for hypothesis linking motivation to flow. However, what was not assessed in either of the Jackson studies was the specific type of motivation responsible for facilitating the flow state or preventing it from occurring. This is of importance in the context of the present discussion because it has been postulated that self-determined forms of motivation should lead to more positive consequences (e.g., flow) than non self-determined motivational types (Deci & Ryan, 1985, 1991).

Research focussing on motivational antecedents of flow has also been conducted in the context of leisure settings. Mannell, Zuzaneck, and Larson (1988) examined the relationship between motivation and flow in a study of elderly adults. In this investigation, the link between intrinsic motivation, extrinsic motivation, perceived freedom, and flow was assessed. It was hypothesized that freely chosen activities in which individuals were intrinsically motivated would lead to the most intense experiences of flow. Contrary to expectations, it was revealed that individuals who were extrinsically motivated but freely chose to engage in the leisure activity reported the most intense instances of flow. This finding seemingly contradicted the prediction that intrinsic motivation leads to more positive outcomes than extrinsic motivation.

When the measures of intrinsic and extrinsic motivation employed by Mannell et al. (1988) are more rigorously examined, this finding does not, in fact, contradict theoretical expectations. Intrinsic motivation was measured using a question related to engaging in the activity for its own sake. Extrinsic motivation was measured using two questions related to: (a) performing the activity for others, or (b) performing the activity for one's long-term benefit. When examined from the vantage point of SDT (Deci & Ryan, 1985, 1991), an individual who freely chooses to engage in a recreational activity for their long-term benefit is actually motivated by identification, a self-determined form of extrinsic motivation. According to Deci and Ryan, this type of motivation should lead to more positive outcomes than non-self-determined motivational forms. Hence, the finding of Mannell and colleagues actually provides empirical support for the positive link between self-determined motivation and positive motivational consequences such as flow.

In another study conducted by Jackson and Roberts (1992), GPT (see Ames, 1992; Duda, 1993; Nicholls, 1984, 1989; Roberts, 1992a) was used as a theoretical basis for examining the relationship between goal-orientations, perceived ability, flow, and peak performance. It was predicted that: (a) athletes whose motivation was task-involved would experience flow more often than athletes whose motivation was ego-involved and (b) athletes who reported higher levels of perceived ability would experience flow more often than those reporting lower levels of perceived ability. Goal-orientations and perceptions of ability were both measured at a contextual level, whereas flow was assessed at a situational level. Results were in line with predictions and demonstrated that a contextual task-involved goal-orientation and perceptions of ability were both positively related to flow. It is important to mention that while Jackson and Roberts viewed motivation (goal-orientations) as an antecedent of flow, it was not determined whether a task-

involved goal-orientation influenced flow or whether flow influenced a task-involved goal-orientation since both variables were assessed at a single point in time.

In order to address this issue, Stein and colleagues (1995) examined the relationship between state motivational antecedents of flow and the experience of this psychological state in three prospective studies conducted in the context of recreational sport. In each investigation, it was hypothesized that state measures of task-involvement, perceived competence, and self-confidence would be positively related to flow. Contrary to expectations, no significant relationships were found in any of the studies. These results were somewhat surprising and appeared to contradict those of Jackson and Roberts (1992). However, it should be noted that Stein et al. measured situational antecedents of flow, whereas Jackson and Roberts assessed contextual determinants of flow. The relationship between flow and state motivational antecedents may therefore differ from the relationship between flow and contextual motivational antecedents. Accordingly, future research examining state and/or trait antecedents of flow would appear to be needed (Stein et al., 1995). In this regard, using a theoretical framework such as the HMIEM (Vallerand, 1997) which takes both contextual and situational variables into account may prove fruitful for future research.

Self-Determined Forms of Motivation as a Consequence of Flow

Despite the theoretical postulate linking flow to a variety of positive outcomes (Csikszentmihalyi, 1990, Csikszentmihalyi & Rathunde, 1993), empirical research assessing the consequences of flow has been limited. A certain number of investigations have, however, provided indirect support for this link. Wells (1988) examined the relationship between flow and self-esteem and found working women who reported high instances of flow also reported high

levels of self-esteem. Similarly, Csikszentmihalyi and LeFevre (1989) revealed that the experience of flow was positively related to life satisfaction in the context of work and leisure. Han (1988) also provided empirical support for the positive relationship between flow and life satisfaction in a study conducted with elderly Korean immigrants. Since each of these investigations was associational in nature and conducted at a single point in time, the direction of causality between flow and these variables was not ascertained. Despite this fact, results of these studies do seem to indicate that flow may have an important influence on a wide range of variables.

The causal nature of the relationship between flow and certain consequences thereof has been examined on a longitudinal basis by Csikszentmihalyi et al. (1993). In a study conducted with teenage students, results revealed that flow was positively and directly linked to the development of talent over time. It was also found that the experience of flow provided teenagers with a source of motivation to actively seek out opportunities for enhancing their skills and abilities. These findings clearly suggest that flow may indeed have a direct and positive influence on a number of variables including self-determined forms of motivation. Future studies may do well to further explore this possibility.

In summary, a review of the existent literature on motivation and flow indicates there are a number of areas worthy of further exploration. Specifically, several questions remain unanswered concerning the relationship between these constructs. These pertain to the link between situational motivation and flow as well as between extrinsic motivation and the experience of this psychological state. In addressing these issues, Vallerand's (1997) HMIEM would appear to be a salient conceptual basis. By integrating flow into this theoretical framework as a consequence of situational self-determined motivation, specific hypotheses regarding the link

between situational motivation and flow as well as between the flow state and contextual motivation can be assessed. Moreover, since the HMIEM is based preponderantly on SDT (Deci & Ryan, 1985, 1991) and considering that no study has used SDT to examine the experience of flow, it may be useful in this regard.

The Present Study

Accordingly, the general purpose of this thesis was to examine the relationship between motivation and flow. This was done in the context of master's level swimming using a two-wave time-lagged design. At Time 1, situational measures of distal motivational determinants, proximal motivational determinants, motivation, and flow were assessed. At Time 2, one week later, contextual measures of these same variables were assessed with the exception of the flow state. Two sets of analyses were conducted. In the first set of analyses, the relationships between different forms of situational motivation and flow and between situational motivational determinants and the experience of this psychological state were examined (see Article 1, *Motivational Determinants of Flow: Contribution from Self-Determination Theory*). In the second set of analyses, a more complex Motivational Model of Flow (Figure 2) was proposed and tested based on Vallerand's (1997) HMIEM (see Article 2, *Towards a Motivational Model of Flow: Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation*). Variables at the situational and contextual levels of generality were incorporated into the proposed model.

Significance of the Study

The present thesis is of significance for a number of theoretical and practical reasons. From a theoretical perspective, it serves to extend the existent literature on motivation and flow. Due

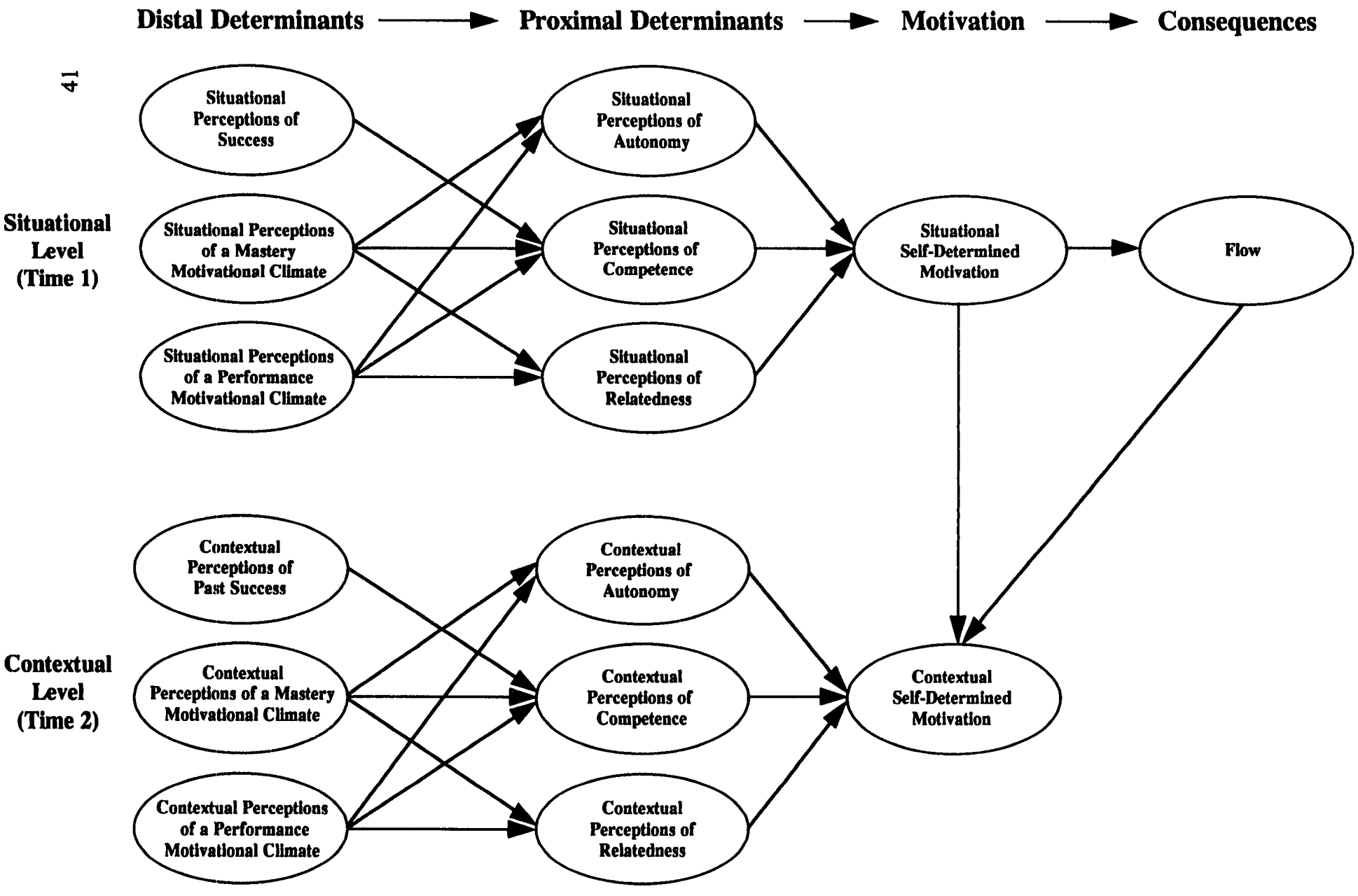


Figure 2. **The Motivational Model of Flow**

to the limited number of studies examining positive subjective experiences in sport and physical activity settings, this study adds to a growing body of knowledge on flow. More specifically, the present thesis will assesses the relationship between situational motivation and the experience of this psychological state. Since no study to date has used SDT (Deci & Ryan, 1985, 1991) as a theoretical basis for investigating flow and since this theoretical perspective has recently been used to examine other important motivational consequences such as positive emotions (Frederick et al., 1996), persistence (Fortier & Grenier, in press; Pelletier et al., 1997), and sportsmanship attitudes (Vallerand & Losier, 1994), it may likewise be employed to assess the flow state. In addition, few studies in sport and physical activity contexts have empirically tested the validity of the HMIEM (Vallerand, 1997). This is important given the potential for this model to forward understanding of the mechanisms underlying motivation in this domain. The proposed Motivational Model of Flow also extends the HMIEM by testing the important yet unexplored relationship between motivational consequences at one hierarchical level and self-determined motivation at another level of generality. Finally, by using a time-lagged design, the current investigation allows for an examination of the temporal relationship between different levels of self-determined motivation (situational and contextual) as well as the link between flow and self-determined contextual motivation.

From a practical perspective, the current investigation has the potential to forward understanding regarding what brings about self-determined motivation as well as how flow states occur. Accordingly, athletes, coaches, teachers, and/or sport psychology consultants may be better able to promote self-determined motivation as well as facilitate the experience of this psychological state.

CHAPTER III

PRESENTATION OF THE JOURNAL ARTICLES

Two journal articles are presented in this chapter, *Motivational Determinants of Flow: Contributions from Self-Determination Theory* and *Towards a Motivational Model of Flow: Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation*. Both articles are based on a single study conducted in the context of physical activity and both have been prepared for publication in academic journals.

Running Head: MOTIVATIONAL DETERMINANTS OF FLOW

Motivational Determinants of Flow: Contributions from Self-Determination Theory

John Kowal and Michelle S. Fortier

University of Ottawa

Ottawa, Ontario, Canada

Author Note

John Kowal, School of Human Kinetics; Michelle S. Fortier, Ph.D., School of Human Kinetics.

We would like to thank Karrie Hamilton, Carol Stroud, and Mark Grenier for their assistance with the data collection.

Correspondence concerning this article should be addressed to Michelle S. Fortier, Ph.D., School of Human Kinetics, University of Ottawa, 125 University, P.O. Box 450, Stn. A, Ottawa, Ontario, Canada, K1N 6N5.

Abstract

The purposes of the study were to examine the relationships between different types of situational motivation and flow and between situational motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness) and the experience of this psychological state. Two hundred and three Canadian master's level swimmers completed a questionnaire assessing the different variables immediately following a swim practice. Results indicated that situational self-determined forms of motivation (intrinsic motivation and self-determined extrinsic motivation) as well as perceptions of autonomy, competence, and relatedness were positively related to flow, whereas amotivation was negatively related to this psychological state.

Motivational Determinants of Flow: Contributions from Self-Determination Theory

The manner in which human beings experience the world has long been a topic of interest in psychology. Over the past few decades, research on states of consciousness has produced an impressive body of knowledge in this regard (Farthing, 1992; Lee, Ornstein, Galin, Deikman, & Tart, 1976; Tart, 1975; Wolman & Ullman, 1986). While much has been learned about states of consciousness, numerous questions remain unanswered both from the vantage point of those conducting research on this subject and those having first hand experience with a wide range of psychological states.

The Flow State

One theoretical perspective in this area stems from the work of Csikszentmihalyi (1975a, 1975b, 1990) on flow. The value of Csikszentmihalyi's approach has been evidenced by scores of empirical studies in a variety of life domains including work and leisure (Csikszentmihalyi, 1975a; Csikszentmihalyi & LeFevre, 1989; Wells, 1988), education (Carli, Delle Fave, & Massimini, 1988; Csikszentmihalyi, Rathunde, & Whelan, 1993; Larson, 1988; Nakamura, 1988), and sport and physical activity (Grove & Lewis, 1996; Jackson, 1992, 1995; Jackson & Roberts, 1992; Stein, Kimiecik, Daniels, & Jackson, 1995). According to Csikszentmihalyi (1975b), flow is a highly enjoyable psychological state that refers to the "holistic sensation people feel when they act with total involvement (in an activity)" (p. 36). While in this state, they become completely immersed in the activity to the point of losing awareness of time, their surroundings, and everything except the activity itself.

Csikszentmihalyi (1990) and others (Jackson & Marsh, 1996) have identified nine characteristics of the flow state, namely, (a) the existence of a balance between the perceived

skills of an individual and the perceived challenges of a situation, (b) a merging of action and awareness, (c) the presence of clear goals, (d) the presence of unambiguous feedback, (e) concentration on the task at hand, (f) a sense of control over oneself and/or the environment, (g) a loss of self-consciousness, (h) a transformation of time, and (i) the autotelic or enjoyable nature of the experience. Delineating the characteristics of flow has been instrumental in forwarding an understanding of the phenomenology of this psychological state. However, it has provided mere clues with respect to how flow states occur.

Thus, researchers have attempted to identify and examine antecedents of flow. In a cross cultural study, Massimini, Csikszentmihalyi, and Delle Fave (1988) asked participants to identify precursors to flow and found that a wide range of variables including the nature of the activity, concentration on the task, and a positive mood were perceived as being determinants of the flow state. Similarly, Jackson (1992, 1995) found that factors such as pre-competitive and competitive planning, a positive mental attitude, and physical readiness were believed to facilitate the experience of flow in two qualitative investigations conducted with elite level athletes.

Another antecedent of flow that emerged from the Jackson (1992, 1995) and Massimini et al. (1988) investigations was motivation. Indeed, results suggested that individuals who were highly motivated experienced high instances of the flow state. Some researchers (e.g., Csikszentmihalyi & LeFevre, 1989; Graef, Csikszentmihalyi, & McManama-Gianinno, 1983; Haworth & Hill, 1992) have specifically examined the relationship between motivation and flow and have found a positive link between intrinsic motivation and the experience of this psychological state. The relationship between intrinsic motivation, extrinsic motivation,

perceived freedom, and flow was also assessed by Mannell, Zuzanek, and Larson (1988) who hypothesized that freely chosen activities in which individuals were intrinsically motivated would lead to the highest instances of flow. Contrary to expectations, results indicated that extrinsically motivated individuals who freely chose to engage in leisure activities actually reported the highest instances of the flow state. The findings of Mannell et al. appear to contradict those of past studies (Csikszentmihalyi & LeFevre, 1989; Graef et al., 1983; Haworth & Hill, 1992) and raise questions regarding the manner in which extrinsic motivation and flow are related.

In the literature on sport and exercise psychology, Jackson and Roberts (1992) assessed the relationship between motivation (i.e., goal-orientations) and flow in a recreational sport setting. In this investigation, goal-orientations were measured at a contextual level, whereas flow was assessed at a situational level. Results indicated that a task-involved goal-orientation was positively related to the flow state. Following a similar line of inquiry, Stein et al. (1995) conducted three prospective studies in order to examine the relationship between goal-orientations, perceptions of competence, confidence, and flow. However, contrary to Jackson and Roberts, Stein et al. assessed all variables at a situational level. The importance of assessing situational antecedents as compared to contextual antecedents was discussed by Stein et al. who reasoned that, in line with Rotter (1975), situation-specific measures (e.g., antecedents) should show a stronger relationship with situational outcomes (e.g., flow) than contextual measures. Contrary to predictions, no significant relationships were found between any of the situational antecedents and the flow state. Accordingly, the relationship between situational motivational antecedents and flow has yet to be understood.

Self-Determination Theory

A contemporary motivational theory that would appear germane for examining this issue is Self-Determination Theory (SDT - Deci & Ryan, 1985, 1991). This motivational perspective is particularly salient for examining the relationship between motivation and flow since it distinguishes among different forms of motivation based on the degree to which they can be considered self-determined. By doing so, SDT allows for a further refinement of the intrinsic/extrinsic or task/ego dichotomies that categorize motivation into one of two types. Deci and Ryan posit there are four main types of motivation existing along a self-determination continuum. From most self-determined to least self-determined, the four forms of motivation are intrinsic motivation, self-determined extrinsic motivation, non self-determined extrinsic motivation, and amotivation. Intrinsic motivation refers to engaging in an activity for its own sake, out of interest, and/or for the pleasure and satisfaction derived from the experience (Deci, 1975). For example, individuals who engage in sport for the fun and enjoyment associated with the activity would be exemplifying intrinsic motivation.

By way of comparison, extrinsic motivation refers to behaviors that are considered means to an end (Deci & Ryan, 1985). The fundamental goals of extrinsically motivated behaviors are to receive rewards and/or avoid punishment. Deci and Ryan further classify extrinsic motivation into two types, namely, self-determined extrinsic motivation and non self-determined extrinsic motivation. Self-determined extrinsic motivation is characterized by engaging in an activity out of personal choice. This type of motivation is typified when individuals willingly participate in an activity (e.g., sport) because it is valued and perceived to be of importance. Non self-determined extrinsic motivation is exhibited when individuals

place pressure upon themselves to perform an activity and/or when their behavior is perceived to be controlled by external factors such as constraints or rewards. Individuals who feel a sense of guilt if they do not engage in physical activity and/or when they exercise due to perceived pressure from others exemplify this type of motivation.

Finally, amotivation is characterized by the absence of intrinsic and extrinsic motivation and is personified when individuals perceive they have no sense of control over their actions. Accordingly, individuals would not derive rewards and/or benefits from their participation in an activity. In many ways, amotivation parallels the concept of learned helplessness (Abramson, Seligman, & Teasdale, 1978). In short, Deci and Ryan (1985, 1991) posit two forms of self-determined motivation (intrinsic motivation and self-determined extrinsic motivation) and two forms of non self-determined motivation (non self-determined extrinsic motivation and amotivation).

As a means of building upon this motivational taxonomy, Vallerand (1997) posited that the different types of motivation exist at three hierarchical levels of generality, namely, global, contextual, and situational. By thus describing motivation, Vallerand has developed a hierarchical framework for assessing the relationship between different levels of motivation and any number of variables. This conceptual framework appears germane for examining specific hypotheses concerning the relationship between situational motivation and flow.

Another reason for using SDT (Deci & Ryan, 1985, 1991) is that it accounts for determinants of motivation. According to them, three motivational determinants are postulated to exist, namely, perceptions of autonomy, perceptions of competence, and perceptions of relatedness. These motivational determinants can be traced directly to the three basic

psychological needs for autonomy, competence, and relatedness, respectively. The need for autonomy refers to individuals' striving to feel they are the origin of their actions and encompasses the notion of choice (deCharms, 1968); the need for competence pertains to individuals' desire to interact proficiently or effectively with the environment; and the need for relatedness refers to individuals' desire to feel connected with others or to experience a sense of belonging in a particular social context.

Past research on flow has revealed that perceptions of competence are positively related to the experience of this psychological state. Jackson and Roberts (1992) found that athletes who reported high levels of perceived competence experienced flow more often than athletes who reported low levels of perceived competence. If perceptions of competence and flow are indeed positively related, then, according to SDT (Deci & Ryan, 1985, 1991), perceptions of autonomy and perceptions of relatedness may also be positively associated with flow states. Thus, in addition to being able to assess the relationship between different types of motivation and flow, SDT would allow for an examination of the link between these three motivational determinants and the experience of this psychological state.

An additional reason for using SDT (Deci & Ryan, 1985, 1991) is that it makes specific predictions concerning motivational consequences. It could thus be used to examine important outcomes such as flow. Indeed, much research has demonstrated that, in line with SDT, the two self-determined forms of motivation (intrinsic motivation and self-determined extrinsic motivation) lead to positive outcomes such as positive emotions (Frederick, Manning, & Morrison, 1996) and health-promoting behaviors (Williams, Grow, Freedman, Ryan, & Deci, 1996), whereas the two non self-determined types of motivation (non self-determined

extrinsic motivation and amotivation) lead to negative outcomes such as dropout (Vallerand, Fortier, & Guay, 1997).

To summarize, SDT (Deci & Ryan, 1985, 1991) appears to be a salient basis for examining the relationship between motivation and flow since it accounts for different types of motivation as well as different levels of motivation, and in particular, situational motivation (Vallerand, 1997). SDT also allows for a thorough examination of the relationship between situational motivational antecedents and the flow state. Finally, SDT has recently been used to examine a number of important outcomes and may thus be used to examine flow. Accordingly, the purpose of the present study was twofold. Its primary purpose was to examine the relationship between different types of situational motivation and flow. The secondary purpose was to assess the relationship between situational determinants of motivation (perceptions of autonomy, perceptions of competence, and perceptions of relatedness) and the experience of this psychological state.

Based on the theoretical postulates underlying SDT (Deci & Ryan, 1985, 1991) as well as past research on motivation (Vallerand, 1997) and flow (e.g., Jackson & Roberts, 1992; Mannell et al., 1988; Stein et al., 1995), we hypothesized that self-determined forms of motivation (intrinsic motivation and self-determined extrinsic motivation) would be positively related to flow, whereas non-self determined forms of motivation (non self-determined extrinsic motivation and amotivation) would be negatively related to this psychological state. We also hypothesized that the three motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness) would be positively and significantly related to the flow state.

Method

Participants

Participants were 203 swimmers (105 males; 98 females) from eight master's level swim clubs. Their average age was 36.4 years with each swimmer having between 1 to 20 years ($M = 4.1$) experience with respective clubs. On average, participants swam 3.7 times per week with approximately half ($n = 111$) participating in competitions on a regular basis. The majority were Caucasian and of Canadian nationality.

