Developing and Maintaining Optimal Team Functioning in Curling: A Grounded Theory Study with High Performance Coaches and Athletes

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Abstract

Gaps. Building an effective team and optimizing team functioning in sport is an important, albeit complex and challenging endeavour involving several processes (Bloom, Stevens, & Wickwire, 2003; Collins & Durand-Bush, 2010; Yukelson, 1997). Unfortunately, our knowledge of what constitutes optimal team processes, and how these are developed and maintained within specific sports, remains limited. Although several frameworks targeting a few or several group processes have been put forth in the literature, limitations regarding their theoretical foundation, comprehensiveness, and application have been identified. Collins and Durand-Bush (2015a) made a call for grounded theory research in order to provide an in-depth understanding of team processes required for optimal functioning in specific sports. Given that none of the existing frameworks in the literature have been developed using a grounded theory approach, and none have been tailored to meet the needs of particular sports, this type of inductive research is warranted.

Aims. This dissertation had two general aims. The first aim was to critically review theoretical/conceptual frameworks in the literature directly or indirectly addressing team processes in sport and derive implications for professional practice (Article 1). The second aim was to use a grounded theory research approach to investigate (a) factors that contribute to the development and maintenance of optimal team functioning within high performance curling (Article 2), (b) strategies used by high performance coaches and athletes to optimize team functioning (Article 3), and (c) specific roles that curling coaches play in this process (Article 4).

Methods. To address the first aim, a critical review of frameworks targeting team processes that were used to guide research and/or practice in sport was performed by first identifying frameworks by searching electronic databases, then doing a content analysis to

identify specific team processes that were explicitly reported or could be implicitly inferred based on the literature, conducting a second level of analysis to extract broader team processes, followed by a third level of analysis to identify general themes, and finally comparing specific team processes, broader team processes, and general themes.

To address the second aim, a constructivist grounded theory approach (Charmaz, 2006) was used to collect data from 19 high performance curling teams (N = 78 athletes and N = 10 coaches). Of these, seven were men's teams, 12 were women's teams, and the 10 coaches were men. Overall, data collection and analysis involved eight steps: (a) conducting interviews (face-to-face focus group interviews with teams of athletes and individual telephone interviews with coaches), (b) transcribing the data (c) reflecting and writing memos, (d) coding the data, (e) performing multiple coder checks, (f) verifying and re-coding the data, (g) developing the grounded theory model, and (h) verifying the model.

Results. As indicated in ***Article 1***, seven frameworks used to guide research and/or practice in sport were identified. Three frameworks were borrowed from general psychology while the other four stemmed from the sport psychology literature. On average, the frameworks targeted five general themes (e.g., roles/norms, personal characteristics), six broader team processes (e.g., establish roles, identify team characteristics,) and the outcome of cohesion. The general theme pertaining to roles/norms was the most prevalent one as it was addressed in six out of the seven frameworks. One of the least prevalent general themes related to goals; it was only discussed in two of the seven frameworks. Results show that all of the frameworks were developed using a deductive approach.

Article 2 shows that developing and maintaining optimal team functioning in high performance curling is a dynamic process involving numerous factors that influence each other. The Optimal Team Functioning (OTF) model was inductively created to outline key

attributes (N=4) and processes (N=17) deemed necessary by high performance curling coaches and athletes for optimal functioning within different contexts. The model comprises eight components under which attributes and processes are grouped: (a) Individual Attributes, (b) Team Attributes, (c) Foundational Process of Communication, (d) Structural Team Processes, (e) Individual Regulation Processes, (f) Team Regulation Processes, (g) Context, and (h) Desired Outcomes. The OTF model is unique because it is comprehensive, sport-specific, inductively derived, and applicable with a strong focus on actions.