Procedures

Permission to conduct this investigation was initially obtained from administrators of the master's level swim clubs during the Fall of 1996. A questionnaire was then administered by a trained researcher immediately following a swim practice. Participants were informed about the general purpose of the study and the voluntary nature of their involvement, and ensured that confidentiality and anonymity would be maintained at all times. The questionnaire required approximately 15 minutes to complete and was administered on the pool deck.

Questionnaire

The questionnaire was composed of a number of previously validated scales adapted to suit the swimming context. It was used here to assess situational motivation, situational motivational determinants, and flow. All items were measured using a 7-point Likert type scale with 1 (strongly disagree) and 7 (strongly agree) representing extreme values.

Situational Motivational Determinants

The following scales were adapted slightly by altering the manner in which the items were phrased. Instead of asking participants to respond in general, these swimmers were asked

to relate how they were feeling during a specific practice. Situational perceptions of autonomy were assessed using three adapted items from the Autonomy Perceptions in Life Contexts Scale (Blais & Vallerand, 1992), an example of which is: "I felt obligated to be at this swim practice." The standardized Cronbach alpha coefficient for this scale was .54. We assessed situational perceptions of competence by using an adapted version of the Perceived Competence Scale for Children (Harter, 1982). This three-item scale yielded a standardized Cronbach alpha coefficient of .69. An example from this scale is: "I felt competent during this swim practice." Finally, situational perceptions of relatedness were assessed using a modified version of the Perceived Relatedness Scale (Richer & Vallerand, 1996). The items are prefaced with the general statement "During this practice, in my relations with the members of my current swim team, I felt..." Examples of the three items used to assess perceived relatedness are: "supported," "attached," and "united." This scale yielded a standardized Cronbach alpha coefficient of .81.

Situational Motivation

The different types of situational motivation were measured using an adapted version of the Situational Motivation Scale (Guay & Vallerand, 1995) composed of four subscales designed to measure intrinsic motivation, self-determined extrinsic motivation, non self-determined extrinsic motivation, and amotivation. Participants were asked to respond to the general question: "Why did you participate in this swim practice?" An example from each four-item subscale is: "Because swimming in this practice was really enjoyable" (intrinsic motivation); "Because I chose to swim for my own benefit" (self-determined extrinsic motivation); "Because I felt I was expected to swim" (non self-determined extrinsic

motivation); and "I don't know; I don't think I gained anything from the experience" (amotivation). Standardized Cronbach alpha coefficients for each of the situational motivation subscales ranged between .73 and .89 (M = .80).

Flow

The Flow State Scale (FSS - Jackson & Marsh, 1996) was used to assess the swimmers' experience of flow. This instrument is composed of nine subscales with each corresponding to a different flow characteristic. The nine FSS subscales along with an example of an item from each are: Challenge-Skill Balance ("I was challenged, but I believed my skills would allow me to meet the challenge"); Action-Awareness Merging ("Things just seemed to be happening automatically"); Clear Goals ("I knew clearly what I wanted to do"); Unambiguous Feedback ("I had a good idea while I was performing about how well I was doing"); Concentration on the Task at Hand ("My attention was focused entirely on what I was doing"); Sense of Control ("I had a feeling of total control"); Loss of Self-Consciousness ("I was not concerned with what others may have been thinking of me"); Transformation of Time ("It felt like time stopped while I was performing"); and Autotelic Experience ("The experience left me feeling great"). Each subscale was measured using four items. Standardized Cronbach alpha coefficients for the nine subscales ranged between .76 and .89 (M = .84). A general measure of flow was also computed by combining the nine subscales and yielded an alpha coefficient of .94.

Results

Situational Motivation and Flow

Pearson Correlations Between Different Types of Situational Motivation and Flow

Results of the correlational analysis (Table 1) revealed that flow was significantly and positively related to intrinsic motivation, (r = .60, p < 0.01) and self-determined extrinsic motivation (r = .44, p < 0.01). A significant, negative, and lower correlation was obtained between flow and amotivation (r = -.20, p < 0.01) and a nonsignificant association was found between non self-determined extrinsic motivation and the experience of this psychological state (r = -.08, p = .259).

Insert Table 1 about here

With respect to the individual characteristics of flow, significant and positive relationships were found between the nine FSS subscales and the two self-determined types of motivation with the exception of the correlations between self-determined extrinsic motivation and loss of self-consciousness (r = .09, p = .207) and transformation of time (r = .11, p = .108), which were both nonsignificant. Non self-determined extrinsic motivation was nonsignificantly related to the nine flow subscales with the exception of its association with clear goals (r = -.14, p < .05) and concentration on the task at hand (r = -.23, p < .01), which were both negative and significant. Amotivation was negatively and significantly related to challenge-skill balance (r = -.30, p < .01), clear goals (r = -.26, p < .01), concentration on the task at hand (r = -.30, p < .01), sense of control (r = -.22, p < .01), and autotelic experience (r = -.31, p < .01) and was positively and significantly associated with transformation of time (r = .18, p < .05). The remainder of the flow subscales were nonsignificantly correlated with this type of motivation.

Group Differences Between High and Low Incidence of Flow Groups with respect to

Situational Motivation

We also compared the different types of situational motivation between two groups; those reporting a high incidence of flow and those reporting a low incidence of this psychological state. The high and low groups were created based on participants' overall scores on the FSS. In this regard, participants' scores were initially divided into three groups corresponding to the 33rd and 66th percentile scores. Scores above the 66th percentile were included in the high incidence of flow group (n = 67). Scores below the 33rd percentile were included in the low incidence of flow group (n = 68). Scores between the 33rd and 66th percentiles (n = 68) were omitted from the analysis.

Results of the multiple t-tests[1] (Table 2) revealed that those athletes who reported a high incidence of flow had significantly higher levels of intrinsic motivation (t (112) = - 9.12, $p < 0.001$) and self-determined extrinsic motivation (t (105) = -5.87, $p < 0.001$) than those athletes reporting a low incidence of flow. No significant differences were found between the high and the low flow groups in terms of non self-determined extrinsic motivation (t (127) = .69, p = .491) and amotivation (t (114) = 2.45, p = .016).

Insert Table 2 about here

Situational Motivational Determinants and Flow

Pearson Correlations Between Situational Motivational Determinants and Flow

The correlational analysis (Table 1) indicated that the overall measure of flow was significantly and positively associated with perceptions of relatedness (r = .53, $p < 0.01$), perceptions of competence (r = .46, $p < 0.01$), and perceptions of autonomy (r = .19, $p <$

0.01).

In terms of the individual flow characteristics, positive and significant relationships were found between the three situational motivational determinants and the nine FSS subscales with the exception of the correlations between perceived autonomy and challenge-skill balance (r = .11, p = .131), action-awareness merging (r = .07, p = .291), loss of self-consciousness (r = .10, p = .154), and transformation of time (r = -.03, p = .697), the associations between perceived competence and loss of self-consciousness (r = .13, p = .057) and transformation of time (r = -.07, p = .290), as well as the correlation between perceived relatedness and transformation of time (r = .11, p = .133), which were all nonsignificant. Results further revealed that perceived competence and perceived relatedness were more positively related to 8 of the 9 FSS subscales than perceived autonomy. The only exception in this regard was the transformation of time subscale which did not adhere to this pattern.

Group Differences Between High and Low Incidence of Flow Groups with respect to Situational Motivational Determinants

Multiple t-tests (Table 2) revealed that participants in the high incidence of flow group reported significantly higher levels of perceived competence (t (126) = - 6.83, $p < 0.001$) and perceived relatedness (t (121) = - 7.15, $p < 0.001$) than those in the low incidence of flow group. No significant difference was found between the high and low flow groups with respect to perceived autonomy (t (126) = -1.84, p = .068).

Discussion

Overall, results demonstrated that, in line with predictions, swimmers who were

motivated in a self-determined manner (i.e., who engaged in practice for the pleasure and/or satisfaction associated with the activity or who chose to participate for their own benefit) reported the highest instances of flow. Conversely, swimmers who were motivated in a non self-determined manner (i.e., who participated in practice due to internal and/or external pressures, or who were not intrinsically or extrinsically motivated) reported the lowest instances of this psychological state. These findings suggest that self-determined forms of motivation may facilitate flow, whereas non self-determined forms of motivation may have a detrimental influence on flow states.

The results are congruent with the theoretical postulates underlying SDT (Deci & Ryan, 1985, 1991) and concur with the results of past studies in which intrinsic motivation has been positively associated with flow (e.g., Csikszentmihalyi & LeFevre, 1989; Graef et al., 1983; Haworth & Hill, 1992). Findings also support a number of investigations in which self-determined forms of motivation have been linked to desirable outcomes such as academic performance (Fortier, Vallerand, & Guay, 1995), maintenance of health promoting behaviors (Williams et al., 1996), persistence (Vallerand et al., 1997), and positive emotions (Frederick et al., 1996). In addition, results demonstrated that situational motivation, and in particular, situational self-determined forms of motivation, were positively related to flow. This basic finding runs contrary to the results of Stein et al. (1995) who questioned whether situational motivational antecedents are associated with flow states, and whether antecedents of flow could, in fact, be identified (p. 134). The results here clearly suggest that situational motivation is linked with flow and that motivational antecedents of the flow state may indeed be identifiable.

The current investigation also enables us to better understand past research on motivation and flow. More specifically, in the leisure study conducted by Mannell et al. (1988), it was found that individuals who were extrinsically motivated but freely chose to engage in leisure activities reported the highest instances of flow. These researchers concluded that this finding was unexpected and ran contrary to expectations. However, when examined in light of SDT (Deci & Ryan, 1985, 1991), their results are congruent with those of the present investigation. Mannell et al. assessed extrinsic motivation using two questions related to performing an activity: a) for one's long-term benefit, and (b) for others. According to SDT, individuals who freely chose to engage in an activity for their long-term benefit are exemplifying self-determined extrinsic motivation which should be positively related to any number of desirable outcomes including the experience of flow. In the current study, a significant and positive relationship was indeed found between self-determined extrinsic motivation and the experience of this psychological state. Results of the current investigation thus support the findings of Mannell et al. and serve to clarify the link between these two variables.

In terms of the individual characteristics of flow, the present findings suggest that loss of self-consciousness and transformation of time may be less sensitive to the different types of situational motivation than the other flow characteristics, perhaps because of ambiguity concerning the individual characteristics of flow. Specifically, it is possible that certain components of flow are characteristics, whereas others may act as antecedents of this psychological state. This may also be due to the nature of the swimming context; possibly these two individual flow characteristics may be less salient in the swimming context than in

other settings. Future studies may do well to explore these possibilities.

With regards to the secondary purpose of the study, we assessed the relationship between situational determinants of motivation and the flow state. The results are in line with predictions and congruent with the contention that perceived autonomy, perceived competence, and perceived relatedness are important psychological needs (Deci & Ryan, 1985, 1991). The findings are also in accordance with the results of past research in which perceived competence and flow have been positively linked (e.g., Jackson & Roberts, 1992). However, results of the current investigation are inconsistent with those obtained by Stein et al. (1995) who found no significant link between situational perceptions of competence and flow. Our findings suggest these variables are indeed positively related and indicate that situational perceptions of competence may act as an antecedent of flow.

Results of the present study also revealed that swimmers who felt most connected with teammates reported high instances of this psychological state. While the social nature of flow has received a limited amount of attention, feeling close or united with those around us may be an important variable in the experience of flow states. Future studies may do well to assess the social nature of flow in group settings such as team sports or interpersonal relations. In addition, the manner in which perceptions of autonomy were related to the experience of flow seems to indicate that motivational determinant may be less important to swimmers' experience of flow than perceived competence or perceived relatedness. Since no study to date has examined the relationship between perceived autonomy and flow, additional research is needed in order to assess this possibility.

From the vantage point of the individual characteristics of flow, similar to what was

found with respect to the different types of situational motivation, transformation of time was not associated with the three motivational determinants in the same manner as the other flow characteristics. Again, this may be due to the manner in which the different characteristics of flow are formulated and/or the nature of the swimming context.

When interpreting the results of the present study, it is important to consider a number of limitations. First, all variables were assessed at a single point in time. As such, it is not possible to draw conclusions regarding directionality/causal links between any of the measured variables. It may be that situational motivation and the three motivational determinants may directly influence flow or that the experience of flow may directly affect these motivational variables. It is also possible that a bidirectional relationship exists in this regard. Future studies in which the direction/causal nature of the relationships between situational motivational variables and flow are examined would therefore seem needed.

Second, results of the present study are limited by the scope of this investigation. Since the experience of flow was examined in the context of master's level swimming, transferring these findings across settings should be performed with caution. We also acknowledge that our findings may not be generalized due to the limited number of participants involved.

Finally, a limited number of variables were assessed in the current investigation. We attempted to limit our study of flow to a strictly motivational perspective using the theoretical postulates underlying SDT (Deci & Ryan, 1985, 1991). There are certainly numerous other variables, including those of a motivational nature, that may also be associated with or have an important influence on flow. Future studies in which additional variables are examined, whether motivational or otherwise, may thus illuminate understanding of this psychological

state. In this regard, testing an extended model of flow may be a fruitful avenue to pursue.

References

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Blais, M. R., & Vallerand, R. J. (1992). Développement et validation de l'échelle des perceptions d'autonomie dans les domains de vie [Development and validation of the autonomy perception in life contexts scale]. Unpublished manuscript, Université du Québec à Montréal.

Carli, M., Delle Fave, A., & Massimini, F. (1988). The quality of experience in the flow channels: Comparison of Italian and U.S. students. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), Optimal experience: Psychological studies of flow in consciousness (pp. 288-306). New York: Cambridge University Press.

Csikszentmihalyi, M. (1975a). Beyond boredom and anxiety. San Francisco, CA: Jossey-Bass.

Csikszentmihalyi, M. (1975b). Play and intrinsic rewards. Journal of Humanistic Psychology, 15, 41-63.

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. New York: HarperPerennial.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. Journal of Personality and Social Psychology, 56, 815-822.

Csikszentmihalyi, M., Rathunde, K., & Whelan, S. (1993). Talented teenagers: The roots of success and failure. New York: Cambridge University Press.

deCharms, R. (1968). Personal causation: The internal affective determinants of

behavior. New York: Academic Press.

Deci, E. L. (1975). Intrinsic motivation. New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum Press.

Deci. E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), Nebraska symposium on motivation: Vol. 38. Perspectives on motivation (pp. 237-288). Lincoln, NE: University of Nebraska Press.

Farthing, G. W. (1992). The psychology of consciousness. Englewood Cliffs, NJ: Prentice-Hall.

Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic motivation and school performance: Toward a structural model. Contemporary Educational Psychology, 20, 257-274.

Frederick, C. M., Manning, T., & Morrison, C. (1996). Motivation to participate, exercise affect, and outcome behaviors toward physical activity. Perceptual and Motor Skills, 82, 691-701.

Graef, R. M., Csikszentmihalyi, M., & McManama-Gianinno, S. (1983). Measuring intrinsic motivation in everyday life. Leisure Studies, 2, 155-168.

Grove, J. R., & Lewis, M. A. E. (1996). Hypnotic susceptibility and the attainment of flowlike states during exercise. Journal of Sport & Exercise Psychology, 18, 380-391.

Guay, F., & Vallerand, R. J. (1995, June). The situational motivation scale. Paper presented at the annual convention of the American Psychological Society, New York.

Harter, S. (1982). The perceived competence scale for children. Child Development,

53, 87-97.

Haworth, J. T., & Hill, S. (1992). Work, leisure, and psychological well-being in a sample of young adults. Journal of Community & Applied Psychology, 2, 147-160.

Jackson, S. A. (1992). Athletes in flow: A qualitative investigation of flow states in elite figure skaters. Journal of Applied Sport Psychology, 4, 161-180.

Jackson, S. A. (1995). Factors influencing the occurrence of flow state in elite athletes. Journal of Applied Sport Psychology, 7, 138-166.

Jackson, S. A., & Marsh, H. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. Journal of Sport & Exercise Psychology, 18, 17-35.

Jackson, S. A., & Roberts, G. C. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. The Sport Psychologist, 6, 156-171.

Larson, R. (1988). Flow and writing. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), Optimal experience: Psychological studies of flow in consciousness (pp. 150-171). New York: Cambridge University Press.

Lee, P. R., Ornstein, R. E., Galin, D., Deikman, A. J., & Tart, C. T. (Eds.). (1976). Symposium on consciousness. New York: Viking Press.

Mannell, R. C., Zuzanek, J., & Larson, R. (1988). Leisure states and "flow" experiences: Testing perceived freedom and intrinsic motivation hypotheses. Journal of Leisure Research, 20, 289-304.

Massimini, F., Csikszentmihalyi, M., & Delle Fave, A. (1988). Flow and biocultural evolution. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), Optimal experience:

Psychological studies of flow in consciousness (pp. 60-81). New York: Cambridge University Press.

Nakamura, J. (1988). Optimal experience and the uses of talent. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), Optimal experience: Psychological studies of flow in consciousness (pp. 319-326). New York: Cambridge University Press.

Richer, S., & Vallerand, R. J. (1996). Construction et validation de l'échelle du sentiment d'appartenance social (ÉSAS) [Construction and validation of the Perceived Relatedness Scale]. Manuscript submitted for publication.

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. Journal of Consulting and Clinical Psychology, 43, 56-67.

Stein, G. L., Kimiecik, J. C., Daniels, J., & Jackson, S. A. (1995). Psychological antecedents of flow in recreational sport. Personality and Social Psychology Bulletin, 21, 125-135.

Tart, C. T. (1975). States of consciousness. New York: E. P. Dutton.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), Advances in experimental social psychology (Vol. 29, pp. 271-360). New York: Academic Press.

Vallerand, R. J., Fortier, M. S., & Guay. F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. Journal of Personality and Social Psychology, 72, 1161-1176.

Wells, A. J. (1988). Self-esteem and optimal experience. In M. Csikszentmihalyi, & I.

S. Csikszentmihalyi (Eds.), Optimal experience: Psychological studies of flow in consciousness (pp. 327-341). New York: Cambridge University Press.

Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. Journal of Personality and Social Psychology, 70, 115-126.

Wolman, B. B., & Ullman, M. (Eds.). (1986). Handbook of states of consciousness. New York: Van Nostrand Reinhold.

Footnotes

1. In order to correct for Type I errors, an adjusted alpha-level of .007 was calculated by dividing the desired alpha level (.05) by the number of significance tests performed (7).

Table 1

Pearson Correlations Between Different Types of Situational Motivation, Situational Motivational Determinants, and Flow

Variable	Flow	Skill	Merg	Goal	Feed	Conc	Cont	Self	Time	Auto
IM	.60**	.54**	.24**	.46**	.27**	.47**	.44**	.22**	.25**	.75**
SDEM	.44**	.43**	.16*	.43**	.34**	.39**	.37**	.09	.11	.42**
NSDEM	-.08	-.03	.07	-.14*	-.08	-.23**	-.09	.01	.10	-.13
AMO	-.20**	-.30**	-.02	-.26**	-.12	-.30**	-.22**	.02	.18*	-.31**
Autonomy	.19**	.11	.07	.16*	.15*	.25**	.21**	.10	-.03	.16*
Competence	.46**	.63**	.27**	.35**	.26**	.32**	.50**	.13	-.07	.47**
Relatedness	.53**	.50**	.24**	.46**	.41**	.47**	.35**	.25**	.11	.49**

Note. *$p < .05$. **$p < .01$. $n = 203$.

Situational Motivational Variables. IM = intrinsic motivation; SDEM = self-determined extrinsic motivation; NSDEM = non self-determined extrinsic motivation; AMO = amotivation; Autonomy = perceptions of autonomy; Competence = perceptions of competence; Relatedness = perceptions of relatedness. Flow Variables. Flow = overall measure of flow; Skill = challenge-skill balance; Merg = action-awareness merging; Goal = clear goals; Feed = unambiguous feedback; Conc = concentration on the task at hand; Cont = sense of control; Self = loss of self-consciousness; Time = transformation of time; Auto = autotelic experience.

Table 2

Comparison Between High and Low Incidence of Flow Groups with respect to Different Types of Situational Motivation and Situational Motivational Determinants

	Low Flow (n = 68)		High Flow (n = 67)			
	M	SD	M	SD	t	p
IM	4.58	1.18	6.14	.76	-9.12	.000
SDEM	5.65	.89	6.39	.51	-5.87	.000
NSDEM	2.96	1.66	2.78	1.36	.69	.491
AMO	1.67	.94	1.33	.61	2.45	.016
Autonomy	4.42	1.52	4.85	1.21	-1.84	.068
Competence	4.72	.98	5.76	.78	-6.83	.000
Relatedness	4.43	1.16	5.68	.84	-7.15	.000

Note. The modified Bonferonni alpha-level was .007.

Situational Motivational Variables. IM = intrinsic motivation; SDEM = self-determined extrinsic motivation; NSDEM = non self-determined extrinsic motivation; AMO = amotivation; Autonomy = perceptions of autonomy; Competence = perceptions of competence; Relatedness = perceptions of relatedness.

Running Head: MOTIVATIONAL MODEL OF FLOW

Towards a Motivational Model of Flow:
Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation

John Kowal and Michelle S. Fortier

University of Ottawa

Ottawa, Ontario, Canada

Author Note

John Kowal, School of Human Kinetics; Michelle S. Fortier, Ph.D., School of Human Kinetics.

We would like to thank Karrie Hamilton, Carol Stroud, and Mark Grenier for their assistance with the data collection.

Correspondence concerning this article should be addressed to Michelle S. Fortier, Ph.D., School of Human Kinetics, University of Ottawa, 125 University, P.O. Box 450, Stn. A, Ottawa, Ontario, Canada, K1N 6N5.

Abstract

The purpose of this study was to propose and test a motivational model of flow based on Vallerand's (1997) Hierarchical Model of Intrinsic and Extrinsic Motivation. One hundred and four Canadian master's level swimmers completed questionnaires on two separate occasions, Time 1 and Time 2. At Time 1, situational measures of distal motivational determinants (perceptions of success and perceptions of the motivational climate), proximal motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness), self-determined motivation, and flow were assessed immediately following a swim practice. Contextual measures of these same variables were assessed at Time 2 (one week later) with the exception of flow. Results of a path analysis supported a number of links in the hypothesized model. Findings are discussed in light of research and theory on motivation and flow and directions for future research are presented.

Towards a Motivational Model of Flow: Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation

Why do certain individuals invest thousands of hours of time and energy in seemingly pointless physical activities? What inspires athletes to push themselves to the point of physical and mental exhaustion? Or, why do certain people persist in exercise regimes while others drop-out at alarming rates? The answers to such questions lie at the heart of motivation.

Over the past few decades, one theoretical framework that has proven to be a salient basis for examining motivation towards sport and physical activity is Self-Determination Theory (SDT - Deci & Ryan, 1985, 1991). Indeed, this conceptual approach has been used in numerous investigations conducted in sport and exercise contexts (see Deci & Ryan, 1985, chapter 12; Frederick & Ryan, 1995; Vallerand, 1993; Vallerand, Deci, & Ryan, 1987 for reviews) and has been found to be a valid and useful framework in this domain. SDT is particularly well-suited for examining motivation given that it distinguishes among different forms of motivation based on the degree to which they can be considered self-determined. By classifying motivation in this way, the intrinsic/extrinsic or task/ego dichotomies that necessitate a categorization of motivation into one of two types is refined. SDT also describes motivation as a process beginning with determinants and ending with consequences. This determinants --> motivation --> consequences sequence is useful because it allows for a comprehensive assessment of the initiation of motivation and the outcomes thereof. In this regard, SDT has recently been used to examine important outcomes in the physical activity context such as positive emotions (Frederick, Manning, & Morrison, 1996), persistence (Fortier & Grenier, in press; Pelletier, Fortier, Vallerand, & Brière, 1997), and sportsmanship

attitudes (Vallerand & Losier, 1994).

As a means of integrating the theoretical tenets underlying SDT with research on motivation (Csikszentmihalyi & Nakamura, 1989; Harter, 1978; Lepper & Greene, 1978), Vallerand (1997) recently proposed a Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM). This theoretical model posits that three main types of motivation exist (i.e., intrinsic motivation, extrinsic motivation, and amotivation), that they are present at three different levels of generality (global, contextual, and situational), that they are influenced by specific determinants, that they lead to various outcomes, and that the different levels are interrelated. Scores of investigations have supported a number of the individual links in this model (Vallerand, 1993, 1997). A few studies have also assessed a number of relationships in the same investigation (Blanchard, Vallerand, & Provencher, 1995; Chantal, Guay, & Vallerand, 1996; Vallerand & Guay, 1996). While results of these studies are encouraging in that many theoretical predictions were supported, future research is needed in order to further validate the HMIEM. It would seem particularly important to test this model in sport and physical activity settings given its potential to forward our understanding of motivation towards these activities.

Accordingly, the purpose of this study was to propose and test a Motivational Model of Flow in a physical activity context. This model is based on Vallerand's (1997) HMIEM as well as past research on motivation (Blanchard & Vallerand, 1996a, 1996b; Seifriz, Duda, & Chi, 1992) and flow (Csikszentmihalyi, 1990; Csikszentmihalyi, Rathunde, & Whelan, 1993; Jackson, 1995; Jackson & Roberts, 1992; Stein, Kimiecik, Daniels, & Jackson, 1995).

The Motivational Model of Flow

The proposed model is presented in Figure 1. Prior to describing this model, it should initially be mentioned that in the present study, only two levels of generality were examined (contextual and situational) and the flow state was identified as a single consequence of situational motivation. This model can be summarized in six basic propositions. First, at each hierarchical level, perceptions of a mastery motivational climate are posited to positively influence perceptions of autonomy, competence, and relatedness, whereas perceptions of a performance motivational climate are posited to negatively influence these variables. Second, at each hierarchical level, perceptions of past success are postulated to have a positive impact on perceptions of competence. Third, at each hierarchical level, perceived autonomy, competence, and relatedness are posited to positively influence self-determined motivation. Fourth, situational self-determined motivation is postulated to have a positive influence on contextual self-determined motivation. Fifth, situational self-determined motivation is posited to positively impact the experience of flow. Finally, flow is posited to positively influence contextual self-determined motivation. The theoretical and empirical evidence supporting the various links in the proposed model are presented in the following paragraphs. However, before reviewing the literature, we will initially define and explain the concept of self-determined motivation.

Insert Figure 1 about here

Self-Determined Motivation Towards Physical Activity

According to SDT/HMIEM, motivation may be intrinsic, extrinsic, or amotivated. Intrinsic motivation refers to engaging in an activity (e.g., physical activity) for its own sake,

out of interest, and/or for the pleasure and satisfaction derived from the experience (Deci, 1975). While this type of motivation has typically been regarded as a global construct, Vallerand and colleagues (Vallerand, Blais, Brière, & Pelletier, 1989, Vallerand et al., 1992, 1993) have identified three conceptually distinct forms of intrinsic motivation, namely, intrinsic motivation to know, toward accomplishments, and to experience stimulation. Intrinsic motivation to know refers to participating in an activity for the pleasure and satisfaction experienced through learning, exploring, or trying to understand something new. An example of this type of motivation is illustrated when an athlete experiences pleasure by seeking out new and innovative ways to improve his/her athletic performance. Intrinsic motivation toward accomplishment is characterized by the enjoyment experienced while trying to accomplish a task or surpass a previous level of achievement. An athlete who attempts to master a particular skill for fun would be exemplifying this type of intrinsic motivation. Finally, Intrinsic motivation to experience stimulation is characterized by performing an activity to seek out sensory pleasure and/or live an exhilarating experience. An example is personified by an athlete who thrives on feelings of elation experienced through physical exertion or participation in a particular activity.

The second major category of motivation is extrinsic motivation. This type of motivation refers to a wide range of behaviors that can be considered means to an end (Deci & Ryan, 1985). The fundamental goals of extrinsically motivated behaviors are to receive rewards and/or to avoid punishment. According to Deci and Ryan and colleagues (Deci & Ryan, 1985, 1991; Ryan, Connell, & Grolnick, 1990) extrinsic motivation may be classified into at least three different forms situated on a self-determination continuum. From lower to

higher levels of self-determination, the three forms of extrinsic motivation are external regulation, introjection, and identification. External regulation refers to behaviors that are controlled or regulated by external sources such as material rewards, constraints, and/or pressures. An individual who participates in physical activity due to perceived pressures from peers, parents, or coaches would be typifying this form of extrinsic motivation. Introjection is exemplified by individuals who place pressure upon themselves to perform a given activity. In this regard, external pressures have replaced internal ones. For example, introjection is characterized by an individual who feels guilty if he/she does not perform physical activity. Finally, identification refers to behaviors that are valued by individuals and performed out of choice. This type of motivation is extrinsic because the activity is performed as a means to an end yet it is self-determined in that individuals choose to engage in the activity. By way of example, identification is personified by an athlete who willingly participates in sport because he/she values this activity and believes it to be important.

The last type is amotivation which is characterized by the absence of intrinsic and extrinsic motivation. It occurs when an individual feels he/she has no control over his/her actions. In this regard, the individual would not derive rewards or benefits from involvement in physical activity. As a construct, amotivation can be considered conceptually similar to learned helplessness (Abramson, Seligman, & Teasdale, 1978).

In short, Deci and Ryan (1985, 1991) and Vallerand (1997) posit seven different types of motivation. There are four forms of self-determined motivation; from higher to lower levels of self-determination, they are the three types of intrinsic motivation (to know, toward accomplishments, and to experience stimulation) and identification. There are also three forms

of non self-determined motivation which, in terms of higher to lower levels of self-determination, are: introjection, external regulation, and amotivation. A number of studies have supported this motivational taxonomy in sport and physical activity settings (Brière, Vallerand, Blais, & Pelletier, 1995; Pelletier et al., 1995). Although it is useful to examine the seven types of motivation on an individual basis, researchers such as Vallerand (1993) have assessed the different motivational types in terms of a general orientation by regrouping them into a general motivational profile or index. Individuals with a self-determined motivational profile engage in sport or physical activity out of personal choice (identification) and/or for the pleasure and satisfaction derived from the experience (intrinsic motivation), whereas individuals with a non self-determined motivational profile engage in sport or physical activity as a result of internal controls (introjection), and/or external pressures (external regulation), or would not be motivated to do so (amotivation).

According to the HMIEM (Vallerand, 1997), the different types of motivation are posited to exist at three hierarchical levels of generality, namely global, contextual and situational. Global motivation refers to a trait-like measure of motivation is posited to be the most stable of the three types. Contextual motivation is characterized by a general orientation towards a specific context or life domains (e.g., sport and physical activity), and is considered relatively stable although subject to environmental influences. Situational motivation is a state-specific measure referring to motivation while currently engaged in an activity and is considered much less stable than contextual motivation.

Motivational Determinants

In line with SDT/HMIEM, motivation at each hierarchical level is posited to be

directly influenced by proximal determinants and indirectly influenced by distal determinants.

Distal Determinants

Distal determinants refer to factors in the social context which are posited to influence motivation through their impact on three proximal motivational determinants (perceived autonomy, perceived competence, and perceived relatedness) (Deci & Ryan, 1985, 1991). Social factors that increase one or more proximal determinant should enhance self-determined motivation and undermine non self-determined motivation, whereas social factors that decrease one or more of these determinants should promote non self-determined motivation and undermine self-determined motivation.

The Impact of Perceptions of the Motivational Climate on the Proximal Determinants of Motivation. A variable that has been included in the proposed model as a distal determinant of motivation is perceptions of the motivational climate. Two basic motivational climates that have been identified in the literature, namely, a mastery motivational climate and a performance motivational climate (Ames, 1992; Ames & Archer, 1988; Roberts, 1992). A mastery motivational climate refers to a social context in which mastering a task, learning and/or improving one's ability are emphasized. A performance motivational climate is characterized by an emphasis on performance outcomes and/or surpassing the accomplishments of others.

While several studies (Ames, 1992; Ames & Archer, 1988; Seifriz et al., 1992) have found a mastery motivational climate to be positively related to a task-involved goal-orientation (a construct similar to self-determined motivation), no study to date has examined its link with perceived autonomy or perceived relatedness, and only a limited number of

investigations have assessed its relationship with perceptions of competence. For example, Kavussanu and Roberts (1996) found a positive relationship between perceptions of a mastery motivational climate and perceptions of competence in a study conducted in a physical activity setting. Similar results were obtained in the educational context by Ames (1992) and Ames and Archer (1988). Given the theoretical implications of autonomy, competence, and relatedness as fundamental psychological needs (Deci & Ryan, 1985, 1991), it was thought the impact of perceptions of the motivational climate on motivation would be mediated by these three variables. That is, perceptions of the motivational climate would have a direct influence on perceived autonomy and perceived relatedness. It is important to note that while each of the aforementioned studies (Kavussanu & Roberts, 1996; Ames, 1992; Ames & Archer, 1988) was conducted at a contextual level, no study to date has been conducted at a situational level. Based on the theoretical relationships postulated in the HMIEM (Vallerand, 1997), it was thought similar links would be obtained at a state-specific level.

The Impact of Perceptions of Past Success on Perceptions of Competence. Perceptions of past success have also been included as a distal motivational determinant but are only posited to directly influence perceived competence. This postulated link stems from Bandura's (1986) Social Cognitive Theory which predicts that the more individuals perceive themselves as having been successful in the past, the more they will perceive themselves as being self-efficacious (competent). Empirical support for the positive link between contextual measures of perceived success and feelings of self-efficacy/competence has been found in a number of studies conducted in sport and physical activity settings (Brody, Hatfield, & Spalding, 1988; Feltz, 1988; Feltz & Mugno, 1983). More recent work in this domain has yielded similar

results (Vlachopoulos, Biddle, & Fox, 1996). Although no study has assessed this relationship at a situational level, it was posited that a similar link would exist at this level of generality.

Proximal Determinants

According to SDT/HMIEM, three proximal determinants of motivation exist, namely, perceptions of autonomy, perceptions of competence, and perceptions of relatedness. Perceptions of autonomy refer to the need to feel one is the origin of one's actions and encompasses the notion of choice (see deCharms, 1968); perceptions of competence are related to the need to feel able to interact proficiently or effectively with the environment; and perceptions of relatedness refer to the need to feel connected with others and/or a sense of belonging in a particular social context. In line with SDT/HMIEM, it is predicted that changes in one or more of the three proximal determinants will effect changes in motivation at the respective level of generality. Specifically, increases in perceived autonomy, competence, or relatedness should promote self-determined motivation and undermine non self-determined motivation. Conversely, decreases in one or more of the three proximal determinants should undermine self-determined motivation and promote non self-determined motivation.

The Impact of Perceived Autonomy, Competence, and Relatedness on Self-Determined Motivation. In terms of the individual links postulated in the Motivational Model of Flow, support for the positive relationship between contextual measures of perceived autonomy and intrinsic motivation was found by Thompson and Wankel (1980) in a study conducted in physical fitness classes. Similar findings have also been obtained at a contextual level in academic settings (Fortier, Vallerand, & Guay, 1995; Guay & Vallerand, 1996; Losier et al., 1996; Vallerand & Guay, 1996; Vallerand, Fortier, & Guay, 1997) and at the situational level

in other life domains (Blanchard & Vallerand, 1996a, 1996b; Reeve & Deci, 1996).

The positive relationship between contextual measures of perceived competence and self-determined motivation was found in the context of sport and physical activity by Frederick and Ryan (1991) and Brustad (1988). These findings have also been supported in educational settings (Fortier et al., 1995; Guay & Vallerand, 1996; Losier et al., 1996; Vallerand & Guay, 1996; Vallerand et al., 1997). At the situational level, similar results have been obtained in sporting contexts (Blanchard & Vallerand, 1996a, 1996b; Vallerand & Reid, 1984, 1988) and in an academic setting (Reeve & Deci, 1996).

Finally, a positive link between perceived relatedness and self-determined motivation was found at a situational level by Blanchard and Vallerand (1996a, 1996b) in two studies conducted in the context of sport and physical activity. Apart from these studies, no investigation to date has assessed this relationship in this particular life domain at a situational or contextual level. However, support for this link at a contextual level of generality was obtained in the education context (Guay & Vallerand, 1996; Losier et al., 1996) and in work settings (Richer & Vallerand, 1996).

The Impact of Situational Self-Determined Motivation on Flow

In addition to describing distal and proximal determinants of motivation, SDT/HMIEM accounts for motivational consequences. Specifically, self-determined motivation is posited to bring about more positive consequences than non self-determined motivation at each hierarchical level. Support for this contention has been found in numerous studies in which self-determined forms of contextual motivation and related constructs (i.e., a task-involved goal-orientation) have been positively related to a wide range of desirable outcomes including

enjoyment (Frederick et al., 1996; Seifriz et al., 1992), fun (Wankel & Sefton, 1989), positive emotions (Frederick et al., 1996), satisfaction (Vallerand et al., 1989, 1993; Walling, Duda, & Chi, 1993), persistence (Fortier & Grenier, in press; Pelletier et al., 1997; Vallerand & Guay, 1996), and sportsmanship attitudes (Vallerand & Losier, 1994). Similar findings have been found at a situational level with respect to academic persistence (Vallerand & Guay, 1996).

Another variable that has been of interest to researchers, especially in terms of its link with motivation, is the experience of flow. Past research has suggested that motivation may facilitate flow states (Jackson, 1992, 1995; Massimini, Csikszentmihalyi, & Delle Fave, 1988). A number of studies have also demonstrated that self-determined forms of motivation (i.e., intrinsic motivation) and related constructs (i.e., a task-involved goal-orientation) are positively associated with flow (Csikszentmihalyi & LeFevre, 1989; Graef, Csikszentmihalyi, & McManama-Gianinno, 1983; Haworth & Hill, 1992; Iso-Ahola, 1979; Jackson & Roberts, 1992; Kowal & Fortier, in press). Although it would appear that a positive link between these variables exists, what has yet to be clarified is the relationship between situational motivation and flow. In three prospective studies conducted in physical activity settings, Stein et al. (1995) attempted to predict flow states using situational measures of motivation. Contrary to expectations, no significant relationship were found. Future studies would therefore seem necessary in order to address this ambiguity.

The Impact of Situational Self-Determined Motivation on Self-Determined Contextual Motivation

As proposed by the HMIEM (Vallerand, 1997), situational motivation should have a

recursive, bottom-up influence on contextual motivation. More specifically, individuals whose motivation is self-determined while participating in a particular sport (i.e., at the situational level) should become more self-determined towards sport in general (i.e., at the contextual level). Empirical support for this relationship, although limited, was found by Blanchard et al. (1995) in a longitudinal study conducted in a basketball setting. Results revealed that the more athletes' motivation was self-determined at a situational level, the more it was subsequently self-determined at a contextual level.

The Influence of Flow on Contextual Self-Determined Motivation

In addition to being influenced by situational motivation, flow is posited to have a recursive, bottom-up influence on contextual motivation. This relationship is based on the theoretical postulates linking motivation to flow (Deci & Ryan, 1985) and flow to a number of positive outcomes (Csikszentmihalyi, 1990; Csikszentmihalyi & Rathunde, 1993). It is also supported by the findings of Csikszentmihalyi et al. (1993) which revealed that flow was positively related to teenagers' motivation to seek out opportunities to enhance their skills and abilities. Moreover, findings from a number of studies (Csikszentmihalyi & LeFevre, 1989; Graef et al., 1983; Haworth & Hill, 1992; Iso-Ahola, 1979; Jackson & Roberts, 1992, Kowal & Fortier, in press) in which flow and self-determined forms of motivation were positively linked further support this prediction. It should also be underscored that although the link between motivational consequences at one hierarchical level and self-determined forms of motivation at another hierarchical level was not originally delineated in the HMIEM (Vallerand, 1997), it was proposed and assessed in the current investigation. This relationship is of particular importance given its potential to forward understanding with respect to how

these variables are linked.

The Present Study

Although numerous studies have independently examined the relationship between the different components of the proposed model, no study to date has assessed this model in its entirety. Accordingly, the purpose of the present investigation was to test a Motivational Model of Flow using a two-wave, time-lagged design. Based on the proposed model, it was hypothesized that the model would be found to be valid, that is, the proposed links would be significant and in the expected direction. More specifically, we hypothesized that: (a) at each hierarchical level, the more individuals perceived the motivational climate as being mastery-oriented, the more they would perceive themselves as being autonomous, competent, and related, and the more their motivation would be self-determined; (b) at each hierarchical level, the more individuals perceived the motivational climate as being performance-oriented, the less they would perceive themselves as being autonomous, competent, and related, and the less their motivation would be self-determined; (c) at each hierarchical level, the more individuals perceived their past sporting experience as having been successful, the more they would perceive themselves as being competent; (d) at each hierarchical level, the more individuals perceived themselves as being autonomous, competent, and related, the more their motivation would be self-determined; (e) the more individuals' motivation was self-determined at the situational level, the more they would experience flow; (f) the more individuals were motivated in a self-determined manner at the situational level, the more they would be motivated in a self-determined manner at the contextual level; and (g) the more individuals experienced flow at the situational level, the more their motivation would be self-determined at

the contextual level.

The present study is of significance for a number of theoretical and practical reasons. From a theoretical perspective, few studies in sport and exercise psychology have empirically tested the validity of HMIEM (Vallerand, 1997). This is important given the potential for this model to forward understanding of the mechanisms underlying motivation towards sport and physical activities. The proposed Motivational Model of Flow will also allow for a number of important yet unexplored relationships to be empirically tested, for example, the relationships between perceptions of the motivational climate and perceptions of autonomy and relatedness. In addition, the link between motivational consequences at one level of generality and motivation at another level of generality has been proposed for the first time in this study and will be examined. This unexplored link is particularly important given its potential to provide insight into physical activity behavior. Finally, by using a time-lagged design, the current investigation will also allow for an examination of the temporal relationship between different levels of motivation as well as the link between flow and contextual motivation. From a practical perspective, the current investigation has the potential to forward understanding with respect to what brings about self-determined motivation in addition to how flow states occur. Accordingly, athletes, coaches, teachers, and/or sport psychology consultants may be better able to promote self-determined motivation as well as facilitate the experience of this psychological state.

Method

Participants

Participants were 104 (59 males; 45 females) Canadian swimmers from eight master's

level swim clubs. They ranged in age from 18 to 64 years (M = 38.2 years) and had between 1 and 20 years experience with their respective clubs (M = 4.7 years). On average, participants swam 3.9 times per week with over half (n = 63) competing on a regular basis.

Design & Procedures

A two-wave, time-lagged design was used to test the proposed model. At Time 1 (T1), a situational questionnaire was administered to measure variables at the situational level in the model. At Time 2 (T2), one week later, variables at the contextual level were assessed using a contextual questionnaire.

Permission to conduct this investigation was initially obtained from club administrators. The situational and contextual questionnaires were then administered immediately following a swim practice. Participants were informed of the voluntary nature of their involvement and that anonymity and confidentiality would be maintained at all times. Swimmers responded to the questionnaires on the pool deck with each requiring approximately 15 minutes to complete.

Instruments

In the situational questionnaire, two situational distal determinants of motivation (perceptions of success and perceptions of the motivational climate), three situational proximal determinants of motivation (perceptions of autonomy, perceptions of competence, and perceptions of relatedness), situational motivation, and flow were assessed. The contextual questionnaire was used to assess these same variables but at the contextual level of generality. The only exception in this regard was the flow state, which was not assessed. Both instruments were composed of similar items taken from previously validated scales that were adapted to suit the swimming context. All items were assessed using a 7-point Likert type scale with 1

(strongly disagree) and 7 (strongly agree) representing extreme values.

Distal Motivational Determinants

Perceptions of the Motivational Climate. Perceptions of the motivational climate were measured using an adapted version of the Perceived Motivational Climate in Sport Questionnaire (PMCSQ - Walling et al., 1993). Three items were used to assess perceptions of a mastery motivational climate and perceptions of a performance motivational climate. At the situational level (T1) participants were asked to respond to the general statement: "During the practice I just finished...". Examples of items corresponding to this statement were "...each swimmer's improvement was important" (mastery climate) and "...swimmers tried to out-perform teammates" (performance climate). At the contextual level (T2) participants responded to the general statement: "In general, on my current swim team,...". An example of an item corresponding to a mastery climate was: "...trying hard is important," whereas an example of a response assessing a performance climate was: "...the coach favors some swimmers more than others." Internal consistency measures of the mastery motivational climate subscales yielded Cronbach alpha coefficients of .54 at T1 and .62 at T2. Standardized Cronbach alpha coefficients for the performance climate subscale at T1 and T2 were .72 and .89, respectively.

Perceptions of Success. Perceptions of success were measured using an adapted scale developed by Fortier (1994). An example of an item used to assess situational perceptions of success (T1) was: "I performed favorably in this swim practice," whereas a response measuring contextual perceptions of past success (T2) was: "In the past, I have often succeeded in swimming". A standardized Cronbach alpha coefficients of .79 was obtained for

both 3-item scales at T1 and T2.

Proximal Motivational Determinants

Perceptions of Autonomy. Three adapted items from the Autonomy Perceptions in Life Contexts Scale (Blais & Vallerand, 1992) were used to assess perceptions of autonomy at each hierarchical level. A re-coded item measuring situational perceptions of autonomy was: "I felt obligated to be at this swim practice." An example of a re-coded item measuring contextual perceived autonomy was: "I often feel I have to go to swim practice." The standardized Cronbach alpha coefficients for this scale were .51 at T1 and .79 at T2.

Perceptions of Competence. An adapted version of the Perceived Competence Scale (Harter, 1982) was used to assess perceptions of competence at T1 and T2. These three-item scales yielded standardized Cronbach alpha coefficients of .60 and .83, respectively. Examples of items were: "I felt competent during this swim practice" (situational perceptions of competence) and "I believe I have a natural talent for swimming" (contextual perceptions of competence).

Perceptions of Relatedness. A modified version of the Perceived Relatedness Scale (Richer & Vallerand, 1996) was used to assess perceived relatedness. Both scales corresponded to a general statement regarding swimmers' relationship with teammates. At T1, the statement was: "During this practice, in my relations with the members of my current swim team, I felt..." At T2, the statement was: "In general, in my relations with the members of my team, I feel..." The three items used to assess perceived relatedness at T1 and T2 were: "supported," "attached," and "united." These scales yielded standardized Cronbach alpha coefficients of .82 (T1) and .86 (T2).

Situational and Contextual Motivation

Situational Motivation. Situational motivation was assessed using an adapted version of the Situational Motivation Scale (Guay & Vallerand, 1995). This instrument is composed of four three-item subscales designed to measure intrinsic motivation (IM), self-determined extrinsic motivation (SDEM), non self-determined extrinsic motivation (NSDEM), and amotivation (AMO). Participants were asked to respond to the general question "Why did you participate in this swim practice?" Example of items from each subscale were: "Because I found this practice pleasurable" (intrinsic motivation); "Because I believed this practice was important" (self-determined extrinsic motivation); "Because I felt I was expected to swim" (non self-determined extrinsic motivation); and "I swam in this practice but am not sure it was worth the effort" (amotivation). Standardized Cronbach alpha coefficients for the subscales ranged between .66 and .85 ($\underline{M}$ = .74).

In order to arrive at a general measure of situational motivation, a self-determination index was computed using the following formula: [(2 x IM + SDEM) - (NSDEM + 2 x AMO)] (Guay & Vallerand, 1995; Vallerand & O'Connor, 1989). In the computation of the index, intrinsic motivation and amotivation were each assigned weights of +2 and -2, respectively, whereas, self-determined extrinsic motivation and non self-determined extrinsic motivation were assigned weights of +1 and -1, respectively, because of their position on the self-determination continuum (Deci & Ryan, 1985, 1991). The validity and salience of using this type of index has been demonstrated in a multitude of past studies (e.g., Brière et al., 1995; Fortier et al., 1995; Pelletier et al., 1995; Vallerand & Bissonnette, 1992; Vallerand et al., 1997).