As seen in ***Article 3***, coaches and athletes reported using many strategies to develop and sustain optimal team functioning. A total of 155 strategies were linked to the eight aforementioned components of the OTF model, which can be targeted when working with teams. Both individual (e.g., journal, apologize for mistakes, do self-assessments) and team strategies (e.g., establish a decision-making process, establish a support team, discuss leadership behaviours) were identified, some of which served multiple purposes (e.g., create a player contract). Unique to the present study was the importance of individual regulation strategies, suggesting that team building interventions should focus on both the team itself and individual members. Communication was involved in most of the strategies, thus methods aimed at enhancing communication within teams should be prioritized.

Finally, ***Article 4*** demonstrates that coaches played five major roles in optimizing team functioning: technical/tactical specialist, mediator, facilitator, manager, and motivator. Both coaches and athletes saw value in each of these roles, however, they did not necessarily perceive the importance and characteristics of these roles the same way. Perceptions were dependent on athletes' needs as well as both coaches and athletes' personal characteristics and competencies. In order for coaches to effectively help teams optimize functioning and achieve desired outcomes, specific training should be provided as both coaches and athletes

reported that skills and attributes to successfully perform roles were sometimes lacking.

Keywords: optimal team functioning, team building, team dynamics, high performance, athletes, coaches, sport, roles, curling, grounded theory

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PART I

Introduction and Literature Review

A commonly referenced phenomenon in the sport literature is one in which a team comprised of a number of talented athletes is unable to successfully perform while another team with lesser talent is able to exceed expectations. This phenomenon is largely a result of team processes. Many researchers have recognized the importance of team processes (e.g., communication, interaction) for team functioning and performance (e.g., Beauchamp, Maclachlan, & Lothian, 2005; Carron, Hausenblas, & Eys, 2005; Collins & Durand-Bush, 2010; McEwan & Beauchamp, 2014; Prapavessis, Carron, & Spink, 1996; Yukelson, 1997). The responsibility of optimizing these essential team processes often falls on the coach (Bloom et al., 2003; Collins & Durand-Bush, 2010; Silva, 1984). Given their immersion in nearly all aspects of team functioning, coaches are in an ideal position to play this role (Bloom et al., 2003; Collins & Durand-Bush, 2010; Lyle, 2002).

The Coaching Process

Given the focus of the current research on the work that coaches do to optimize team functioning, it is necessary to review the current status of the coaching literature. Particularly, it is important to outline how the coaching process is operationalized so that coaching behaviours pertaining to team functioning can be situated within it.

According to Cushion and Lyle (2010), it is only in the last 10 to 15 years that scholars have begun to view coaching as a process, and consequently, research has "spawned a search for the most appropriate means to represent and understand it" (p. 8). Coaching has been described as being full of uncertainty, ambiguity, and complexity (Bowes & Jones, 2006; Côté, Salmela, Trudel, Baria, & Russell, 1995; Jones & Wallace, 2005; Lyle, 2002; Saury & Durand, 1998). Currently, an accepted definition of sport coaching is that proposed

by Lyle (2002) whereby coaching is postulated to be a continuous and dynamic process representing an "agreement between athlete and coach… [which] consists of the purposeful, direct and indirect, formal and informal series of activities and interventions designed to improve competition performance" (p. 40). Thus, coaching is conceptualized as being a dynamic, multifaceted, and complex process (Cushion, Armour, & Jones, 2006).

The coaching model. To date, a number of frameworks have attempted to model the coaching process (Lyle, 2002). However, only one framework, The Coaching Model (CM; Côté et al., 1995), has been empirically developed using a grounded theory approach and has received some empirical support (Bloom, 2011; Horn, 2008). This framework is among the most widely used in the coaching science literature, particularly when examining expert Canadian coaches (Bloom, 2011). Of relevance to the present study is the CM's view into the different areas in which coaches exert influence, that is, training, competition, and organization (Côté et al., 1995).