Contextual Motivation. An adapted version of the Sport Motivation Scale (Pelletier et al., 1995) was used to assess contextual motivation. This instrument used here was composed of seven, 3-item subscales designed to assess three types of intrinsic motivation (intrinsic motivation to know, intrinsic motivation toward accomplishment, and intrinsic motivation to experience stimulation), three types of extrinsic motivation (identification, introjection, and external regulation), and amotivation. Participants responded to the question: "In general, why do you swim?" Examples of items assessing the seven types of motivation were: "For the pleasure it gives me to know more about swimming" (intrinsic motivation to know); "For the pleasure that I feel while executing certain difficult skills/techniques" (intrinsic motivation toward accomplishment); "For the excitement I feel when I am really involved in swimming" (intrinsic motivation to experience stimulation); "Because it is one of the best ways I have chosen to develop other aspects of myself" (identification); "Because I must do physical activity regularly" (introjection); "Because people around me think it is important to be in shape" (external regulation); and "I don't know anymore; I have the impression that I am incapable of succeeding in swimming" (amotivation). The seven subscales yielded standardized Cronbach alpha levels ranging between .69 and .89 (M = .77).

Similar to the situational self-determination index, a contextual self-determination index was computed in order to arrive at a general measure of contextual motivation. We computed the contextual index using the following formula: [(2 x (IM knowledge + IM accomplishment + IM stimulation)/3 + identification) - (external regulation + (2 x amotivation))]. Several studies have employed this type of self-determination index in various life domains including sport and physical activity (e.g., Pelletier, et al., 1995; Chantal, Guay, Dobreva-Martinova, &

Vallerand, 1996) and education (e.g., Fortier et al., 1995; Losier et al., 1996; Vallerand & Guay, 1996; Vallerand et al., 1997) and have shown that it has satisfactory levels of reliability and validity.

Flow

The Flow State Scale (FSS - Jackson & Marsh, 1996) was used to assess flow at T1. This instrument is composed of nine subscales, each of which corresponds to a different flow characteristic. The nine subscales on the FSS along with an example of an item included on each were: Challenge-Skill Balance ("I felt I was competent enough to meet the high demands of the situation"); Action-Awareness Merging ("I did things spontaneously without having to think"); Clear Goals ("I knew clearly what I wanted to do"); Unambiguous Feedback ("I had a good idea while I was performing about how well I was doing"); Concentration on Task on Hand ("My attention was focused entirely on what I was doing"); Sense of Control ("I had a feeling of total control"); Loss of Self-Consciousness ("I was not concerned with what others may have been thinking of me"); Transformation of Time ("It felt like time stopped while I was performing"); Autotelic Experience ("The experience left me feeling great"). Each subscales was assessed using three items. Standardized Cronbach alpha coefficients ranged between .76 and .89 ($\underline{M}$ = .84). A general measure of flow was also computed by combining the nine subscales. It yielded a standardized alpha coefficient of .92.

Results

Path Analysis

In order to test the Motivational Model of Flow, a recursive path analysis (Pedhazur, 1982) was conducted using the multiple regression technique (see Figure 2; see also the

Appendix for means, standard deviations, and correlations among the variables included in the model). The path analysis consisted of a series of nine multiple regressions. The first was conducted to predict contextual motivation by entering five predictor variables, namely, situational motivation, flow, contextual perceptions of autonomy, contextual perceptions of competence, and contextual perceptions of relatedness. Situational motivation ($\beta = .38$, $p = < .001$) and contextual perceived relatedness ($\beta = .29$, $p = < .01$) had a significant and direct influence on contextual motivation. Flow ($\beta = .01$, $p = .926$), contextual perceptions of autonomy ($\beta = .14$, $p = .106$), and contextual perceptions of competence ($\beta = .04$, $p = .683$) did not emerge as significant predictors of the criterion variable. A total of 37% of the variance in contextual motivation was explained by the five predictors.

Insert Figure 2 about here

In the second multiple regression, contextual perceptions of a mastery motivational climate and contextual perceptions of a performance motivational climate were used to predict contextual perceptions of autonomy. Six percent of the variance in the criterion variable was accounted for by these two variables. The path coefficient of contextual perceptions of a performance motivational climate onto perceived autonomy was negative and significant ($\beta = -.26$, $p < .05$), whereas the path coefficient of contextual perceptions of a mastery motivational climate onto the criterion variable was nonsignificant ($\beta = -.08$, $p = .423$).

The third multiple regression was to predict contextual perceptions of competence. We entered contextual perceptions of a mastery motivational climate, contextual perceptions of a performance motivational climate, and contextual perceptions of success as predictor variables.

Contextual perceptions of success (β = .62, p < .001) had a significant linkage with contextual perceptions of competence, whereas perceptions of a mastery climate (β = -.05, p = .512) and perceptions of a performance climate (β = -.05, p = .547) did not. This multiple regression accounted for 38% or the variance in the criterion variable.

The fourth multiple regression used contextual perceptions of a mastery motivational climate and contextual perceptions of a performance motivational climate to predict contextual perceptions of relatedness. Thirty-two percent of the variance in the criterion variable was accounted for by these two variables. Contextual perceptions of a mastery motivational climate had a significant and direct influence on contextual perceived relatedness (β = .52, p < .001), however, contextual perceptions of a performance motivational climate had a negative but nonsignificant influence on contextual perceptions of relatedness (β = -.15, p = .067).

In the fifth regression analysis, situational self-determined motivation was used to predict flow. The path coefficient of situational motivation onto the flow state was .44 (p < .001). Nineteen percent of the variance in flow was accounted for by this variable.

In the sixth multiple regression, situational measures of perceived autonomy, perceived competence, and perceived relatedness were entered as predictors of situational self-determined motivation. These three variables accounted for 37% of the variance in situational self-determined motivation and yielded statistically significant path coefficients of .18 (p < .05), .39 (p < .01), and .28 (p < .01), respectively.

The seventh, eighth, and ninth multiple regression were very similar to the second, third, and fourth multiple regressions, respectively. However, the seventh, eighth, and ninth regressions were conducted with variables at the contextual level in the model. That is, the

seventh multiple regression attempted to predict situational perceptions of autonomy, the eighth multiple regression was used to predict situational perceptions of competence, and the ninth multiple regression attempted to predict situational perceptions of relatedness. Results indicated that situational perceptions of a mastery motivational climate and situational perceptions of success were significant predictor of situational perceptions of relatedness (β = .30, $p < .01$) and situational perceptions of competence (β = .56, $p < .001$), respectively. No significant path coefficients were found for the regression of situational measures of perceptions of a mastery motivational climate onto perceived autonomy (β = -.06, p = .575) or perceptions of competence (β = .01, p = .948), or the regression of situational perceptions of a performance motivational climate onto situational perceived autonomy (β = -.07, p = .468), situational perceived competence (β = -.04, p = .657), or situational perceived relatedness (β = -.05, p = .597). A total of 1% of the variance in situational perceptions of autonomy, 33% of the variance in situational perceptions of competence, and 10% of the variance in situational perceptions of relatedness was explained by these analyses.

In line with a theory-trimming procedure (see Pedhazur, 1982), the path analysis was repeated using only the significant predictor variables (Figure 3). This resulted in changes in several path coefficients as well as changes in the percent of variance explained in a number of the criterion variables.

Insert Figure 3 about here

Discussion

The purpose of the present study was to propose and test a Motivational Model of

Flow. This model was based predominantly on Vallerand's (1997) HMIEM but also integrated past research on motivation (Blanchard & Vallerand, 1996a, 1996b; Seifriz et al., 1992) and flow (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 1993; Jackson, 1995; Jackson & Roberts, 1992; Stein et al., 1995). It was hypothesized that the model would be found valid, that is, the predicted relationships would be significant and in the expected direction. Results revealed that many links in the model were indeed obtained. In terms of the distal motivational determinants, as predicted, perceptions of success were positively related to perceptions of competence at both the situational and contextual levels indicating that individuals whose past experiences were perceived as successful also perceived themselves as competent. These findings concur with the theoretical link postulated by Bandura (1986) as well as the results of past studies in which contextual measures of perceived success and perceived self-efficacy/competence have been positively linked (Brody et al. 1988; Feltz, 1988; Feltz & Mugno, 1983; Vlachopoulos et al., 1996). Since, to our knowledge, no study has examined this relationship on a situation-specific basis, results of the current investigation provide initial support for its salience at a situational level.

With regards to perceptions of the motivational climate, results partially supported predictions. As expected, perceptions of a mastery motivational climate was positively linked with perceptions of relatedness at both the contextual and situational levels. While this relationship was examined for the first time in the present study, findings suggest that physical activity contexts in which an emphasis is placed on mastering tasks, learning, and/or improving one's ability may enhance participants' general and state feelings of connectedness with others. However, contrary to expectations, perceptions of a mastery motivational climate

were not significantly related to perceived competence or perceived autonomy at either hierarchical level. While no study to date has examined the link between a perceived mastery climate and perceived autonomy, these findings contradict results of past studies in which contextual measures of perceived mastery climate have been positively linked with perceived competence (Kavussanu & Roberts, 1996; Ames, 1992; Ames & Archer, 1988). It may be that a motivational climate characterized by learning and mastering skills does not have as salient an influence on athletes' perceptions of competence in the master's swimming context as compared to other contexts.

With respect to perceptions of a performance motivational climate, results demonstrated that contextual measures of a perceived performance motivational climate and perceived autonomy were negatively linked. This indicates that physical activity settings in which the emphasis is on competition or out-performing others may undermine athletes' perceptions autonomy. Although this particular relationship was found at the contextual level, it was not supported at the situational level suggesting that the link between these variables may be subject to variation across situations. The nonsignificant links between perceptions of a performance motivational climate and the two other proximal determinants at both hierarchical levels demonstrates that this type of social environments may have little influence on perceived competence or perceived relatedness. Again, this may be due to the nature of the master's swimming context. It may also be that, in general, since perceptions of a motivational climate are based on a conception of goals, whereas perceived autonomy, competence, and relatedness are based on a conception of needs, these constructs may be fundamentally different. It would also seem possible that the motivational climate is directly related to motivation and is not

mediated by the three proximal determinants as predicted by SDT (Deci & Ryan, 1985, 1991). Future research may therefore do well to further explore these possibilities.

In terms of the relationships between the three proximal determinants and self-determined motivation, results partially supported predictions. At the situational level, positive links between perceived autonomy, perceived competence, and perceived relatedness and self-determined motivation were found. These findings are in line with expectations and support the theoretical proposition that the three fundamental needs for autonomy, competence, and relatedness have a direct and positive influence on self-determined motivation (Deci & Ryan, 1985, 1991; Vallerand, 1997). These findings also support the results of past studies conducted at a situation-specific level (Blanchard & Vallerand, 1996a, 1996b; Reeve & Deci, 1996; Vallerand & Reid, 1984, 1988) in which these three proximal motivational determinants have been shown to directly affect self-determined motivation.

Results linking contextual measures of perceived autonomy, competence, and relatedness with self-determined motivation were in partial accordance with hypotheses. As anticipated, perceived relatedness emerged as a salient predictor of self-determined motivation. This finding is in line with SDT/HMIEM and supports the postulate that the more individuals perceive themselves as being connected with others, the more their motivation will be self-determined. This finding also concurs with results obtained in physical activity settings (Blanchard & Vallerand, 1996a, 1996b) and in other contexts (Guay & Vallerand, 1996; Richer & Vallerand, 1996).

The nonsignificant relationships between perceived autonomy and perceived competence and self-determined motivation ran contrary to expectations. It was found that

perceptions of autonomy and perceptions of competence did not predict self-determined motivation towards swimming. These results are in discord with SDT/HMIEM as well as past research in this area (Brustad, 1988; Fortier, et al., 1995; Frederick & Ryan, 1991; Guay & Vallerand, 1996; Losier et al.,1996; Vallerand & Guay, 1996; Vallerand et al., 1997). It may be that in the context of master's swimming, feelings of autonomy or competence may not have been overly important given that many of the swimmers either did not compete or competed on a limited basis. It is also possible that certain needs may be more salient in certain contexts than others. For example, the need for competence may be more important in competitive settings than in less competitive environments such as master's swimming. Similarly, the need for relatedness may be less salient in competitive contexts than in less competitive situations. Future research may address these issues.

With respect to the different levels of motivation, a positive and significant relationship was obtained between situational motivation and contextual motivation indicating that the more swimmers' motivation towards a specific practice was self-determined (i.e., at the situational level), the more it was subsequently self-determined towards this activity in general (i.e., at the contextual level). This finding is congruent with predictions and supports the theoretical postulates underlying the HMIEM (Vallerand, 1997) in which situational self-determined motivation is posited to have a positive affect on contextual self-determined motivation. It also supports the results of a study conducted by Blanchard et al. (1995). This particular finding is noteworthy because it provides additional support for an important yet relatively unexplored relationship between the different levels of motivation. However, it should be mentioned that we did not assess the manner in which contextual motivation impacts situational motivation.

Just as situational motivation positively influences contextual motivation, motivation at a contextual level is predicted to positively impact motivation at a situational level. Future studies may endeavor to explore this relationship.

From the vantage point of flow, as expected, situational motivation had a positive impact on the experience of this psychological state. Specifically, it was found that situational self-determined motivation predicted flow. This finding would seem to suggest that swimmers' reasons for engaging in a specific practice may facilitate their experience of flow. It is also congruent with the theoretical relationship between motivation and flow in which self-determined motivation is posited to act as a precursor to flow (Deci & Ryan, 1985) and supports the results of past studies in which a positive link between these variables was found (Csikszentmihalyi & LeFevre, 1989; Graef et al., 1983; Haworth & Hill, 1992; Iso-Ahola, 1979; Jackson & Roberts, 1992; Kowal & Fortier, in press). However, this finding contradicts the results of Stein et al. (1995) who did not find situational goal-orientations to be a significant predictor of flow. In the present study, results clearly suggest that self-determined motivation may indeed positively impact the experience of this psychological state.

When examined in terms of SDT/HMIEM (Vallerand, 1997), the positive link between self-determined motivation at one level of generality and motivational consequences (flow) at the same hierarchical level was supported. This finding provides evidence to support the salience and validity of Vallerand's theoretical model. It is important to underscore that in the present study, this relationship was tested at the situational level only and was not examined at the contextual level.

The relationship between flow and contextual motivation partially supported

predictions. Results showed that the experience of this psychological state did not positively influence swimmer's general motivation towards their sport. Findings thus disagree with the results of Csikszentmihalyi et al. (1993) who showed that flow had a positive influence on students' motivation to seek out challenging activities. However, it is important to underscore that, in the current investigation, while flow failed to predict contextual motivation in the current investigation, a positive and significant relationship between these variables was indeed obtained (see Appendix). These mixed findings may be due to the limited number of participants who took part in this study as well as the manner in which the path analysis was conducted which resulted in the nonsignificant beta weight. This may also be attributable to the fact that the relationship between these variables was assessed on a single occasion and was not examined on a longitudinal basis. Future studies would therefore seem needed in order to further explore this link.

In terms of the HMIEM, the hypothesized link between motivational consequences at one level of generality and self-determined motivation at another level of generality was not originally proposed by Vallerand (1997). To our knowledge, this relationship has never previously been explored. In the current study, it was initially examined by assessing the impact of flow onto contextual motivation and although this relationship was not supported, it serves to extend the HMIEM by adding another important relationship to this theoretical framework. Future studies may do well to explore the link between motivational outcomes at one hierarchical level and self-determined motivation at another level of generality.

When interpreting the results of this study, it is important to consider a number of limitations. As mentioned previously, one limitation pertains to sample size and in particular,

the limited number of participants involved. With a larger sample, it is possible that certain results would have emerged somewhat differently. A corollary to this limitation pertains to the nature of analysis conducted. In the present study, path analysis was used to test the proposed model instead of a more rigorous method such as structural equation modeling (SEM). While SEM would certainly be considered the method of choice, it was not used due to the restricted sample size. Future research may benefit from involving a greater number of participants and subsequently using SEM.

Another limitation concerns the nature of the research design. By examining situational variables at T1 and contextual variables at T2, we examined the influence of situational measures onto contextual measures. What was not ascertained was the impact of contextual variables onto situational variables. Examining the impact of contextual motivation onto situational motivation and/or the experience of flow may thus be a fruitful avenue for future research.

A final limitation pertains to the manner in which variables were assessed at each hierarchical level. Since all variables at T1 and T2 were measured at a single point in time, causal inferences with respect to relationships between variables cannot be substantiated. Although several links were measured on a time-lagged basis and may provide insight into the direction of the relationships, for example, the link between situational and contextual self-determined motivation, such interpretations should be made with caution. Using experimental or longitudinal designs may prove useful in this regard.

Conclusion & Practical Applications

In summary, the present study has allowed for a number of important relationships to

be examined within the theoretical framework of the Motivational Model of Flow. This model has tested that validity of the HMIEM (Vallerand, 1997), has extended the HMIEM by adding a new theoretical relationship between situational motivational consequences and contextual motivation, and has served as a salient basis for assessing several previously unexplored links. From an applied perspective, results of the present study may be used by practitioners in order to promote self-determined motivation and/or facilitate the experience of flow.

References

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), Motivation in sport and exercise (pp. 161-176). Champaign, IL: Human Kinetics.

Ames, C. & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. Journal of Educational Psychology, 80, 260-267.

Bandura, A. (1986). Social foundations of thought and action: A social-cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Blais, M. R., & Vallerand, R. J. (1992). Développement et validation de l'échelle des perceptions d'autonomie dans les domains de vie [Development and validation of the autonomy perception in life contexts scale]. Unpublished manuscript, Université du Québec à Montréal.

Blanchard, C., & Vallerand, R. J. (1996a). On the social and intrapersonal determinants of situational motivation. Manuscript in preparation, Université du Québec à Montréal.

Blanchard, C., & Vallerand, R. J. (1996b). Perceptions of competence, autonomy, and relatedness as psychological mediators of the social factors-contextual motivation relationship. Manuscript in preparation, Université du Québec à Montréal.

Blanchard, C., Vallerand, R. J., & Provencher, P. (1995, October). Une analyse des effets bidirectionnels entre la motivation contextuelle et la motivation situationnelle en milieu

naturel [An analysis of the bidirectional effects between contextual and situational motivation in a natural setting]. Paper presented at the annual conference of the Québec Society for Research on Psychology, Ottawa.

Brière, N. M., Vallerand, R. J., Blais, M. R., & Pelletier, L. G. (1995). Développement et validation d'une mesure de motivation intrinsèque, extrinsèque et d'amotivation en context sportif: l'Échelle de motivation dans les sports (EMS). [On the development and validation of the French form of the sport motivation scale]. International Journal of Sport Psychology, 26, 465-489.

Brody, E. B., Hatfield, B. D., & Spalding, T. W. (1988). Generalization of self-efficacy to a continuum of stressors upon mastery of a high-risk sport skill. Journal of Sport and Exercise Psychology, 10, 32-44.

Brustad, R. J. (1988). Affective outcomes in competitive youth sport: The influence of intrapersonal and socialization factors. Journal of Sport and Exercise Psychology, 10, 307-321.

Chantal, Y., Guay, F., Dobreva-Martinova, & Vallerand, R. J. (1996). Motivation and elite performance: An exploratory investigation with Bulgarian athletes. International Journal of Sport Psychology, 27, 173-182.

Chantal, Y., Guay, F., & Vallerand, R. J. (1996). Structural analysis of the motivational consequences: A test of the specificity hypothesis. Manuscript in preparation, Université du Québec à Montréal.

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. New York: HarperPerennial.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. Journal of Personality and Social Psychology, 56, 815-822.

Csikszentmihalyi, M., & Nakamura, J. (1989). The dynamics of intrinsic motivation: The study of adolescents. In C. Ames, & R. Ames (Eds.) Research on motivation in education (Vol. 3, pp. 45-71). San Diego, CA: Academic Press.

Csikszentmihalyi, M., & Rathunde, (1993). The measurement of flow in everyday life: Toward a theory of emergent motivation. In J. E. Jacobs (Ed.), Nebraska symposium on motivation, 1992: Developmental perspectives on motivation. Current theory in research in motivation, Vol. 40 (pp. 57-97). Lincoln, NE: University of Nebraska Press.

Csikszentmihalyi, M., Rathunde, K., & Whelan, S. (1993). Talented teenagers: The roots of success and failure. New York: Cambridge University Press.

deCharms, R. (1968). Personal causation: The internal affective determinants of behavior. New York: Academic Press.

Deci, E. L. (1975). Intrinsic motivation. New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum Press.

Deci. E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), Nebraska symposium on motivation: Vol. 38. Perspectives on motivation (pp. 237-288). Lincoln, NE: University of Nebraska Press.

Feltz, D. L. (1988). Gender differences in the causal elements of self-efficacy on a high avoidance motor task. Journal of Sport and Exercise Psychology, 10, 151-166.

Feltz, D. L., & Mugno, D. A. (1983). A replication of the path analysis of the causal

elements in Bandura's theory of self-efficacy and the influence of autonomic perception. Journal of Sport Psychology, 5, 263-277.

Fortier, M. S. (1994). Une analyse motivationnelle de la poursuite d'études en sciences [A motivational analysis of science persistence]. Unpublished doctoral dissertation, Université du Québec à Montréal, Montréal, Québec, Canada.

Fortier, M. S., & Grenier, M. (in press). Les déterminants personnels et situationnels de l'adhérence à l'exercise: Une étude prospective [Situational and personal determinants of exercise adherence: A prospective study]. Revue STAPS.

Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic motivation and school performance: Toward a structural model. Contemporary Educational Psychology, 20, 257-274.

Frederick, C. M., Manning, T., & Morrison, C. (1996). Motivation to participate, exercise affect, and outcome behaviors toward physical activity. Perceptual and Motor Skills, 82, 691-701.

Frederick, C. M., & Ryan, R. M. (1991). Differences in motivation for sport and exercise and their relation with participation and mental health. Journal of Sport Behavior, 16, 124-145.

Frederick, C. M., & Ryan, R. M. (1995). Self-determination in sport: A review using cognitive evaluation theory. International Journal of Sport Psychology, 26, 5-23.

Graef, R. M., Csikszentmihalyi, M., & McManama-Gianinno, S. (1983). Measuring intrinsic motivation in everyday life. Leisure Studies, 2, 155-168.

Guay, F., & Vallerand, R. J. (1995, June). The situational motivation scale. Paper

presented at the annual convention of the American Psychological Society, New York.

Guay, F., & Vallerand, R. J. (1996). Social context, students' motivation, and academic achievement: Toward a process model. Manuscript submitted for publication.

Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. Human Development, 21, 34-64.

Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.

Haworth, J. T., & Hill, S. (1992). Work, leisure, and psychological well-being in a sample of young adults. Journal of Community and Applied Psychology, 2, 147-160.

Iso-Ahola, S. E. (1979). Basic Dimensions of Definitions of Leisure. Journal of Leisure Research, 11, 28-39.

Jackson, S. A. (1992). Athletes in flow: A qualitative investigation of flow states in elite figure skaters. Journal of Applied Sport Psychology, 4, 161-180.

Jackson, S. A. (1995). Factors influencing the occurrence of flow state in elite athletes. Journal of Applied Sport Psychology, 7, 138-166.

Jackson, S. A., & Marsh, H. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. Journal of Sport and Exercise Psychology, 18, 17-35.

Jackson, S. A., & Roberts, G. C. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. The Sport Psychologist, 6, 156-171.

Kavussanu, M. & Roberts, G. C. (1996). Motivation in physical activity contexts: The relationship of perceived motivational climate to intrinsic motivation and self-efficacy. Journal

of Sport and Exercise Psychology, 18, 264-280.

Kowal, J., & Fortier, M. S. (in press). Motivational determinants of flow: Contributions from self-determination theory. Journal of Social Psychology.

Lepper, M. R., & Greene, D. (Eds.). (1978). The hidden costs of reward. Hillsdale, NJ: Erlbaum.

Losier, G. F., Vallerand, R. J., Provencher, P., Fortier, M. S., Senécal, C. B., & Rinfret, N. (1996). Persistence in graduate school: A motivational analysis. Manuscript in preparation.