Developed from interviews with 17 high performance gymnastics coaches, the purpose of the CM is to identify "...how expert coaches [work] towards their objectives of developing elite gymnasts by building mental models" (Côté et al., 1995, p. 12). The CM suggests that coaches form a 'mental model' of their athletes' potential based on three peripheral factors: coaches' personal characteristics (e.g., knowledge, philosophy, personal life), athletes' characteristics (e.g., physical and mental characteristics, personal and social demands), and contextual factors (e.g., financial and training resources, competitive environment). This mental model is then executed in the areas of competition, training, and organization in order to reach the goal of developing athletes (Côté et al., 1995). In summary, the CM proposes that coaching effectiveness is determined by numerous cognitive,

interpersonal, and operational factors and not merely coaches' personality traits and organizational behaviours (Bloom, 2011).

Coaching within team sport contexts. With regards to what is known about the coaching process as it relates to team sport contexts, studies have demonstrated the importance of coaching behaviours such as developing rapport with athletes, goal-setting, planning, and evaluation (Côté et al., 1995; Côté & Salmela, 1996; Côté & Sedgwick, 2003; Gilbert & Trudel, 2000). However, studies focusing on coaches of team sport athletes are less abundant than those targeting individual sport coaches. Lyle (2002) highlighted the need to further explore coaching as it relates to team sports as in these conditions, the coaching process is even more complex; individualisation and performance evaluation become a challenge, and player turnover hinders continuity. Additionally, team sport coaches must prioritize coach-athlete relationships as well as interpersonal processes in order to maximize performance (Carron et al., 2005; Jones, Bowes, & Kingston, 2010; Jowett & Wylleman, 2006).

Most coaching behaviours studied in team sport contexts have focused on three categories: instruction, praise/scold, and silence (Cushion, 2010). In fact, Cushion (2010) noted, "these behaviours account for approximately 80% of what research has identified that coaches do" (p. 46). However, by focusing research on these observable behaviours, scholars have limited our understanding of the many ways that coaches exert influence in different sport situations and contexts in order help their teams function on a daily basis. As found by Côté and colleagues' (1995), these behaviours only account for a fraction of coaches' behaviours and roles.

Lyle (2002) suggested that for a number of reasons, team sport coaching can be a challenge. Thus, although validated in the context of ice hockey (Gilbert & Trudel, 2000),

and used to explore the personal characteristics of team sport coaches (Bloom & Salmela, 2000), the aforementioned CM's (Côté et al., 1995) applicability to team sport coaching is arguably limited given its original development with elite gymnastics coaches. In fact, results of Côté and colleagues' study provided little insight into the dynamic, social processes (Lyle, 2002) believed to characterize team sport coaching. Lyle and Cushion (2010) proposed that a more comprehensive understanding of the application of mental models (e.g., how they influence team processes such as communication) might be the key to understanding the coaching process.

In the particular team sport context of curling, high performance athletes have acknowledged the importance of group processes to excel. For example, John Morris, an Olympic curling champion, spoke of his team's success:

> What most people didn't understand was the amount of thought we put into team dynamics. Sure, we knew the four of us had the talent to make a lot of shots. But like most of the best rinks on Tour, we carefully considered the individual personalities and what each would inject. We also had frank discussions about how we would operate on and off the ice (Morris & Gemmell, 2009, p. 59-60).

It seems plausible that in the context of curling in which teams are only typically comprised of four athletes, both coaches and athletes must pay considerable attention to interpersonal team processes. This was evident in the study by Collins and Durand-Bush (2010) who found that team processes were a major focus of an elite curling coach's interventions throughout his team's competitive season. As noted by Lyle (2002) and Gilbert and Trudel (2004), "although elements of the coaching process (e.g., training, competition, organization) may be generic across sports, the type of sport brings unique challenges and requires different coaching strategies" (p. 397). Even if there are often a number of similarities between high

performance athletes, “at the same time, every athlete has an individual personality, that demands an individual approach, communication skills and specific interventions” (Trninić, Papić, & Trninić, 2009, p. 101) on the part of the coach. Given the small team size and the unique role that coaches play at a high level in the sport of curling (e.g., can vary from full to partial involvement), this context is an interesting one in which to examine how coaches help athletes develop and sustain optimal team functioning.