Massimini, F., Csikszentmihalyi, M., & Delle Fave, A. (1988). Flow and biocultural evolution. In M. Csikszentmihalyi, & I. S. Csikszentmihalyi (Eds.), Optimal experience: Psychological studies of flow in consciousness (pp. 60-81). New York: Cambridge University Press.

Pedhazur, E. J. (1982). Multiple regression in behavioral research. New York: Holt, Rinehart, and Winston.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Brière, N. M. (1997). Perceived autonomy support, levels of self-determination, and persistence: A longitudinal study. Manuscript submitted for publication.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., Brière, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). Journal of Sport and Exercise Psychology, 17, 35-53.

Reeve. J., & Deci, E. L. (1996). Elements of the competitive situation that affect

intrinsic motivation. Personality and Social Psychology Bulletin, 22, 24-33.

Richer, S., & Vallerand, R. J. (1996). Construction et validation de l'échelle du sentiment d'appartenance social (ÉSAS) [Construction and validation of the Perceived Relatedness Scale]. Manuscript submitted for publication.

Roberts, G. C. (1992). Motivation in sport and exercise: Conceptual constraints and convergence. In G. C. Roberts (Ed.), Motivation in sport and exercise (pp. 3-29). Champaign, IL: Human Kinetics.

Ryan, R. M., Connell, J. P., & Grolnick, W. S. (1990). When achievement is not intrinsically motivated: A theory of self-regulation in school. In A. K. Boggiano & T. S. Wittman (Eds.), Achievement and motivation: A social-developmental perspective (pp. 167-188). New York: Cambridge University Press.

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. Journal of Sport and Exercise Psychology, 14, 375-391.

Stein, G. L., Kimiecik, J. C., Daniels, J., & Jackson, S. A. (1995). Psychological antecedents of flow in recreational sport. Personality and Social Psychology Bulletin, 21, 125-135.

Thompson, C. E., & Wankel, L. M. (1980). The effect of perceived ability choice upon frequency of exercise behavior. Journal of Applied Social Psychology, 10, 436-443.

Vallerand, R. J., (1993). La motivation intrinsèque et extrinsèque en milieu naturel: Implications pour les secteurs de l'éducation, du travail, des relations interpersonelles et des loisirs [Intrinsic and extrinsic motivation in the natural contexts: Implications for the

education, work, interpersonal relationships, and leisure contexts]. In R. J. Vallerand & E. Thill (Eds.), Introduction à la psychologie de la motivation [Introduction to the psychology of motivation] (pp. 533-581). Montréal: Études Vivantes.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), Advances in experimental social psychology (Vol. 29, pp. 271-360). New York: Academic Press.

Vallerand, R. J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. Journal of Personality, 60, 599-620.

Vallerand, R. J., Blais, M. R., Brière, N. M., & Pelletier, L. G. (1989). Construction et validation de l'Échelle de motivation en éducation (EME) [On the construction and validation of the French form of the academic motivation scale]. Canadian Journal of Behavioural Science, 21, 323-349.

Vallerand, R. J., Deci, E. L., & Ryan, R. M. (1987). Intrinsic motivation in sport. Exercise and Sport Sciences Review, 15, 389-425.

Vallerand, R. J., Fortier, M. S., & Guay. F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. Journal of Personality and Social Psychology, 72, 1161-1176.

Vallerand, R. J., & Guay, F. (1996). A confirmatory test of the hierarchical motivational model of intrinsic and extrinsic motivation. Manuscript in preparation, Université du Québec à Montréal.

Vallerand, R. J., & Losier, G. F. (1994). Self-determined motivation and sportsmanship orientations: An assessment of their temporal relationship. Journal of Sport and

Exercise Psychology, 16, 229-245.

Vallerand, R. J., & O'Connor, B. P. (1989). Motivation in the elderly: A theoretical framework and some promising findings. Canadian Psychology, 30, 538-550.

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. Educational and Psychological Measurement, 52, 1003-1019.

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1993). On the assessment of intrinsic, extrinsic, and amotivation in education: Evidence on the concurrent and construct validity of the Academic Motivation Scale. Educational and Psychological Measurement, 53, 159-172.

Vallerand, R. J., & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of cognitive evaluation theory. Journal of Sport Psychology, 6, 94-102.

Vallerand, R. J., & Reid, G. (1988). On the relative effects of positive and negative verbal feedback on males' and females' intrinsic motivation. Canadian Journal of Behavioural Sciences, 20, 239-250.

Vlachopoulos, S., Biddle, S., & Fox, K. (1996). A social cognitive investigation into the mechanism of affect generation in children's physical activity. Journal of Sport and Exercise Psychology, 18, 174-193.

Walling, M. D., Duda, J. L. & Chi, L. (1993). The perceived motivational climate in sport questionnaire: Construct and predictive validity. Journal of Sport and Exercise Psychology, 15, 172-183.

Wankel, L. M., & Sefton, J. M. (1989). A season-long investigation of fun in youth sports. Journal of Sport and Exercise Psychology, 11, 355-366.

Appendix

Means, Standard Deviations, and Pearson Correlations of the Situational and Contextual Variables in the Motivational Model of Flow

Variable	M	SD	1	2
1. Situational Perceptions of a Mastery Motivational Climate	5.63	.74	--	
2. Situational Perceptions of a Performance Motivational Climate	2.45	1.02	-.11	--
3. Situational Perceptions of Past Success	5.35	1.01	.40**	-.09
4. Situational Perceptions of Autonomy	4.85	1.24	-.05	-.07
5. Situational Perceptions of Competence	5.29	.85	.24*	-.09
6. Situational Perceptions of Relatedness	5.36	.91	.31**	-.08
7. Situational Self-Determined Motivation	11.42	3.38	.32**	-.22*
8. Flow	4.80	.74	.29**	.01
9. Contextual Perceptions of a Mastery Motivational Climate	5.78	.66	.29**	-.13
10. Contextual Perceptions of a Performance Motivational Climate	2.62	.98	-.20*	.68**
11. Contextual Perceptions of Past Success	5.22	1.14	.01	-.04
12. Contextual Perceptions of Autonomy	4.65	1.41	-.02	-.18
13. Contextual Perceptions of Competence	4.89	1.16	-.11	-.07
14. Contextual Perceptions of Relatedness	5.47	.82	.22*	-.10
15. Contextual Self-Determined Motivation	9.12	3.09	.17	-.15

*$p < .05$. **$p < .01$. $n = 104$

(table continues)

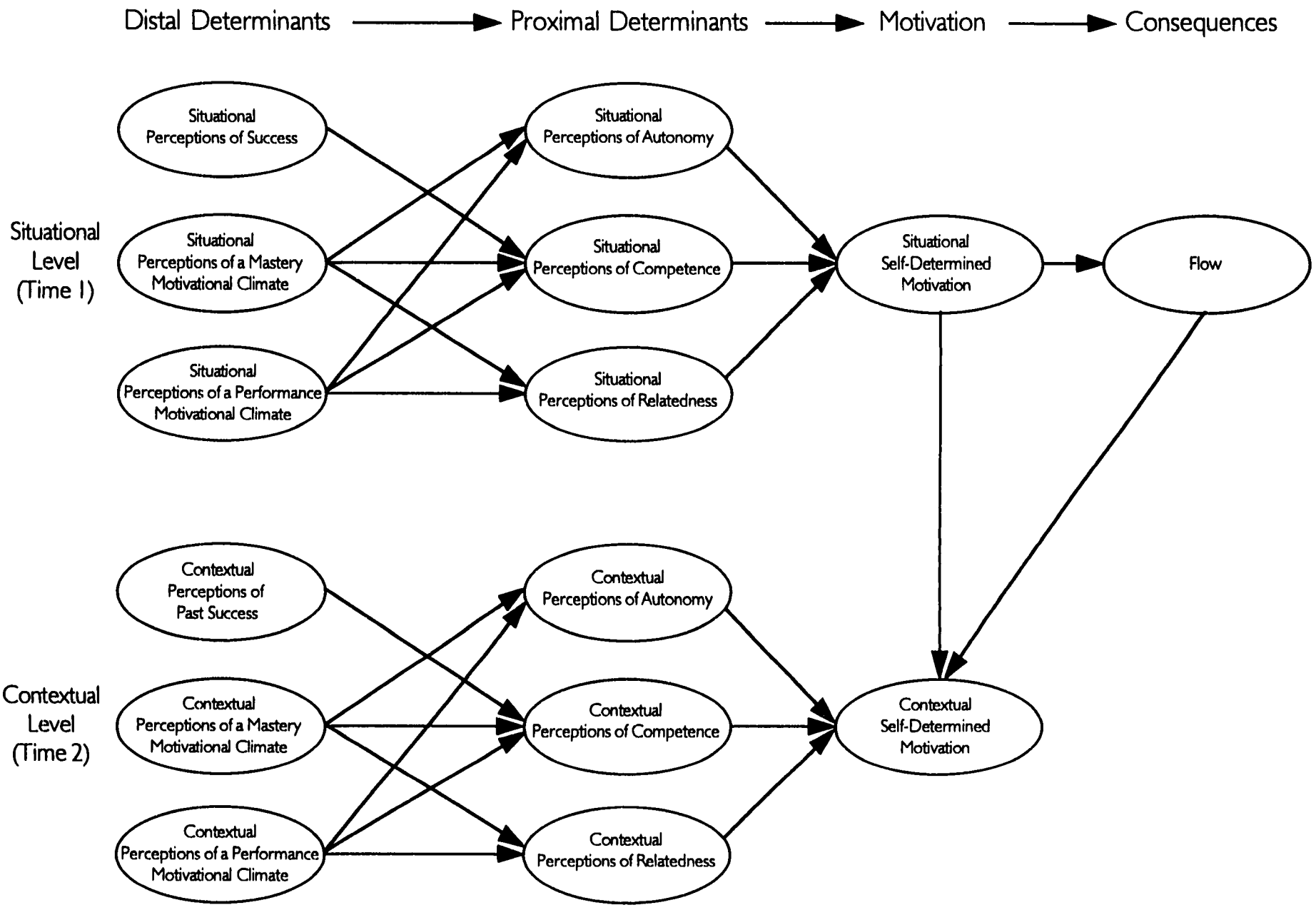
3	4	5	6	7	8	9	10	11	12	13	14	15
--												
-.09	--											
.57**	.25**	--										
.32**	-.03	.35**	--									
.46**	.27**	.54**	.41**	--								
.40**	.08	.46**	.47**	.44**	--							
.22*	-.02	.18	.49**	.19	.35**	--						
-.13	-.16	-.15	-.24*	-.29**	-.06	-.20*	--					
.11	.09	.23*	.21*	.18	.18	.27**	-.15	--				
-.01	.52**	.05	-.01	.31**	-.05	-.03	-.24*	-.02	--			
.18	.06	.38**	.26**	.28**	.39**	.12	-.13	.61**	-.14	--		
.33**	-.04	.30**	.71**	.31**	.44**	.55**	-.26**	.26**	-.01	.27**	--	
.17	.21*	.23*	.36**	.53**	.31**	.39**	-.27**	.26**	.26**	.20*	.42**	--

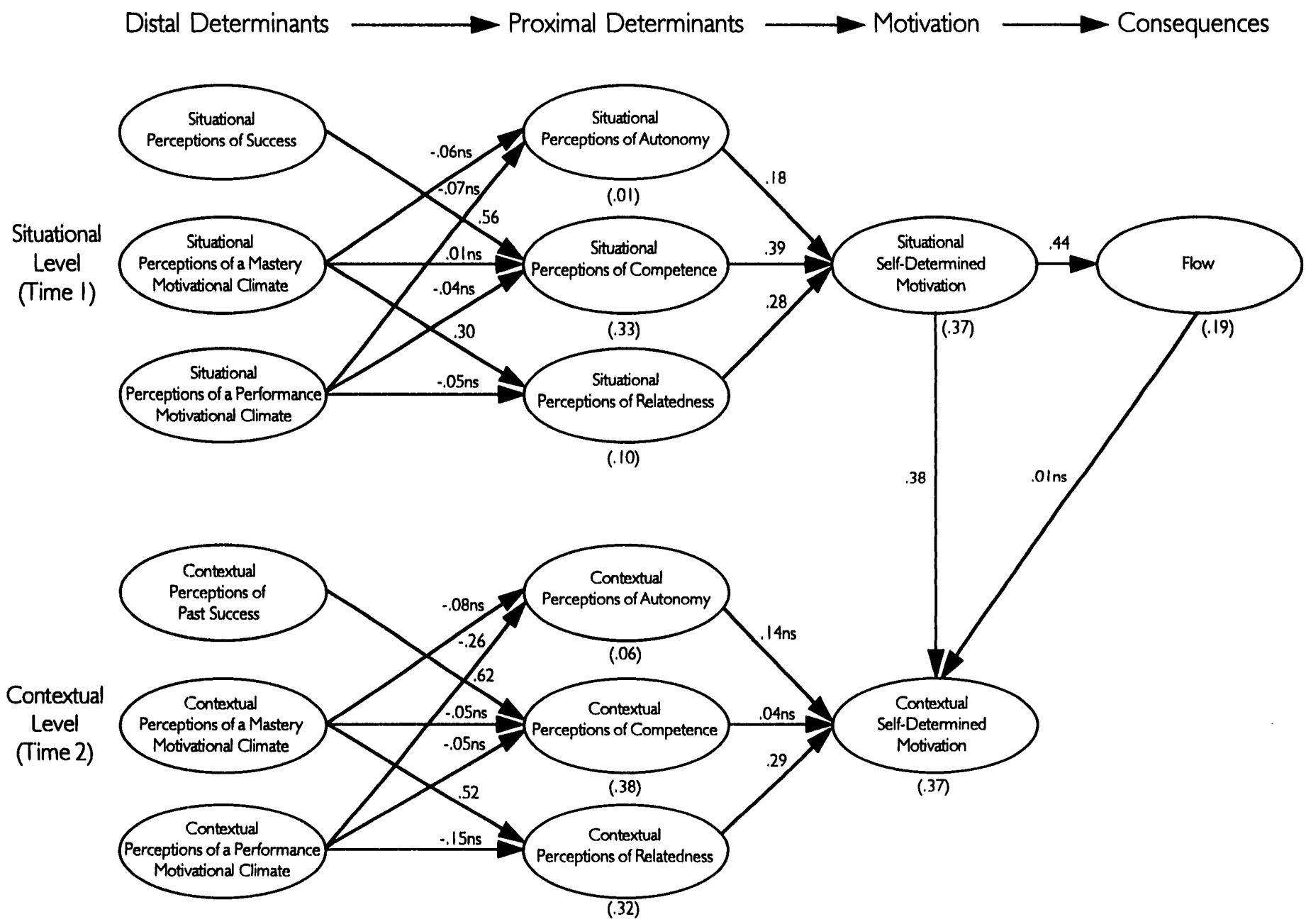
Figure Captions

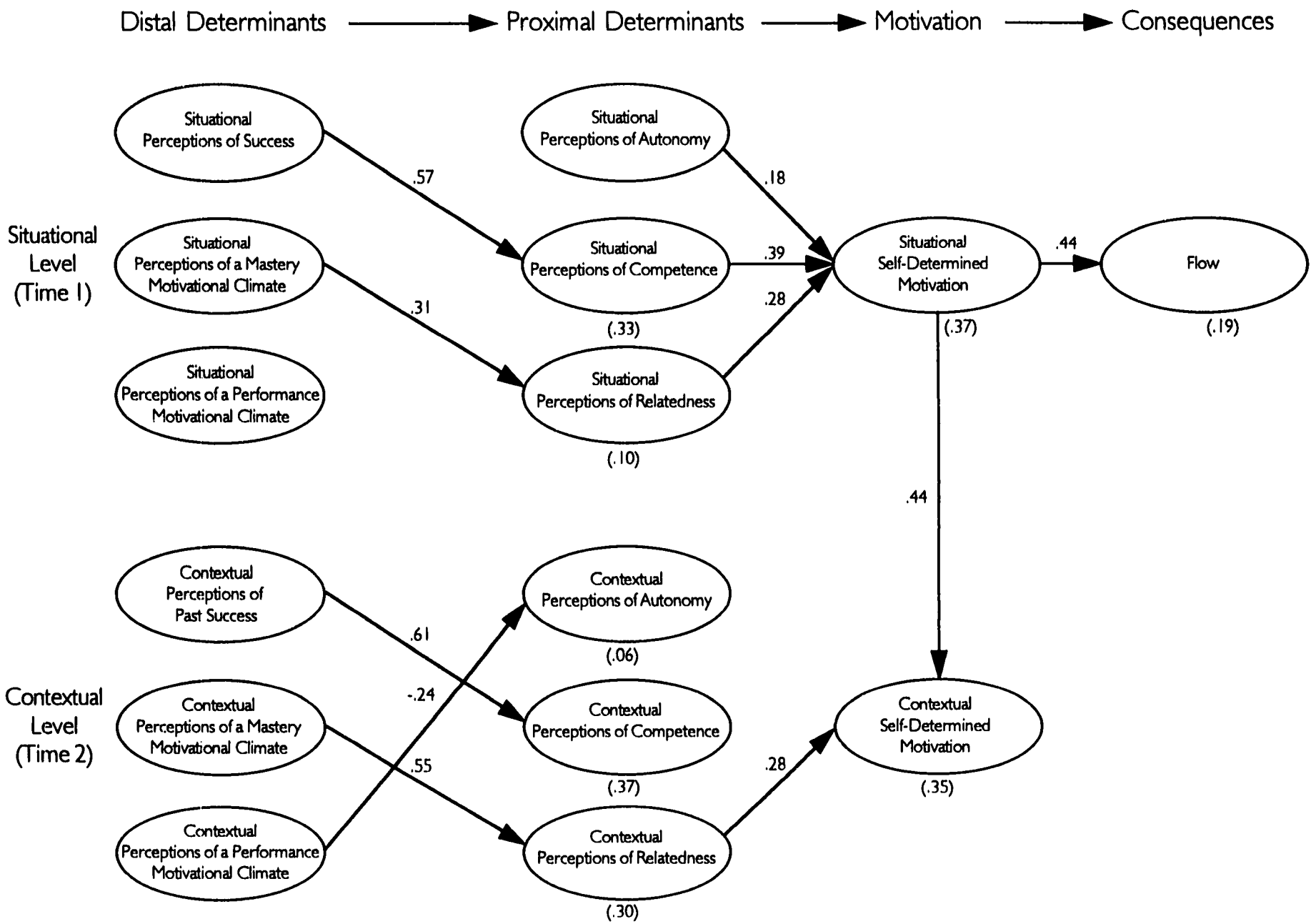
Figure 1. The Motivational Model of Flow.

Figure 2. Path diagram of the Motivational Model of Flow.

Figure 3. Trimmed path diagram of the Motivational Model of Flow.


Distal Determinants
Proximal Determinants
Motivation
Consequences
Situational Level (Time 1)
Situational Perceptions of Success
Situational Perceptions of a Mastery Motivational Climate
Situational Perceptions of a Performance Motivational Climate
Situational Perceptions of Autonomy
Situational Perceptions of Competence
Situational Perceptions of Relatedness
Situational Self-Determined Motivation
Flow
Contextual Level (Time 2)
Contextual Perceptions of Past Success
Contextual Perceptions of a Mastery Motivational Climate
Contextual Perceptions of a Performance Motivational Climate
Contextual Perceptions of Autonomy
Contextual Perceptions of Competence
Contextual Perceptions of Relatedness
Contextual Self-Determined Motivation


Distal Determinants
Proximal Determinants
Motivation
Consequences
Situational Level (Time 1)
Contextual Level (Time 2)
Situational Perceptions of Success
Situational Perceptions of a Mastery Motivational Climate
Situational Perceptions of a Performance Motivational Climate
Situational Perceptions of Autonomy
Situational Perceptions of Competence
Situational Perceptions of Relatedness
Situational Self-Determined Motivation
Flow
Contextual Perceptions of Past Success
Contextual Perceptions of a Mastery Motivational Climate
Contextual Perceptions of a Performance Motivational Climate
Contextual Perceptions of Autonomy
Contextual Perceptions of Competence
Contextual Perceptions of Relatedness
Contextual Self-Determined Motivation
-.06ns
-.07ns
.56
.01ns
-.04ns
.30
-.05ns
(.01)
(.33)
(.10)
.18
.39
.28
.44
(.37)
(.19)
.38
.01ns
-.08ns
-.26
.62
-.05ns
-.05ns
.52
-.15ns
(.06)
(.38)
(.32)
.14ns
.04ns
.29
(.37)


Distal Determinants
Proximal Determinants
Motivation
Consequences
Situational Level (Time 1)
Contextual Level (Time 2)
Situational Perceptions of Success
Situational Perceptions of a Mastery Motivational Climate
Situational Perceptions of a Performance Motivational Climate
Situational Perceptions of Autonomy
Situational Perceptions of Competence
Situational Perceptions of Relatedness
Situational Self-Determined Motivation
Flow
Contextual Perceptions of Past Success
Contextual Perceptions of a Mastery Motivational Climate
Contextual Perceptions of a Performance Motivational Climate
Contextual Perceptions of Autonomy
Contextual Perceptions of Competence
Contextual Perceptions of Relatedness
Contextual Self-Determined Motivation
.57
.31
.18
.39
.28
.44
.44
.61
-.24
.55
.28
(.33)
(.10)
(.37)
(.19)
(.06)
(.37)
(.30)
(.35)

CHAPTER IV

GENERAL DISCUSSION

In this chapter, a general discussion of the two journal articles is presented. The manner in which these articles are related is detailed, a number of issues pertaining to motivation and flow are highlighted, future research directions are proposed, and practical implications are addressed.

The general purpose of this thesis was to examine the relationship between motivation and flow. To this end, a single study was conducted in the context of master's level swimming using a two-wave, time-lagged design. At Time 1, situational measures of distal motivational determinants (perceptions of success and perceptions of the motivational climate), proximal motivational determinants (perceptions of autonomy, perceptions of competence, and perceptions of relatedness), self-determined motivation, and flow were assessed immediately following a swim practice. At Time 2 (one week later), contextual measures of these same variables were assessed with the exception of flow. Two sets of analyses were then conducted. In the first set of analyses (see Article 1, *Motivational Determinants of Flow: Contribution from Self-Determination Theory*), the relationship between different forms of situational motivation, situational motivational determinants, and flow was examined using analyses of variance and correlations (n = 203). In the second set of analyses (see Article 2, *Towards a Motivational Model of Flow: Testing Relationships from the Hierarchical Model of Intrinsic and Extrinsic Motivation*), a more complex Motivational Model of Flow was tested by way of a path analysis (n = 104). Situational and

contextual measures of distal motivational determinants, proximal motivational determinants, and self-determined motivation as well as the situational measure of flow were incorporated into this model.

A number of important issues pertaining to motivation and flow were highlighted in the two journal articles. These issues can be examined in terms of theoretical implications concerning motivational determinants, the relationship between situational self-determined motivation and flow, the influence of situational self-determined motivation on contextual self-determined motivation, the influence of flow on contextual self-determined motivation, and the characteristics of the flow state. Each of these issues is discussed in the following sections.

Theoretical Implications Concerning Motivational Determinants

With respect to motivational determinants, generally speaking, the predicted relationships between distal motivational determinants, proximal motivational determinants, and self-determined motivation were supported. Results of Article 2 showed that at each hierarchical level (contextual and situational), certain distal determinants positively influenced proximal determinants and certain proximal determinants, in turn, positively impacted self-determined motivation. These findings are congruent with the theoretical postulates underlying SDT (Deci & Ryan, 1985, 1991), the HMIEM (Vallerand, 1997), as well as the results of numerous empirical studies that have found a positive link between distal motivational determinants and proximal motivational determinants and/or between proximal motivational determinants and self-determined motivation (Blanchard & Vallerand, 1996a, 1996b; Brody et al., 1988; Brustad, 1988; Feltz, 1988; Feltz & Mugno, 1983; Fortier et al., 1995; Frederick & Ryan, 1991; Guay & Vallerand, 1996; Losier et al., 1996; Reeve & Deci, 1996; Richer & Vallerand, 1996; Thompson & Wankel, 1980; Vallerand & Guay,

1996; Vallerand et al., 1997; Vallerand & Reid, 1984, 1988; Vlachopoulos et al., 1996; see also Vallerand, 1993, 1997).