Group Dynamics, Cohesion, and Team Processes

Since the current research focuses on team functioning, relevant literature pertaining to group dynamics, cohesion, and team processes will be reviewed.

Definitions of terms. Group dynamics refers to “the influential actions, processes, and changes within and between groups over time” (Forsyth, 2010, p. 2) or the “energy, vitality, and growth and development” that is characteristic of groups (Carron et al., 2005, p. 14). To date, the vast majority of group dynamics research in sport has pertained to the concept of team cohesion, as well as team building. Team cohesion is defined as a “dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs” (Carron et al., 1998, p. 213). Team building, on the other hand, refers to “a method of helping the group to a) increase effectiveness, b) satisfy the needs of its members, or c) improve work conditions” (Brawley & Paskevich, 1997, p. 13). According to the Team Building Model (Carron & Spink, 1993; Prapavessis, Carron, & Spink, 1996), which highlights factors influencing cohesion, cohesion is the output (or product) of input and throughput factors: there are two input factors, which are the team environment (e.g., proximity and distinctiveness) and team structure (e.g., team norms, roles, and leadership). These input

factors affect the throughput of team processes (e.g., interaction, communication, sacrifices), which in turn are expected to directly impact the level of team cohesion.

Highlighted in both Forsyth's (2010) definition of group dynamics and Prapavessis and colleagues' (1996) team building model is the importance of team *processes*, which refer to "acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward... [achieving] collective goals" (Marks, Mathieu, & Zaccaro, 2001, p. 357). In other words, it may be suggested that team processes involve multiple actions that assist teams in converting initial resources into shared performances. In the context of sport, these processes typically include communication, interaction, cooperation, and team goal setting (Carron et al., 2005). However, little is known about how these team processes are developed and sustained by coaches and athletes (Brawley, 1990). Consequently, there is a need to explore processes that contribute to positive outcomes such as optimal team functioning, performance, and cohesion (Brawley, 1990; Jowett & Wylleman, 2006; Loughead & Hardy, 2006; Pain & Harwood, 2009).

Group dynamics models/frameworks. To date, a number of group dynamics models or theoretical frameworks have been used in the context of sport and exercise. For example, early researchers borrowed frameworks from organizational and industrial psychology in response to the absence of frameworks developed and validated for use in sport. Prominent frameworks include Tuckman's (1965; Tuckman & Jensen, 1977) theory of group development and Steiner's (1972) theory of group productivity. More recently, scholars have developed and validated models for specific use in the context of sport and exercise, such as Carron's (1982) correlates of cohesion, the conceptual model of cohesion (Carron et al., 1985), and Prapavessis and colleagues' (1996) team building model. Others still have adapted early psychological frameworks to be more specific to sport, such as the social-cognitive

framework of coordination and communication in sport put forth by Eccles and Tenenbaum (2004), and the personality-based preference framework for team communication (Beauchamp et al., 2005). That said, these frameworks have been criticized for a number of reasons. First, these frameworks, as well as the research resulting from them, have focused predominantly on team cohesion and neglected other crucial elements of group dynamics, particularly team processes (Brawley, 1990; Loughead & Hardy, 2006). Consequently, aside from Prapavessis and colleagues' model, they provide little insight into the mechanisms contributing to optimal team functioning (Carron, 1982; Tuckman, 1965; Tuckman & Jensen, 1977). Secondly, these frameworks are largely atheoretical or have been derived using a deductive (i.e., top-down) approach based on findings in the literature, thus the resulting research has been criticized for being "highly fragmented without theory to systematically guide the collection and interpretation of data" (Brawley, 1990, p. 368). An example of this can be seen in Carron and colleagues' (2005) text wherein four chapters are devoted to team processes without any mention of theoretical or conceptual frameworks used to examine them in sport.