In terms of the individual relationships between distal and proximal motivational determinants, as expected, perceptions of success had a positive and direct influence on perceptions of competence at each hierarchical level. These findings are in line with theoretical expectations (Bandura, 1986) and concordant with the results of past research in this area (Brody et al., 1988; Feltz, 1988; Feltz & Mugno, 1983; Vlachopoulos et al., 1996). Perceptions of the motivational climate, on the other hand, had far less of an impact on the three proximal motivational determinants. Specifically, perceptions of a mastery motivational climate were positively linked with perceptions of relatedness at both hierarchical levels but were not related to perceptions of competence or perceptions of autonomy at either level of generality. As for perceptions of a performance motivational climate, only the contextual measure of this distal motivational determinant was negatively linked with contextual perceptions of autonomy. It did not have a significant influence on perceptions of competence or perceptions of relatedness at either the situational or contextual level. It may be that the motivational climate is directly related to motivation and is not mediated by the three proximal determinants. It is also possible that there are fundamental differences between these constructs since perceptions of the motivational climate are based on a conception of goals, whereas perceptions of autonomy, competence, and relatedness are based on a conception of needs. Future research may do well to further explore these possibilities.

In examining the influence of the three proximal motivational determinants on self-determined motivation, findings at the situational level revealed that perceptions of autonomy,

perceptions of competence, and perceptions of relatedness each had a direct and positive impact on self-determined motivation. At the contextual level, perceptions of relatedness also had positively and directly influenced self-determined motivation. The positive influence of perceived relatedness on self-determined motivation at both the situational and contextual level is worth highlighting since few studies have assessed these specific links in sport and physical activity settings (e.g., Blanchard & Vallerand, 1996a, 1996b). Thus, results here add to past research in this domain and demonstrate the salience of this relationship at each level of generality.

There were, however, a number of relationships that were not obtained. For example, contextual perceptions of autonomy and contextual perceptions of competence failed to predict contextual self-determined motivation. These findings ran contrary to predictions and are in disagreement with the theoretical postulated underlying SDT (Deci & Ryan, 1985, 1991) and the HMIEM (Vallerand, 1997). They are also in discord with the results of a multitude of empirical investigations (Brustad, 1988; Fortier et al., 1995; Frederick & Ryan, 1991; Guay & Vallerand, 1996; Losier et al., 1996; Thompson & Wankel, 1980; Vallerand & Guay, 1996; Vallerand et al., 1997). Since, in Article 2, these relationships were measured on a single occasion, it would seem somewhat premature to draw any definitive conclusions regarding the link between these two proximal motivational determinants and self-determined motivation, especially when one considers that the results obtained at the situational level did support these relationships. Results here may be due to several factors including the nature of the master's swimming context and/or the limited sample size. Future research might examine these links in a similar setting, on a temporal basis, and/or with a larger number of participants.

Finally, Article 1 yielded some interesting results with respect to the link between

situational proximal motivational determinants and flow. It was found that flow was positively related to situational perceptions of autonomy, situational perceptions of competence, and situational perceptions of relatedness. These findings suggest there may be a direct link between one or more situational proximal motivational determinant and the experience of flow. Specifically, situational measures of perceived autonomy, competence, and/or relatedness may have a direct impact on this psychological state.

To explore this possibility, supplementary statistical analyses were conducted on the data from Time 1 (see Appendix B). In these analyses, two different models were tested. In the first model, situational perceptions of autonomy, situational perceptions of competence, and situational perceptions of relatedness were regressed onto situational self-determined motivation which, in turn, was regressed onto flow. Situational self-determined motivation therefore mediated the relationship between the three situational motivational determinants and flow. As expected, situational perceptions of autonomy, situational perceptions of competence, and situational perceptions of relatedness were significant predictors of situational self-determined motivation. Situational self-determined motivation also emerged as a salient predictor of the flow state.

In the second model, situational perceptions of autonomy, situational perceptions of competence, situational perceptions of relatedness, and situational self-determined motivation were regressed directly onto flow. Of the four predictor variables, situational perceptions of relatedness and situational perceptions of competence had the greatest direct impact on this psychological state. While situational self-determined motivation also had a significant influence on flow, its impact on the criterion variable was less than either situational perceptions of relatedness or situational perceptions of competence. In terms of situational perceptions of autonomy, it did not

have a direct influence on the flow state. What these findings demonstrate is that situational perceptions of relatedness and situational perceptions of competence have a direct and positive influence on flow and thus, may not be mediated by situational self-determined motivation as predicted by SDT (Deci & Ryan, 1985, 1991) and the HMIEM (Vallerand, 1997). This would also seem to raise questions regarding the theoretical postulates underlying Deci and Ryan's Cognitive Evaluation Theory. Future research could further examine this possibility.

Theoretical Implication Concerning the Relationship between Situational Self-Determined Motivation and Flow

A number of interesting issues were also raised in Article 1 and Article 2 concerning the relationship between situational self-determined motivation and flow. In terms of the general link between these variables, findings from Article 1 and Article 2 serve to clarify the manner in which they are related. In Article 1, situational self-determined forms of motivation (intrinsic motivation and self-determined extrinsic motivation) were more positively associated with flow than situational non self-determined forms of motivation (non self-determined extrinsic motivation and amotivation). Results of the supplementary statistical analyses presented in Appendix B also support this finding. More precisely, the direct link between situational motivation and flow was assessed by regressing the different motivational types onto the flow state. Findings revealed that intrinsic motivation and self-determined extrinsic motivation were both salient predictors of flow, whereas non self-determined extrinsic motivation and amotivation had no direct influence on the experience of this psychological state.

These basic findings support the results of a number of past studies that have examined the relationship between motivation and flow (Csikszentmihalyi & LeFevre, 1989; Graef et al., 1983;

Haworth & Hill, 1992; Iso-Ahola, 1979; Jackson & Roberts, 1992). They also sheds light on the results of Mannell and colleagues (1988) by clarifying how extrinsic forms of motivation, and in particular, self-determined extrinsic motivation and non self-determined extrinsic motivation, are associated with flow states. The positive link between situational self-determined motivation and flow does, however, contradict the results of Stein and colleagues (1995) which failed, in three prospective studies, to support the existence of a positive link between these variables. Findings from Article 1 and Article 2 clearly suggest that situational self-determined motivation is indeed positively associated with the experience of flow.

Results from Article 2 further demonstrate that situational self-determined motivation is a salient predictor of the flow state. This basic finding is particularly important in clarifying the link between situational motivation and flow. What was not assessed in either Article 1 or Article 2 was the direct influence of flow on situational self-determined motivation. It may be that flow has a direct and positive influence on situational self-determined motivation just as situational self-determined motivation has a direct and positive impact on flow. Future research might examine this relationship by using longitudinal designs and/or by employing a statistical technique such as structural equation modeling (SEM).

Finally, from the vantage point of the HMIEM (Vallerand, 1997), the positive link between situational self-determined motivation and flow demonstrates that situational self-determined motivation may have a direct and positive impact on a motivational consequences. This basic finding concurs with the theoretical relationship delineated in the HMIEM and is concordant with the results of numerous investigation in which self-determined motivation have been linked to a wide range of motivational consequences (Fortier & Grenier, in press; Frederick et al., 1996;

Pelletier et al., 1997; Seifriz et al., 1992; Vallerand et al., 1989, 1993; Vallerand & Guay, 1996; Vallerand & Losier, 1994; Walling et al., 1993; Wankel & Sefton, 1989; see also Vallerand, 1993, 1997).

Theoretical Implications Concerning the Influence of Situational Self-Determined Motivation on Contextual Self-Determined Motivation

With respect to the influence of situational self-determined motivation on contextual self-determined motivation, findings from Article 2 demonstrate that situational self-determined motivation has a positive and significant influence on contextual self-determined motivation. In other words, the more one's motivation for engaging in a specific activity was self-determined, the more it was subsequently self-determined towards this activity in general. This finding supports a basic tenet of the HMIEM (Vallerand, 1997), namely, that situational self-determined motivation positively affects contextual self-determined motivation in a bottom-up manner. Findings here are also congruent with the results of a study conducted by Blanchard et al. (1995) in a sport and physical activity setting and thus add empirical support for an important yet relatively unexplored relationship. What was not assessed in Article 2 is the influence of contextual self-determined motivation on situational self-determined motivation. Just as situational motivation is posited to positively influence contextual motivation, contextual motivation is postulated to positively impact situational motivation (Vallerand, 1997). Future studies may do well to examine this link.

Theoretical Implications Concerning the Influence of Flow on Contextual Self-Determined Motivation

In terms of the influence of flow on contextual self-determined motivation, results of

Article 2 revealed that the manner in which these variables are linked has yet to be clarified. While flow failed to predict contextual self-determined motivation, a positive and significant correlation was obtained between these variables. These mixed findings suggest that the relationship between contextual self-determined motivation and flow has yet to be understood, at least, insofar as the master's swimming context is concerned. In theory, experiencing a positive psychological state such as flow while engaged in an activity should enhance self-determined motivation towards that activity in general (see Csikszentmihalyi & Rathunde, 1993). This was empirically demonstrated by Csikszentmihalyi et al. (1993) in a longitudinal study conducted with talented teenagers. Specifically, it was demonstrated that experiencing flow enhanced teenagers' motivation to seek out "optimally challenging" opportunities to improve their skills and abilities. Since, in Article 2, this relationship was assessed on a single occasion and considering that results partially supported predictions, further study is needed in order to clarify this link. Prospective research designs similar to that used by Csikszentmihalyi and colleagues may be useful in this regard.

It should also be mentioned that in terms of the HMIEM (Vallerand, 1997), an important contribution of this thesis was to examine the relationship between motivational consequences at one hierarchical level (situational) and self-determined motivation at another level of generality (contextual). By examining the influence of contextual self-determined motivation on flow, a new link has, in effect, been added to the HMIEM. Since the relationship between situational motivational consequences and contextual self-determined motivation was proposed and tested in the present thesis, it serves to extend Vallerand's theoretical model and opens a number of interesting possibilities concerning future research directions.

Theoretical Implication Concerning the Characteristics of the Flow State

Lastly, results of Article 1 raise a number of questions concerning the characteristics of flow. Findings suggest that certain flow characteristics, for example, a transformation of time and a loss of self-consciousness, were not related to situational forms of motivation in the same manner as other characteristics of this psychological state. It may be that certain flow characteristics are less salient in the master's swimming context. It is also possible that certain characteristics are less sensitive to the different forms of motivation. Examining the different flow characteristics on an individual basis may illuminate this issue.

On a more conceptual level, one may question whether certain flow characteristics are not actually antecedents of this psychological state. If it is true that flow occurs when there is a balance between the perceived skills of the individual and the perceived challenges of the situation, when goals are clear, and when feedback is unambiguous, these characteristics may actually be requisite conditions for flow states to occur. That is, flow may occur *when* skills and challenges are balanced, goals are clear, and feedback is unambiguous. Other flow characteristics such as the *autotelic* or enjoyable nature of the experience seem to describe the phenomenology of this psychological state and as such, may be considered "characteristics." Future studies may also do well to assess this possibility.

Practical Implications

From a practical perspective, the two articles comprising this thesis provide insight into the relationship between motivation and flow. As such, they shed light on the question of what brings about flow states. In Article 1, the positive link between situational self-determined motivation and flow clearly suggests that engaging in physical activity out of personal choice

and/or for enjoyment may facilitate the experience of this psychological state. Results of Article 2 also demonstrate that situational self-determined motivation may positively impact flow. These findings underscore the importance of self-determined motivation to the experience of flow in sport and physical activity settings. From the vantage point of motivation, results of Article 2 serve to forward an understanding of what brings about self-determined motivation. More precisely, they serve to demonstrate how distal motivational determinants influence proximal motivational determinants and how proximal motivational determinants, in turn, affect self-determined motivation. Overall, findings from this thesis may be of value to athletes, coaches, teachers, and/or sport psychology consultants who seek to facilitate the experience of flow and/or promote self-determined motivation in the context of sport and physical activity. They may eventually be used in the development of applied interventions in this domain.

Conclusion

In conclusion, the general purpose of the two journal articles included in this thesis was to examine the relationship between motivation and flow. From the vantage point of flow, both articles contribute to our understanding of how situational motivation and flow are related and demonstrate that situational self-determined forms of motivation have an important and positive influence on the experience of this psychological state. Findings from Article 1 also suggest that situational motivational determinants may play an important role in the experience of flow. Moreover, the value of SDT (Deci & Ryan, 1985, 1991) as a conceptual basis for examining important phenomena such as flow was demonstrated. From a motivational perspective, findings from Article 2 provide support for a number of relationships delineated in the Motivational Model of Flow and thus support the utility and salience of the HMIEM (Vallerand, 1997) as a theoretical

framework for examining motivation towards sport and physical activity. They also serve to extend the HMIEM by adding a new and previously unexplored link to this theoretical model. In short, a number of issues pertaining to motivation and flow were addressed in this thesis. Some of these were illuminated while others have yet to be clarified. Future research may build upon the results of this thesis in striving towards the goal of understanding important constructs such as motivation and flow.

REFERENCES

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49-74.

Ames, C. (1984). Competitive, cooperative, and individualistic goal structures: A cognitive motivational analysis. In R. Ames & C. Ames (Eds.), *Research on motivation in education: Vol.1, Student motivation* (pp. 177-207). New York: Academic Press.

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 161-176). Champaign, IL: Human Kinetics.

Ames, C. & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*, 260-267.

Andree, K. V., & Whitehead, J. (1995, May). *The interactive effect of perceived ability and dispositional or situational achievement goals on intrinsic motivation in young athletes.* Paper presented at the annual meeting of the North American Society of Psychology of Sport and Physical Activity, Monterrey, CA.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social-cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Blais, M. R., & Vallerand, R. J. (1992). *Développement et validation de l'échelle des perceptions d'autonomie dans les domains de vie* [Development and validation of the autonomy perception in life contexts scale]. Unpublished manuscript, Université du Québec à

Montréal.

Blanchard, C., & Vallerand, R. J. (1996a). *On the social and intrapersonal determinants of situational motivation*. Manuscript in preparation, Université du Québec à Montréal.

Blanchard, C., & Vallerand, R. J. (1996b). *Perceptions of competence, autonomy, and relatedness as psychological mediators of the social factors-contextual motivation relationship*. Manuscript in preparation, Université du Québec à Montréal.

Blanchard, C., Vallerand, R. J., & Provencher, P. (1995, October). *Une analyse des effets bidirectionnels entre la motivation contextuelle et la motivation situationnelle en milieu naturel* [An analysis of the bidirectional effects between contextual and situational motivation in a natural setting]. Paper presented at the annual conference of the Québec Society for Research on Psychology, Ottawa.

Brière, N. M., Vallerand, R. J., Blais, M. R., & Pelletier, L. G. (1995). Développement et validation d'une mesure de motivation intrinsèque, extrinsèque et d'amotivation en context sportif: l'Échelle de motivation dans les sports (EMS). [On the development and validation of the French form of the sport motivation scale]. *International Journal of Sport Psychology, 26*, 465-489.

Brody, E. B., Hatfield, B. D., & Spalding, T. W. (1988). Generalization of self-efficacy to a continuum of stressors upon mastery of a high-risk sport skill. *Journal of Sport and Exercise Psychology, 10*, 32-44.

Brustad, R. J. (1988). Affective outcomes in competitive youth sport: The influence of intrapersonal and socialization factors. *Journal of Sport and Exercise Psychology, 10*, 307-

321.

Burton, D. (1992). The Jekyll/Hyde nature of goals: Reconceptualizing goal setting in sport. In T. Horn (Ed.), *Advances in sport psychology* (pp. 267-297). Champaign, IL: Human Kinetics.

Burton, D. (1993). Goal setting in sport. In R. N. Singer, M. Murphey, & L. K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 467-491). New York: Macmillan.

Carli, M., Delle Fave, A., & Massimini, F. (1988). The quality of experience in the flow channels: Comparison of Italian and U.S. students. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 288-306). New York: Cambridge University Press.

Chantal, Y., Guay, F., Dobreva-Martinova, & Vallerand, R. J. (1996). Motivation and elite performance: An exploratory investigation with Bulgarian athletes. *International Journal of Sport Psychology, 27*, 173-182.

Chantal, Y., Guay, F., & Vallerand, R. J. (1996). *Structural analysis of the motivational consequences: A test of the specificity hypothesis*. Manuscript in preparation, Université du Québec à Montréal.

Cohn, P. J. (1991). An exploratory study on peak performance in golf. *The Sport Psychologist, 5*, 1-14.

Csikszentmihalyi, M. (1975a). *Beyond boredom and anxiety*. San Francisco, CA: Jossey-Bass.

Csikszentmihalyi, M. (1975b). Play and intrinsic rewards. *Journal of Humanistic Psychology, 15*, 41-63.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: HarperPerennial.

Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (Eds.). (1988). *Optimal experience: Psychological studies of flow in consciousness.* New York: Cambridge University Press.

Csikszentmihalyi, M., Larson, R., & Prescott, S. (1977). The ecology of adolescent activity and experience. *Journal of Youth and Adolescence, 6,* 281-294.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56,* 815-822.

Csikszentmihalyi, M., & Nakamura, J. (1989). The dynamics of intrinsic motivation: The study of adolescents. In C. Ames & R. Ames (Eds.) *Research on motivation in education* (Vol. 3, pp. 45-71). San Diego, CA: Academic Press.

Csikszentmihalyi, M., & Rathunde, K. (1993). The measurement of flow in everyday life: Toward a theory of emergent motivation. In J. E. Jacobs (Ed.), *Nebraska symposium on motivation, 1992: Developmental perspectives on motivation. Current theory in research in motivation, Vol, 40* (pp. 57-97). Lincoln, NE: University of Nebraska Press.

Csikszentmihalyi, M., Rathunde, K., & Whelan, S. (1993). *Talented teenagers: The roots of success and failure.* New York: Cambridge University Press.

deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior.* New York: Academic Press.

Deci, E. L. (1971). Effects of extrinsically mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology, 18,* 105-115.

Deci, E. L. (1975). *Intrinsic motivation.* New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum Press.

Deci. E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* (pp. 237-288). Lincoln, NE: University of Nebraska Press.

Duda, J. L. (1988). The relationship between goal perspectives and persistence and intensity among recreational sport participants. *Leisure Sciences, 10,* 95-106.

Duda, J. L. (1989). Goal perspectives and behavior in sport and exercise settings. In C. Ames & M. Maehr (Eds.) *Advances in motivation and achievement.* (Vol. 6, pp. 81-115). Greenwich, CT: JAI Press.

Duda, J. L. (1992). Motivation in sport settings: A goal perspective analysis. In G. Roberts (Ed.), *Motivation in sport and exercise* (pp. 57-91). Champaign, IL: Human Kinetics.

Duda, J. L. (1993). Goals: A social-cognitive approach to the study of achievement motivation in sport. In R. N. Singer, M. Murphey, & L. K. Tennant (Eds.), *Handbook or research on sport psychology* (pp. 421-436). New York: Macmillan.

Duda, J. L., & Chi, L. (1989, September). *The effect of task-and ego-involving conditions on perceived competence and causal attributions in basketball.* Paper presented at the meeting of the Association for the Advancement of Applied Sport Psychology, University of Washington, Seattle.

Duda, J. L., Chi, L., & Newton, M. (1990, May). *Psychometric characteristics of the TEOSQ.*

Paper presented at the annual meeting of the North American Society for the Psychology of Sport and Physical Activity, University of Houston, TX.

Duda, J. L., Smart, A., & Tappe, M. (1989). Personal investment in the rehabilitation of athletic injuries. *Journal of Sport and Exercise Psychology, 11*, 367-381.

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.

Dweck, C. S., & Elliot, E. (1983). Achievement motivation. In M. Hetherington (Ed.), *Handbook of child psychology (4th ed.), Vol. 4: Socialization, personality and social development* (pp. 643-691). New York: Wiley.

Ebbeck, V., Gibbons, S. L., & Loken-Dahle, L. J. (1995). Reasons for adult participation in physical activity: An interactional approach. *International Journal of Sport Psychology, 26*, 262-275.

Farthing, G. W. (1992). *The psychology of consciousness*. Englewood Cliffs, NJ: Prentice-Hall.

Feltz, D. L. (1988). Gender differences in the causal elements of self-efficacy on a high avoidance motor task. *Journal of Sport and Exercise Psychology, 10*, 151-166.

Feltz, D. L., & Mugno, D. A. (1983). A replication of the path analysis of the causal elements in Bandura's theory of self-efficacy and the influence of autonomic perception. *Journal of Sport Psychology, 5*, 263-277.

Fortier, M. S. (1994). *Une analyse motivationnelle de la poursuite d'études en sciences* [A motivational analysis of persistence in science]. Unpublished doctoral dissertation, Université du Québec à Montréal, Montréal, Québec, Canada.

Fortier, M. S., & Grenier, M. (in press). Les déterminants personnels et situationnels de l'adhérence à l'exercise: Une étude prospective [Situational and personal determinants of exercise adherence: A prospective study]. *Revue STAPS.*

Fortier, M. S., Vallerand, R. J., Brière, N. M., & Provencher, P. (1995). Competitive and recreational sport structures and gender: A test of their relationship with sport motivation. *International Journal of Sport Psychology, 2*, 24-39.

Fortier, M. S., Vallerand, R. J., & Guay, F. (1995). Academic motivation and school performance: Toward a structural model. *Contemporary Educational Psychology, 20*, 257-274.

Frederick, C. M., Manning, T., & Morrison, C. (1996). Motivation to participate, exercise affect, and outcome behaviors toward physical activity. *Perceptual and Motor Skills, 82*, 691-701.

Frederick, C. M., & Ryan, R. M. (1991). Differences in motivation for sport and exercise and their relation with participation and mental health. *Journal of Sport Behavior, 16*, 124-145.

Frederick, C. M., & Ryan, R. M. (1995). Self-determination in sport: A review using cognitive evaluation theory. *International Journal of Sport Psychology, 26*, 5-23.

Garfield, C. A., & Bennett, H. Z. (1984). *Peak performance: mental training techniques of the world's greatest athletes*. Los Angeles, CA: Tarcher.

Graef, R. M., Csikszentmihalyi, M., & McManama-Gianinno, S. (1983). Measuring intrinsic motivation in everyday life. *Leisure Studies, 2*, 155-168.

Grove, J. R., & Lewis, M. A. E. (1996). Hypnotic susceptibility and the attainment of flowlike

states during exercise. *Journal of Sport & Exercise Psychology, 18*, 380-391.

Guay, F., & Vallerand, R. J. (1995, June). *The situational motivation scale*. Paper presented at the annual convention of the American Psychological Society, New York.

Guay, F., & Vallerand, R. J. (1996). *Social context, students' motivation, and academic achievement: Toward a process model*. Manuscript submitted for publication.

Hall, H. K. (1989). *A social-cognitive approach to goal setting: The mediating effects of achievement goals and perceived ability*. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Han, S. (1988). The relationship between life satisfaction and flow in elderly Korean immigrants. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 138-149). New York: Cambridge University Press.

Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development, 21*, 34-64.

Harter, S. (1982). The perceived competence scale for children. *Child Development, 53*, 87-97.

Haworth, J. T., & Hill, S. (1992). Work, leisure, and psychological well-being in a sample of young adults. *Journal of Community & Applied Psychology, 2*, 147-160.

Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.

Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*. New York: Appleton-Century-Crofts.

Iso-Ahola, S. E. (1979). Basic Dimensions of Definitions of Leisure. *Journal of Leisure*

Research, 11, 28-39.

Jackson, S. A. (1992). Athletes in flow: A qualitative investigation of flow states in elite figure skaters. *Journal of Applied Sport Psychology, 4*, 161-180.

Jackson, S. A. (1993). Elite athletes in flow: The psychology of optimal sport experience (Doctoral dissertation, University of North Carolina at Greensboro, 1993). *Dissertation Abstracts International, 54*, 124-A.

Jackson, S. A. (1995). Factors influencing the occurrence of flow state in elite athletes. *Journal of Applied Sport Psychology, 7*, 138-166.

Jackson, S. A., & Marsh, H. (1996). Development and validation of a scale to measure optimal experience: The Flow State Scale. *Journal of Sport & Exercise Psychology, 18*, 17-35.

Jackson, S. A., & Roberts, G. C. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. *The Sport Psychologist, 6*, 156-171.

Kavussanu, M. & Roberts, G. C. (1996). Motivation in physical activity contexts: The relationship of perceived motivational climate to intrinsic motivation and self-efficacy. *Journal of Sport and Exercise Psychology, 18*, 264-280.

Kimiecik, J. C., & Stein, G. L. (1992). Examining flow experiences in sport contexts: Conceptual issues and methodological concerns. *Journal of Applied Sport Psychology, 4*, 144-160.

Kowal, J., & Fortier, M. S. (in press). Motivational determinants of flow: Contributions from self-determination theory. *Journal of Social Psychology*.

Larson, R. (1988). Flow and writing. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.),

Optimal experience: Psychological studies of flow in consciousness (pp. 150-171). New York: Cambridge University Press.

Lee, P. R., Ornstein, R. E., Galin, D., Deikman, A. J., & Tart, C. T. (Eds.). (1976). *Symposium on consciousness*. New York: Viking Press.

Lepper, M. R., & Greene, D. (Eds.). (1978). *The hidden costs of reward*. Hillsdale, NJ: Erlbaum.

Li, F., & Harmer, P. (1994, October). *Goal orientations and motivation in sport: An intrinsic-extrinsic motivational perspective*. Paper presented at the meeting of the Association for the Advancement of Applied Sport Psychology, Lake Tahoe, NV.

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice-Hall.

Loehr, J. (1986). *Mental toughness training for sports*. Lexington, MA: The Stephen Greene Press.

Losier, G. F., Vallerand, R. J., Provencher, P., Fortier, M. S., Senécal, C. B., & Rinfret, N. (1996). *Persistence in graduate school: A motivational analysis*. Manuscript in preparation.

Maehr, M. L. (1984). Meaning and motivation: Toward a theory of personal investment. In R. Ames & C. Ames (Eds.), *Research on motivation in education: Vol. 1. Student motivation* (pp. 38-61). New York: Academic Press.

Mannell, R. C., Zuzanek, J., & Larson, R. (1988). Leisure states and "flow" experiences: Testing perceived freedom and intrinsic motivation hypotheses. *Journal of Leisure*

Research, 20, 289-304.

Martens, R. (1982). *Sport competition anxiety test*. Champaign, IL: Human Kinetics.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370-396.

Maslow, A. H. (1968). *Toward a psychology of being* (2nd ed.). New York: Van Nostrand Reinhold.

Massimini, F. & Carli, M. (1986). La selezione psicologica smontara biologica e cultura [Psychological selection refutes biology and culture]. In F. Massimini & P. Inqhilleri (Eds.), *L'esperienza quotidiana* [Daily experience] (pp. 65-81). Milan: Franco Angeli.

Massimini, F., Csikszentmihalyi, M., & Delle Fave, A. (1988). Flow and biocultural evolution. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 60-81). New York: Cambridge University Press.

McInman, A. D., & Grove, J. R. (1991). Peak moments in sport: A literature review. *Quest, 43*, 333-351.

Murphy, M., & White, R. A. (1995). *In the zone: Transcendent experience in sports* (2nd ed.). New York: Penguin/Arkana.

Nakamura, J. (1988). Optimal experience and the uses of talent. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 319-326). New York: Cambridge University Press.

Newton, M. L. (1994, October). *The relationship between perceived motivational climate and dispositional goal orientation on selected indices of intrinsic motivation*. Paper presented

at the meeting of the Association for the Advancement of Applied Sport Psychology, Lake Tahoe, NV.

Nicholls, J. (1984). Conceptions of ability and achievement motivation. In R. Ames & C. Ames (Eds.), *Research on motivation in education: Student motivation* (Vol. 1, pp. 39-71). New York: Academic Press.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.

Nicholls, J. G. (1992). The general and specific in the development and expression of achievement motivation. In G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 31-56). Champaign, IL: Human Kinetics.

Pedhazur, E. J. (1982). *Multiple regression in behavioral research*. New York: Holt, Rinehart, and Winston.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., & Brière, N. M. (1997). *Perceived autonomy support, levels of self-determination, and persistence: A longitudinal study*. Manuscript submitted for publication.

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., Brière, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *Journal of Sport and Exercise Psychology, 17*, 35-53.

Pelletier, L. G., & Vallerand, R. J. (1993). Une perspective humaniste de la motivation: Les théories de la compétence et de l'autodétermination [A humanistic perspective on

motivation: Theories of competence and self-determination]. In R. J. Vallerand & E. Thill (Eds.), *Introduction à la psychologie de la motivation* [Introduction to the psychology of motivation] (pp. 233-281). Montréal: Études Vivantes.

Petri. H. L. (1996). *Motivation: Theory, research, and applications* (4th ed.). Pacific Grove, CA: Brooks/Cole.

Privette, G. (1981a). Dynamics of peak performance. *Journal of Humanistic Psychology, 21*, 57-67.

Privette, G. (1981b). The phenomenology of peak performance in sports. *International Journal of Sport Psychology, 12*, 51-60.

Privette, G. (1983). Peak performance, peak performance, and flow: A comparative analysis of positive human experiences. *Journal of Personality and Social Psychology, 45*, 1361-1368.

Privette, G., & Bundrick, C. M. (1991). Peak experience, peak performance, and flow: Correspondence of personal descriptions and theoretical constructs. *Journal of Social Behaviour and Personality, 6*, 169-188.

Privette, G., & Landsman, T. (1983). Factor analysis of peak performance: The full use of potential. *Journal of Personality and Social Psychology, 44*, 195-200.

Ravizza, K. (1984). Qualities of the peak experience in sport. In J. M. Silva & R. S. Weinberg (Eds.), *Psychological foundations of sport* (pp. 452-461). Champaign, IL: Human Kinetics.

Reeve. J., & Deci, E. L. (1996). Elements of the competitive situation that affect intrinsic motivation. *Personality and Social Psychology Bulletin, 22*, 24-33.

Richer, S., & Vallerand, R. J. (1996). *Construction et validation de l'échelle du sentiment d'appartenance social (ÉSAS)* [Construction and validation of the Perceived Relatedness Scale]. Manuscript submitted for publication.

Roberts, G. C. (Ed.). (1992a). *Motivation in sport and exercise*. Champaign, IL: Human Kinetics.

Roberts, G. C. (1992b). Motivation in sport and exercise: Conceptual constraints and convergence. In G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 3-29). Champaign, IL: Human Kinetics.

Roberts, G. C. (1993). Motivation in sport: Understanding and enhancing the motivation and achievement of children. In R. N. Singer, M. Murphey, & L. K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 405-420). New York: Macmillan.

Roberts, G. C., Hall, H., Jackson, S., Kimiecik, J. C., & Tonymon, P. (1990, September). *Goal orientations and perceptions of the sport experience*. Paper presented at the meeting of the Association for the Advancement of Applied Sport Psychology, San Antonio, TX.

Rotter, J. B. (1954). *Social learning and clinical psychology*. Englewood Cliffs: NJ: Prentice-Hall.

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*, 56-67.

Ryan, R. M., Connell, J. P., & Grolnick, W. S. (1990). When achievement is not intrinsically motivated: A theory of self-regulation in school. In A. K. Boggiano & T. S. Wittman

(Eds.), *Achievement and motivation: A social-developmental perspective* (pp. 167-188). New York: Cambridge University Press.

Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport and Exercise Psychology, 14*, 375-391.

Stein, G. L., Kimiecik, J. C., Daniels, J., & Jackson, S. A. (1995). Psychological antecedents of flow in recreational sport. *Personality and Social Psychology Bulletin, 21*, 125-135.

Stewart, D. G., Green-Demers, I., Pelletier, L. G., & Tuson, K. M. (1995, June). *Is helplessness a dimension of environment amotivation? New development in the Amotivation Towards the Environment Scale (AMTES).* Paper presented at the Annual Canadian Psychological Association convention, Charlottetown, P.E.I.

Tart, C. T. (1975). *States of consciousness*. New York: E. P. Dutton.

Thill, E., & Vallerand, R. J. (Eds.). (1995). Motivation and emotion in the sport context. *International Journal of Sport Psychology*, 26(1).

Thompson, C. E., & Wankel, L. M. (1980). The effect of perceived ability choice upon frequency of exercise behavior. *Journal of Applied Social Psychology, 10*, 436-443.

Tinsley, H. E. A., & Tinsley, D. J. (1986). A theory of attributes, benefits, and causes of leisure experiences. *Leisure Sciences, 8*, 1-45.

Tuson, K. M., & Pelletier, L. G. (1992, November). *Why do people lack motivation to help save the environment? A predictive model.* Paper presented at the annual convention of the Québec Society for Research in Psychology, Montréal.

Vallerand, R. J., (1993). La motivation intrinsèque et extrinsèque en milieu naturel: Implications pour les secteurs de l'éducation, du travail, des relations interpersonelles et des loisirs [Intrinsic and extrinsic motivation in the natural contexts: Implications for the education, work, interpersonal relationships, and leisure contexts]. In R. J. Vallerand & E. Thill (Eds.), *Introduction à la psychologie de la motivation* [Introduction to the psychology of motivation] (pp. 533-581). Montréal: Études Vivantes.

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271-360). New York: Academic Press.

Vallerand, R. J., & Bissonnette, R. (1992). Intrinsic, extrinsic, and amotivational styles as predictors of behavior: A prospective study. *Journal of Personality, 60*, 599-620.

Vallerand, R. J., Blais, M. R., Brière, N. M., & Pelletier, L. G. (1989). Construction et validation de l'Échelle de motivation en éducation (EME) [On the construction and validation of the French form of the academic motivation scale]. *Canadian Journal of Behavioural Science, 21*, 323-349.

Vallerand, R. J., Deci, E. L., & Ryan, R. M. (1987). Intrinsic motivation in sport. *Exercise and Sport Sciences Review, 15*, 389-425.

Vallerand, R. J., Fortier, M. S., & Guay. F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology, 72*, 1161-1176.

Vallerand, R. J., & Guay, F. (1996). *A confirmatory test of the hierarchical motivational model*

of intrinsic and extrinsic motivation. Manuscript in preparation, Université du Québec à Montréal.

Vallerand, R. J., & Losier, G. F. (1994). Self-determined motivation and sportsmanship orientations: An assessment of their temporal relationship. *Journal of Sport and Exercise Psychology, 16*, 229-245.

Vallerand, R. J., & O'Connor, B. P. (1989). Motivation in the elderly: A theoretical framework and some promising findings. *Canadian Psychology, 30*, 538-550.

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement, 52*, 1003-1019.

Vallerand, R. J., Pelletier, L. G., Blais, M. R., Brière, N. M., Senécal, C., & Vallières, E. F. (1993). On the assessment of intrinsic, extrinsic, and amotivation in education: Evidence on the concurrent and construct validity of the Academic Motivation Scale. *Educational and Psychological Measurement, 53*, 159-172.

Vallerand, R. J., & Reid, G. (1984). On the causal effects of perceived competence on intrinsic motivation: A test of cognitive evaluation theory. *Journal of Sport Psychology, 6*, 94-102.

Vallerand, R. J., & Reid, G. (1988). On the relative effects of positive and negative verbal feedback on males' and females' intrinsic motivation. *Canadian Journal of Behavioural Sciences, 20*, 239-250.

Vallerand, R. J., & Thill, E. (1993a). Introduction au concept de motivation [An introduction to the concept of motivation]. In R. J. Vallerand & E. Thill (Eds.), *Introduction à la*

psychologie de la motivation [An introduction to the psychology of motivation] (pp. 3-39). Montréal: Études Vivantes.

Vallerand, R. J., & Thill, E. (Eds.). (1993b). *Introduction à la psychologie de la motivation* [An introduction to the psychology of motivation] (pp. 3-39). Montréal: Études Vivantes.

Vealey, R. S. (1986). Conceptualization of sport-confidence and competitive orientation: Preliminary investigation and instrument development. *Journal of Sport Psychology, 8*, 221-246.

Vealey, R. S. (1988). Sport-confidence and competitive orientation: An addendum on scoring procedures and gender differences. *Journal of Sport and Exercise Psychology, 10*, 471-478.

Vlachopoulos, S., Biddle, S., & Fox, K. (1996). A social cognitive investigation into the mechanism of affect generation in children's physical activity. *Journal of Sport and Exercise Psychology, 18*, 174-193.

Walling, M. D., Duda, J. L. & Chi, L. (1993). The perceived motivational climate in sport questionnaire: Construct and predictive validity. *Journal of Sport and Exercise Psychology, 15*, 172-183.

Wankel, L. M., & Sefton, J. M. (1989). A season-long investigation of fun in youth sports. *Journal of Sport and Exercise Psychology, 11*, 355-366.

Wells, A. J. (1988). Self-esteem and optimal experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 327-341). New York: Cambridge University Press.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297-333.

Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology, 70*, 115-126.

Williams, J. M., & Krane, V. (1993). Psychological characteristics of peak performance. In J. M. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* (2nd ed.) (pp. 137-147). Mountain View, CA: Mayfield.

Wolman, B. B., & Ullman, M. (Eds.). (1986). *Handbook of states of consciousness*. New York: Van Nostrand Reinhold.

APPENDIX A

CONTRIBUTIONS OF THE COLLABORATORS

The relative contributions of the two authors listed on the journal articles comprising this thesis are outlined in this appendix.

The names of two authors appear on each of the journal articles included in this thesis; John Kowal and Dr. Michelle Fortier. The inclusion of two authors denotes that each of us played a prominent role in the processes of conducting this research project and of writing these articles.

In terms of conducting this research project, Dr. Fortier and I were jointly instrumental in the initial conceptualization of the investigation. In essence, Dr. Fortier's expertise and knowledge in the area of motivation was allied with my knowledge and interest in the area of flow in giving rise to the overall project.

With regards to data collection, Dr. Fortier and I were both implicated in the development of the situational and contextual questionnaires. I was primarily involved in adapting previously developed instruments and in the mechanics of compiling the questionnaires. My responsibilities also included contacting the various master's level swim clubs, arranging to attend the swim practices, recruiting participants, and administering the questionnaires. These tasks were all carried out under the watchful eye of Dr. Fortier. It should also be mentioned that I was fortunate to receive the assistance of three colleagues in administering the questionnaires.

Finally, I was primarily responsible for conducting the data analysis. Again, this was carried out under the supervision of Dr. Fortier.

Throughout the entire research project, I had regularly meetings with Dr. Fortier. During these meetings, the various stages involved in this undertaking were conceptualized, discussed, and planned.

In terms of the writing of the two journal articles, it was my primary responsibility to

produce initial drafts of all sections included therein. Each draft was then read by Dr. Fortier who made suggestions for improvement. Through the process of editing and revision, these articles evolved into what is presented in this thesis today. It is also important to note that at the time of submission of this thesis, Article 1, *Motivational Determinants of Flow: Contribution from Self-Determination Theory*, has been accepted for publication in the *Journal of Social Psychology*. It has therefore been subject to the review process characteristic of academic journals. The principal modification made to this paper, following the reviewer's comments, was to shorten its length. Apart from this reduction in verbiage, revisions made to this article were minimal.

APPENDIX B

SUPPLEMENTARY STATISTICAL INFORMATION AND ANALYSES

The supplementary statistical information and analyses included in this appendix were added at the recommendation of the thesis committee members and pertain specifically to Article 1, *Motivational Determinants of Flow: Contribution from Self-Determination Theory*.

Supplementary Statistical Information

In Article 1, a low-and high-incidence of flow group was compared across a number of motivational variables. To supplement the information included in this article, the mean, standard deviation, and range of the low-and high-incidence of flow groups are presented in Table 1.

Table 1
Mean, Standard Deviation, and Range of Participants in the Low-and High-Incidence of Flow Groups

Group	*n*	*M*	*SD*	Range
Low-Incidence of Flow	68	3.94	.49	2.00 - 4.44
High-Incidence of Flow	67	5.59	.45	5.08 - 6.89

Supplementary Statistical Analyses

The statistical analyses conducted in Article 1 consisted of correlations and t-tests. To gain further insight into the relationship between motivation and flow, a series of multiple regressions was performed. To assess the nature of the relationship between situational determinants, situational self-determined motivation, and flow, two models were tested. In the first model (Figure 1), situational perceptions of autonomy, situational perceptions of competence, and

situational perceptions of relatedness were regressed onto situational self-determined motivation which, in turn, was regressed onto flow. Results revealed that situational perceptions of autonomy ($\beta = .30, p < .01$), situational perceptions of competence ($\beta = .36, p < .01$), and situational perceptions of relatedness ($\beta = .33, p < .01$) were significant predictors of situational self-determined motivation. These three situational motivational determinants accounted for 48% of the variance in the criterion variable. Situational self-determined motivation also emerged as a salient predictor of flow ($\beta = .50, p < .01$). A total of 25% of the variance in flow was explained by this predictor variable.

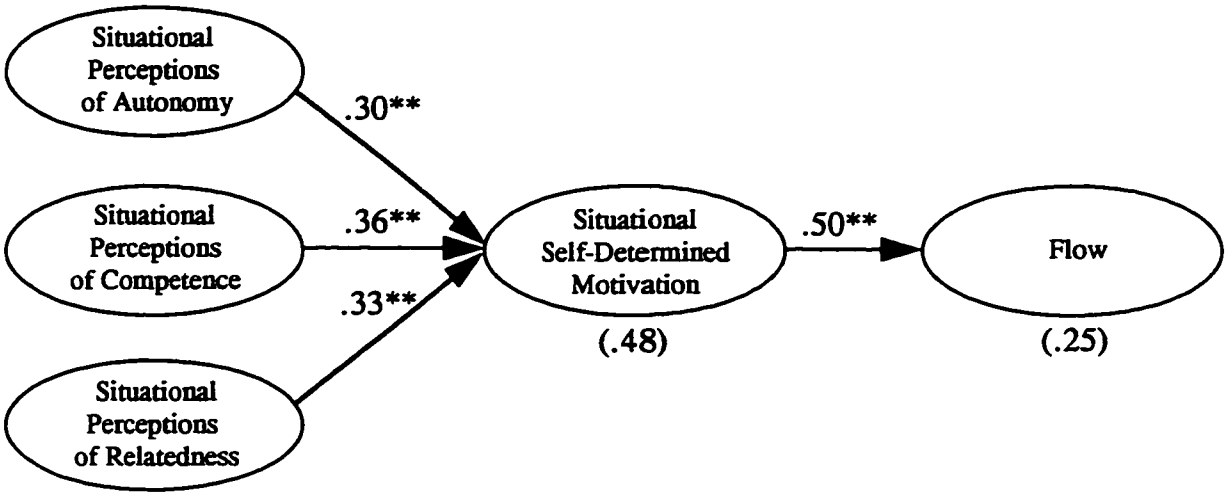


Figure 1. **Path Diagram Delineating Situational Motivation as a Mediator between Situational Motivational Determinants and Flow. ** $p < .01$. $n = 203$.**

In the second model (Figure 2), situational perceptions of autonomy, situational perceptions of competence, situational perceptions of relatedness, and situational self-determined

motivation were regressed directly onto flow. Situational perceptions of relatedness ($\beta = .36$, $p < .01$), situational perceptions of competence ($\beta = .22$, $p < .01$), and situational self-determined motivation ($\beta = .20$, $p < .05$) all had a significant, positive, and direct impact on flow. Situational perceptions of autonomy had no influence on the experience of this psychological state ($\beta = .02$, $p = .771$). These four predictors explained 38% of the variance in flow.

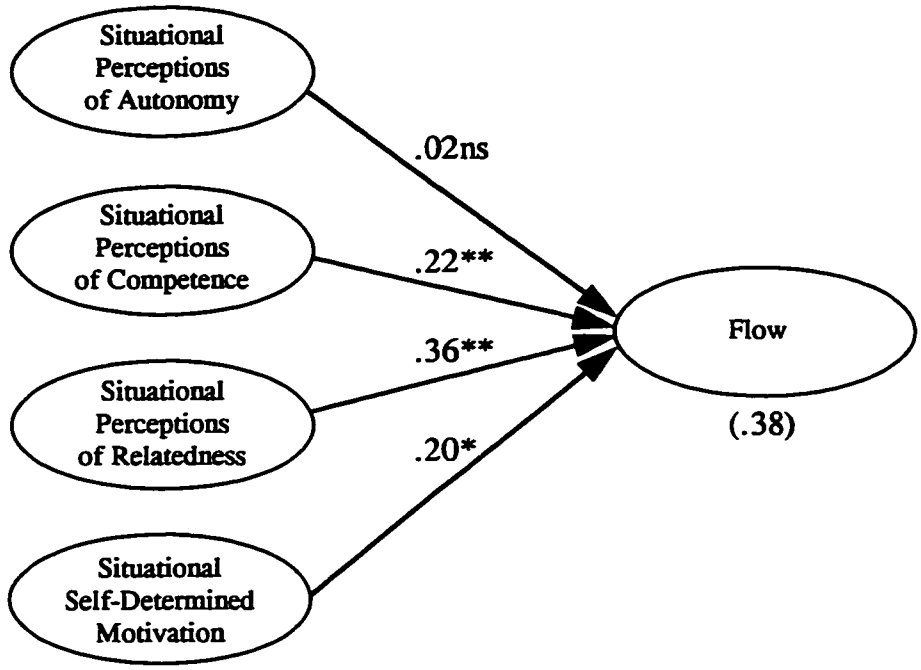


Figure 2. **Multiple Regression of Situational Motivation and Situational Motivational Determinants onto Flow. * $p < .05$. ** $p < .01$. $n = 203$.**

The specific link between situational motivation and flow was also examined. Specifically, the four different types of situational motivation were regressed onto the flow state (Figure 3). Both intrinsic motivation ($\beta = .51$, $p < .01$) and self-determined extrinsic motivation ($\beta = .18$,

$p < .01$) emerged as significant predictors of flow, whereas non self-determined extrinsic motivation ($\beta = -.01$, $p = .877$ and amotivation ($\beta = .02$, $p = .768$) did not directly impact the experience of this psychological state. Thirty-seven percent of the variance in flow was accounted for by these four types of situational motivation.

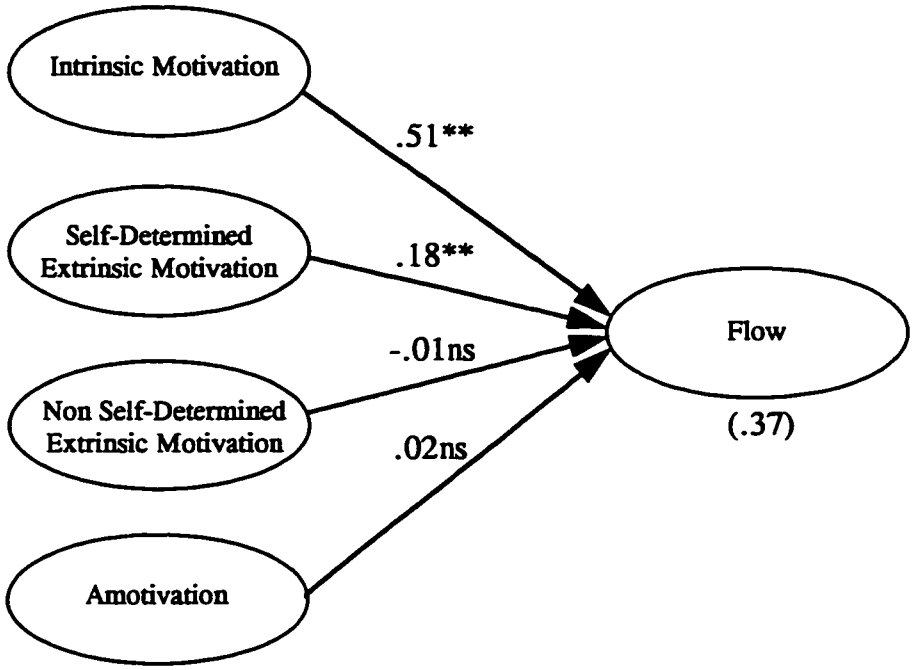


Figure 3. **Multiple Regression of Different Forms of Situational Motivation onto Flow. ** $p < .01$. $n = 203$.**

APPENDIX C

SITUATIONAL QUESTIONNAIRE

Note. The items used in the articles have been italicized.