Given the impact of group dynamics on team sport members and performance, it would appear to be important to develop an empirical framework addressing the intricate mechanisms that could help coaches and athletes to maximize their ability to develop and sustain optimal team functioning. As previously mentioned, aside from the construct of cohesion, very little attention has been paid to *how* to optimize team processes in sport, particularly with regards to strategies and techniques employed to facilitate this optimization (Brawley, 1990; Ryska, Yin, Cooley, & Ginn, 1999; Turman, 2003). One area of research that may shed light on this is that of team building, a method designed to improve team functioning and ultimately enhance member satisfaction and performance. It should be noted,

however, that "sport-related team building literature is in its infancy" (Loughead & Hardy, 2006, p. 273).

Team building. Sport psychology consultants or coaches can facilitate team building interventions, in which strategies are used to optimize the group environment, the team's structure, as well as team processes (Loughead & Hardy, 2006). To date, team building interventions have integrated strategies to target various aspects such as roles, intra-team communication and team goal-setting (e.g., Bloom & Stevens, 2002; Newin, Bloom, & Loughead, 2008; Pain & Harwood, 2009; Senécal, Loughead, & Bloom, 2008; Voight & Callaghan, 2001). Overall, team building intervention studies have been influential in that they have successfully fostered enhanced cohesion and team effectiveness; nonetheless, their contribution to practice has been limited for a number of reasons. A primary limitation is that most interventions have relied predominantly on 'snap-shot' activities that provide little insight into how teams respond to challenges characterizing day-to-day interactions (Collins & Durand-Bush, 2010; Stevens & Bloom, 2003). Secondly, interventions were often standardized and thus not tailored to the specific needs of each team and did not consider the input of coaches (e.g., Bloom & Stevens, 2002; Newin et al., 2008; Pain & Harwood, 2009; Senécal et al., 2008). Lastly, a third limitation of many team building studies is that little information pertaining to specific strategies and techniques that practitioners and/or coaches utilized were provided (i.e., *how* the intervention was facilitated on a daily basis). As a result, the everyday processes through which team sport members develop and nurture optimal team functioning remain unclear (Collins & Durand-Bush, 2010; Jowett & Wylleman, 2006).

Team processes. A few studies, however, have shed light on team processes, including the impact that coaching behaviours have on team processes and functioning. For example, Ryska and colleagues (1999) found that coaches use a number of strategies related

to athlete integration (e.g., praise team cooperation and effort despite defeat, get to know each athlete personally) and role development (e.g., set team goals, promote frequent and open communication) in efforts to foster cohesion. A limitation, nonetheless, was that the research design did not allow for the emergence of novel strategies – participants merely responded to a 14-item questionnaire developed by the researchers after examining the applied sport psychology and group dynamics literature.

In contrast, Collins and Durand-Bush (2010, 2014) conducted a single case study in which they documented a season-long intervention in which an elite curling coach and his team of four female athletes attempted to learn self-regulation strategies to enhance performance and cohesion. The study highlighted how the coach made great efforts to help his athletes enrich team processes such as communication and support and how developing optimal team processes is a lengthy, challenging practice that requires attention, particularly on the part of the coach. That said, the coach relied on a number of strategies to help his team work together and function more effectively. Examples of these strategies included leading them to anticipate and prepare for obstacles, encouraging them to accept responsibility for the outcome of their performances, and teaching them how to adapt to one another and respect individual differences.

Team goal setting is another important process in team sports (Carron et al., 2005) that contributes to enhanced performance (Brawley, Carron, & Widmeyer, 1993), task and social cohesion (Brawley et al., 1993; Senécal et al., 2008), motivation (Carron et al., 2005) and member satisfaction (Brawley et al., 1993). Carron and Coleman (2000) proposed a team goal-setting procedure consisting of three stages: (1) provide a rationale for the creation of team goals, (2) monitor progress towards team goals, and (3) evaluate team goals. The authors noted that during the monitoring and evaluation of progress, coaches play a vital role

and without their active involvement, the goal setting procedure would be unsuccessful (Loughead & Hardy, 2006).