ATTITUDES, PERCEPTIONS, AND MOTIVATION TOWARDS SWIMMING

We are presently conducting a study which aims to better understand attitudes, perceptions, and motivation towards sport and physical activity. The following pages consist of questions regarding your involvement ***in the swim practice you just finished.*** Please read each question carefully and indicate (by circling the appropriate number) the extent to which the questions correspond to this swimming experience. It is important to answer, i.e., circle, a number for each and every question.

This is neither a test nor an evaluation. ***Therefore, there are no correct or incorrect answers.*** We are simply interested in your ***honest*** and ***truthful*** responses to the questions. ***Please ensure that you carefully read all of the instructions before answering the questions.***

It is not necessary to write your name on the questionnaire, however for the study to be conducted successfully, we require your date of birth and the last 4 digits of your telephone number. ***The information that you provide us with is strictly confidential and will be used for research purposes only.***

DATE OF BIRTH (DAY/MONTH/YEAR) : _____/_____/_____

TELEPHONE NUMBER (LAST 4 DIGITS) : _____

We thank you for your participation.

John Kowal and Michelle Fortier, Ph.D.
School of Human Kinetics
University of Ottawa
Fall, 1996

PLEASE NOTE :

THE FOLLOWING QUESTIONS ARE RELATED TO THE SWIM PRACTICE YOU JUST FINISHED.

---

1. TEAM CLIMATE IN THIS SWIM PRACTICE

The following statements concern the team climate in the swim practice you just finished. Using the scale below, indicate the degree to which you are in agreement with each item by circling the most appropriate number.

Strongly Disagree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

During the practice I just finished...

1. ...each swimmer's improvement was important.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. ...the coach had his/her favorites.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3. ...the focus during practice was on individual improvement.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. ...doing better than teammates was important.	1	2	3	4	5	6	7
5. ...there was a cooperative atmosphere.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
6. ...the coach favored some swimmers more than others.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
7. ...trying hard was important.	1	2	3	4	5	6	7
8. ...swimmers tried to out-perform teammates.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
9. ...swimmers encouraged each other.	1	2	3	4	5	6	7
10. ...the coach compared swimmers.	1	2	3	4	5	6	7

---

2. PERCEPTIONS OF SUCCESS IN THIS SWIM PRACTICE

Using the scale below, please indicate the degree to which you are in agreement with each of the following items concerning your perceptions of success in the swim practice you just finished.

Strongly Disagree			**Moderately Agree**			**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I performed favorably in this swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. My performance in this swim practice was not very successful.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3. This swim practice was a success.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. In this swim practice, I did not do very well.	1	2	3	4	5	6	7

3. SELF-PERCEPTIONS 1

Listed below are a number of statements concerning the swim practice you just finished. Read each item and decide to what extent you are in agreement by circling the most appropriate response.

Strongly Disagree			**Moderately Agree**			**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I felt competent during this swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. I felt I participated in this swim practice out of personal choice.	1	2	3	4	5	6	7
3. This swim practice was easier for me than for others.	1	2	3	4	5	6	7
4. I felt I had to swim in this practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
5. I felt strong and smooth during this swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
6. I felt I had to push myself or get pushed to practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
7. I felt hopeless during this swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8. I felt obligated to be at this swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*

4. SELF-PERCEPTIONS 2

Listed below are a number of statements concerning your relations with your teammates during the swim practice you just finished. Read each item and decide to what extent you are in agreement by circling the most appropriate number.

Strongly Disagree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

During this practice, in my relations with the members of my current swim team, I felt...

1. ...supported.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. ...related.	1	2	3	4	5	6	7
3. ...understood.	1	2	3	4	5	6	7
4. ...isolated.	1	2	3	4	5	6	7
5. ...attached.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
6. ...listened to.	1	2	3	4	5	6	7
7. ...united.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8. ...alienated.	1	2	3	4	5	6	7
9. ...close.	1	2	3	4	5	6	7
10. ...affiliated	1	2	3	4	5	6	7

5. MOTIVATION TOWARDS SWIMMING

Using the following scale, please indicate to what extent you are in agreement with the items that correspond to your involvement in the practice you have just finished. Each item relates to the question "Why did you participate in this swim practice?"

Strongly Disgree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

Why did you participate in this swim practice?

1. *Because swimming in this practice was really enjoyable.*	1	2	3	4	5	6	7
2. *Because I chose to swim for by own benefit.*	1	2	3	4	5	6	7
3. *Because I felt it was something I had to do.*	1	2	3	4	5	6	7
4. *I don't know; I don't think I gained anything from the experience.*	1	2	3	4	5	6	7
5. *Because I felt good while swimming in this practice.*	1	2	3	4	5	6	7
6. *Because I believe this practice was important.*	1	2	3	4	5	6	7
7. *Because I felt I was expected to swim.*	1	2	3	4	5	6	7
8. *I swam in this practice but am not sure it was worth the effort.*	1	2	3	4	5	6	7
9. *Because I found this swim practice pleasurable.*	1	2	3	4	5	6	7
10. *Because I wished to swim in this practice.*	1	2	3	4	5	6	7
11. *Because swimming in this practice was something I had to do.*	1	2	3	4	5	6	7
12. *I swam in this practice but asked myself if it was worth it.*	1	2	3	4	5	6	7
13. *Because this practice was fun.*	1	2	3	4	5	6	7
14. *Because I believed that swimming in this practice was good for me.*	1	2	3	4	5	6	7
15. *Because I did not feel I had any other choice except to swim.*	1	2	3	4	5	6	7
16. *Perhaps there are good reasons for swimming but I personally did not have any.*	1	2	3	4	5	6	7

6. PSYCHOLOGICAL STATE SCALE

Listed below are a number of statements concerning the thoughts and feelings you experienced during the practice you just finished. Read each item and decide to what extent you are in agreement by circling the most appropriate response.

Strongly Disgree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

1. *I was challenged, but I believed my skills would allow me to meet the challenge.*	1	2	3	4	5	6	7
2. *I made the correct movements without thinking about trying to do so.*	1	2	3	4	5	6	7
3. *I knew clearly what I wanted to do.*	1	2	3	4	5	6	7
4. *It was really clear to me what I was doing well.*	1	2	3	4	5	6	7
5. *My attention was focused entirely on what I was doing.*	1	2	3	4	5	6	7
6. *I felt in total control of what I was doing.*	1	2	3	4	5	6	7
7. *I was not concerned with what others may have been thinking of me.*	1	2	3	4	5	6	7
8. *Timed seemed to alter (either slowed down or sped up).*	1	2	3	4	5	6	7
9. *I really enjoyed the experience.*	1	2	3	4	5	6	7
10. *My abilities matched the high challenge of the situation.*	1	2	3	4	5	6	7
11. *Things just seemed to be happening automatically.*	1	2	3	4	5	6	7
12. *I had a strong sense of what I wanted to do.*	1	2	3	4	5	6	7
13. *I was aware of how well I was performing.*	1	2	3	4	5	6	7
14. *It was no effort to keep my mind on what was happening.*	1	2	3	4	5	6	7
15. *I felt like I could control what I was doing.*	1	2	3	4	5	6	7
16. *I was not worried about my performance during this practice.*	1	2	3	4	5	6	7
17. *The way time passed seemed to be different from normal.*	1	2	3	4	5	6	7
18. *I loved the feeling of this performance and want to re-capture it.*	1	2	3	4	5	6	7
19. *I felt I was competent enough to meet the high demands of the situation.*	1	2	3	4	5	6	7
20. *I performed automatically.*	1	2	3	4	5	6	7
21. *I knew what I wanted to achieve.*	1	2	3	4	5	6	7

22. *I had a good idea while I was performing about how well I was doing.*	1	2	3	4	5	6	7
23. *I had total concentration.*	1	2	3	4	5	6	7
24. *I had a feeling of total control.*	1	2	3	4	5	6	7
25. *I was not concerned with how I was presenting myself.*	1	2	3	4	5	6	7
26. *It felt like time stopped while I was performing.*	1	2	3	4	5	6	7
27. *The experience left me feeling great.*	1	2	3	4	5	6	7
28. *The challenge and my skills were at an equally high level.*	1	2	3	4	5	6	7
29. *I did things spontaneously and automatically without having to think.*	1	2	3	4	5	6	7
30. *My goals were clearly defined.*	1	2	3	4	5	6	7
31. *I could tell by the way I was performing how well I was doing.*	1	2	3	4	5	6	7
32. *I was completely focused on the task at hand.*	1	2	3	4	5	6	7
33. *I felt in total control of my body.*	1	2	3	4	5	6	7
34. *I was not worried about what others may have been thinking about me.*	1	2	3	4	5	6	7
35. *At times, it almost seemed like things were happening in slow motion.*	1	2	3	4	5	6	7
36. *I found the experience extremely rewarding.*	1	2	3	4	5	6	7

7. Background

Age : _____

Gender : Female _____ Male _____

For which club do you swim? _____

Do you compete on a regular basis? Yes _____ No _____

How many times a week do you swim? _____

How many years have you been swimming with this club? _____

We thank you very much for your participation!

IF YOU ARE INTERESTED IN PARTICIPATING IN THE SECOND PART OF THIS STUDY, I.E. INTERVIEWS, PLEASE WRITE YOUR NAME AND TELEPHONE NUMBER.

Name:

Telephone number:

APPENDIX D

CONTEXTUAL QUESTIONNAIRE

Note. The items used in the articles have been italicized.

ATTITUDES, PERCEPTIONS, AND MOTIVATION TOWARDS SWIMMING

We are presently conducting a study which aims to better understand attitudes, perceptions, and motivation towards sport and physical activity. The following pages consist of questions regarding your involvement in swimming. Please read each question carefully and indicate (by circling the appropriate number) the extent to which the questions correspond to your personal swimming experience. It is important to answer, i.e., circle, a number for each and every question.

This is neither a test nor an evaluation. ***Therefore, there are no correct or incorrect answers.*** We are simply interested in your ***honest*** and ***truthful*** responses to the questions. ***Please ensure that you carefully read all of the instructions before answering the questions.***

It is not necessary to write your name on the questionnaire, however for the study to be conducted successfully, we require your date of birth and the last 4 digits of your telephone number. ***The information that you provide us with is strictly confidential and will be used for research purposes only.***

DATE OF BIRTH (DAY/MONTH/YEAR) : _____/_____/_____

TELEPHONE NUMBER (LAST 4 DIGITS) : _____

We thank you for your participation.

John Kowal and Michelle Fortier, Ph.D.
School of Human Kinetics
University of Ottawa
Fall, 1996

1. TEAM CLIMATE

The following statements concern your current swim team. Using the scale below, indicate the degree to which you are in agreement with each item by circling the most appropriate number.

Strongly Disagree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

In general, on my current swim team...

1. ...each swimmer's improvement is important.	1	2	3	4	5	6	7
2. ...the coach has his/her favorites.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3. ...swimmers help each other to improve and excel.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. ...only the top swimmers get noticed.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
5. ...the focus during practices is on individual improvement.	1	2	3	4	5	6	7
6. ...doing better than teammates is important.	1	2	3	4	5	6	7
7. ...the coach focuses on skill improvement.	1	2	3	4	5	6	7
8. ...the coach compares swimmers.	1	2	3	4	5	6	7
9. ...there is a cooperative atmosphere.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
10. ...the coach favors some swimmers more than others.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
11. ...trying hard is important.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
12. ...swimmers try to out-perform teammates.	1	2	3	4	5	6	7

2. PERCEPTIONS OF PAST SUCCESS IN SWIMMING

Using the scale below, please indicate the degree to which you are in agreement with each of the following items concerning your perceptions of your past success in swimming.

Strongly Disagree			**Moderately Agree**			**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

1. *In the past, I have often succeeded in swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. *My past swimming experiences have not been very successful.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3. *Up to this point in time, I have performed favorably in swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. In the past, I have not done very well in swimming.	1	2	3	4	5	6	7

3. SELF-PERCEPTIONS 1

Listed below are a number of statements. Read each item and decide to what extent you are in agreement by circling the most appropriate response.

Strongly Disagree			**Moderately Agree**			**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

1. I believe I have a natural talent for swimming.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. I swim out of personal choice.	1	2	3	4	5	6	7
3. I succeed easily in swimming.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. I often feel I have to go to swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
5. I consider myself to be a good swimmer.	1	2	3	4	5	6	7
6. I often have to push myself or get pushed to go to swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
7. I am very confident in my swimming abilities.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8. I often feel obligated to go to swim practice.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
9. I believe I am a good swimmer.	1	2	3	4	5	6	7

4. SELF-PERCEPTIONS 2

Listed below are a number of statements concerning your relations with the members of your current swim team. Read each item and decide to what extent you are in agreement by circling the most appropriate number.

Strongly Disagree			Moderately Agree			Strongly Agree
1	2	3	4	5	6	7

In my relations with the members of my current swim team, I feel...

1. ...supported.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. ...related.	1	2	3	4	5	6	7
3. ...understood.	1	2	3	4	5	6	7
4. ...isolated.	1	2	3	4	5	6	7
5. ...attached.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
6. ...listened to.	1	2	3	4	5	6	7
7. ...united.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8. ...alienated.	1	2	3	4	5	6	7
9. ...close.	1	2	3	4	5	6	7
10. ...affiliated	1	2	3	4	5	6	7

5. MOTIVATION TOWARDS SWIMMING

Using the scale below, please indicate to what extent you are in agreement with the following items concerning your reasons for participating in swimming.

Strongly Disagree — **Moderately Agree** — **Strongly Agree**

1 2 3 4 5 6 7

In general, why do you swim?

1. *For the pleasure I feel in living exciting experiences such as swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
2. *Because people around me think it is important to be in shape.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
3. *I used to have good reasons for swimming, but now I am asking myself if I should continue doing it.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
4. *For the prestige of being an athlete.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
5. *For the pleasure of discovering new skills/techniques.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
6. *I don't know anymore; I have the impression that I am incapable of succeeding in swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
7. *For the pleasure it gives me to know more about swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
8. Because it allows me to be well regarded by people that I know.	1	2	3	4	5	6	7
9. *Because, in my opinion, it is one of the best ways to meet people.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
10. *Because I feel a lot of personal satisfaction while mastering certain skills/techniques.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
11. *Because it is absolutely necessary to do physical activity if one wants to be in shape.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
12. *Because it is one of the best ways I have chosen to develop other aspects of myself.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
13. *For the pleasure I feel while improving some of my weak points.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
14. *For the excitement I feel when I am really involved in swimming.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
15. *Because I must do physical activity to feel good about myself.*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
16. For the satisfaction I experience while I am perfecting my swimming abilities.	1	2	3	4	5	6	7
17. Because it is a good way to learn things which could be useful to me in other areas of my life.	1	2	3	4	5	6	7
18. For the positive emotions that I feel while I am swimming.	1	2	3	4	5	6	7
19. It is not clear to me anymore; I don't really think my place is in swimming.	1	2	3	4	5	6	7

20. For the pleasure that I feel while executing certain difficult skills/ techniques	*1*	*2*	*3*	*4*	*5*	*6*	*7*
21. Because I would feel bad if I was not taking time to swim.	1	2	3	4	5	6	7
22. To show others how good I am at swimming.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
23. For the pleasure that I feel while learning skills/techniques that I never tried before.	1	2	3	4	5	6	7
24. Because it is one of the best ways to maintain good relationships.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
25. Because I like the feeling of being totally immersed in the activity.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
26. Because I must do physical activity regularly.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
27. For the pleasure of learning new skills/techniques.	*1*	*2*	*3*	*4*	*5*	*6*	*7*
28. I often ask myself; I can't seem to achieve the goals that I set for myself in swimming	*1*	*2*	*3*	*4*	*5*	*6*	*7*

6. Background

Age : _____

Gender : Female _____ Male _____

For which club do you swim? _____

Do you compete on a regular basis? Yes _____ No _____

How many times a week do you swim? _____

How many years have you been swimming with this club? _____

We thank you very much for your participation!

IF YOU ARE INTERESTED IN PARTICIPATING IN THE SECOND PART OF THIS STUDY, I.E. INTERVIEWS, PLEASE WRITE YOUR NAME AND TELEPHONE NUMBER.

Name:

Telephone number:

APPENDIX E

ETHICS APPROVAL FORMS

Université d'Ottawa • University of Ottawa

Faculté des sciences de la santé
Cabinet de la doyenne

Faculty of Health Sciences
Office of the Dean

CERTIFICATION OF INSTITUTIONAL HUMAN RESEARCH ETHICS COMMITTEE FACULTY OF HEALTH SCIENCES

This is to certify that the Institutional Human Research Ethics Review Committee of the Faculty of Health Sciences has examined the research proposal by **Professor Michelle Fortier and Student John Kowal**, from the **School of Human Kinetics** for the project entitled: ***"Towards a Hierarchical Motivational Model of Flow"*** and concludes that, in all respects, the proposed research protocol meets the appropriate standards of ethical acceptability, at a **Category 1A** level.

MEMBERS OF THE COMMITTEE

Name (Optional)	Position held	Department of discipline
Victor Boucher	Professor	Audiology and Speech-Pathology Program
François Tremblay	Professor	Physiotherapy Program
Claire-Jehanne Dubouloz	Professor	Occupational Therapy Program
Ann Watters	Student	School of Nursing
Jocelyne Tourigny	Professor	School of Nursing
Julian Roberts	Professor	Department of Criminology
Roch Paquin	Member-at-Large	
J. Roger Proulx	Chair	Human Research Ethics Committee School of Human Kinetics

SIGNATURE

17/09/1996

Date **Committee Chairperson - J. Roger Proulx, Ph.D.**

451, ch. Smyth
Ottawa (Ontario) K1H 8M5 Canada

451 Smyth Rd.
Ottawa, Ontario K1H 8M5 Canada

(613) 562-5432 • Téléc./Fax (613) 562-5437

Université d'Ottawa • University of Ottawa

Faculté des sciences de la santé
Cabinet de la doyenne

Faculty of Health Sciences
Office of the Dean

September 17, 1996

Professor Michelle Fortier
Student John Kowal
School of Human Kinetics
Faculty of Health Sciences
Montpetit Hall
INTRA

Subject: **Your project entitled *"Towards a Hierarchical Motivational Model of Flow"***

Dear Professor:

It is my pleasure to inform you that the Faculty of Health Sciences, Human Research Ethics Committee, after study of the documentation provided, concluded that your project met the appropriate standards of ethical acceptability and falls within **CATEGORY 1A.**

I hereby attach a copy of the certificate of clearance granted by the University Human Research Ethics Committee.

This certificate is valid for a period of one year from the time of issuance. I would also like to remind you that, in accordance with the policies of the UHREC, it is your responsibility to notify the Committee of any major changes in this project.

On behalf of the Committee, I wish you success in your project.

Sincerely,

J. Roger Proulx, Ph.D.
Chair, Human Research Ethics Committee

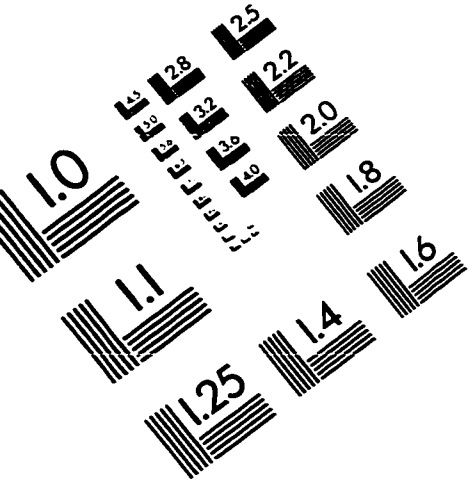
Encl.

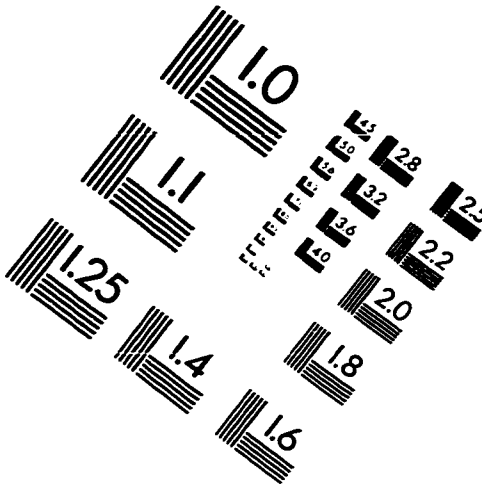
451, ch. Smyth
Ottawa (Ontario) K1H 8M5 Canada

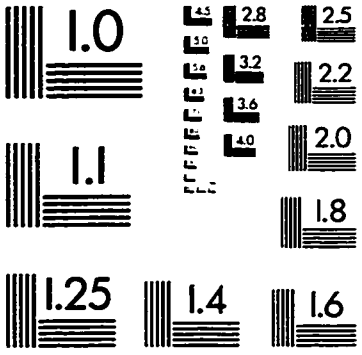
451 Smyth Rd.
Ottawa, Ontario K1H 8M5 Canada

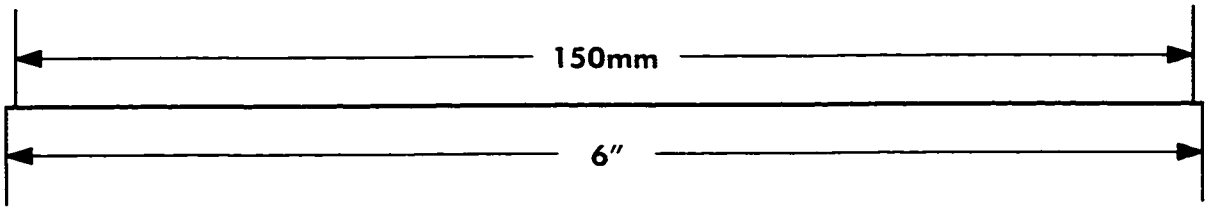
(613) 562-5432 • Téléc./Fax (613) 562-5437

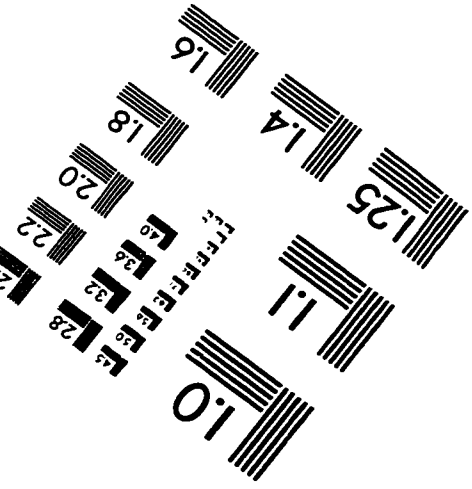
IMAGE EVALUATION TEST TARGET (QA-3)

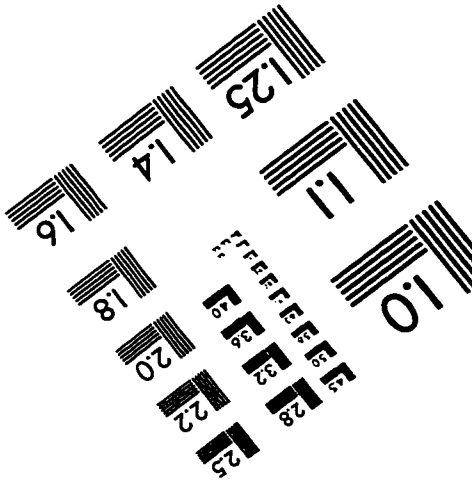












APPLIED IMAGE, Inc
1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989