An additional vital process for optimal team functioning, especially in the context of interactive sports, is communication (Sullivan, 1993). Williams and Widmeyer (1991) were the first to suggest that communication mediates the cohesion-performance relationship; this relationship between communication and both task and social cohesion has since been confirmed (Sullivan & Feltz, 2003). That said, little is known about what constitutes effective communication. Slepica (1975, as cited by Sullivan, 1993) postulated that communication must be friendly and sympathetic, whereas others advocate for communication that is assertive, to the point, and respectful (Connelly & Rotella, 1991). According to Sullivan and Feltz (2003), coaches can learn to optimize their ability to communicate by using both verbal and non-verbal skills. Within both the coaching and group dynamics literature, the focus of communication research has been on coach-athlete communication, and techniques and strategies utilized by coaches to promote effective communication within the larger context of the team have gone largely unexamined.

According to Yukelson (1984, 2006), trust, disclosure, and mutual respect are pre-requisites for effective coach-athlete communication. Some studies have explored the effects of team interventions involving personal disclosure and mutual sharing of experiences (Collins & Durand-Bush, 2010; Dunn & Holt, 2004; Pain & Harwood, 2009). Although coaches were not involved in Dunn and Holt's (2004) study, both Collins and Durand-Bush (2010) and Pain and Harwood (2009) noted the vital role that coaches played in the intervention, which comprised regular team meetings between coaches and athletes in which task and social aspects of the sport were addressed and led to enhanced perceptions of performance and cohesion. Congruent with these findings, studies have built on the notion

that “an expert team is more than a team of experts” (Eccles & Tenenbaum, 2004, p. 542), and suggested that when teams are able to function effectively, it is a result of effective group communication and coordination, which is achieved through the development of shared knowledge and experience (Bourbousson, Poizat, Saury, & Seve, 2010; Eccles & Johnson, 2009; Eccles & Tenenbaum, 2004; Steiner, 1972).

While the aforementioned studies begin to shed some light on what coaches do in order to optimize team functioning, the strategies that athletes use on a day-to-day basis to effectively work with teammates have not been particularly investigated. This is surprising given that two recent studies in high performance curling demonstrated that at times, interacting with teammates is challenging and requires a great deal of conscious effort (Collins & Durand-Bush, 2010; Tamminen & Crocker, 2013). One athlete described the challenge and importance of teamwork:

> I think we all need to re-group if ever we separate....When we’re together, we’re happier even if we’re losing and it makes it easier to come back. Whereas if we’re not talking or communicating, we might as well just shake. I get really mad on the ice [too], and it’s so hard to re-group....But it seems like being a team is more important....it seems like things are showing that when we get down, we don’t win games. So it would be better if we could try to fix that. (Collins & Durand-Bush, 2010, p. 355)

Consequently, in addition to exploring the role of the coach in developing high functioning teams, it seems equally necessary to explore what athletes do to effectively work together.

In summary, it has been well documented that coaching is a challenging and complicated process, particularly with regards to coaching in a team sport context (Lyle, 2002). Coaches must continuously adapt to the diverse personalities, experience, talent, and

ability on sport teams (Mack & Gammage, 1998) to facilitate effective functioning and performance. Similarly, one can argue that athletes must also be able to effectively adapt to their teammates and coaches. Unfortunately, research in the area of team functioning has been largely atheoretical (Brawley, 1990). Existing frameworks are not comprehensive and have been typically developed using a deductive approach based on the available literature, which limits our knowledge of what constitutes optimal team processes (e.g., communication, interaction, cooperation, and goal-setting), and how these are developed and maintained by both coaches and athletes. Although the literature on team building has generated some understanding, few applicable strategies have been put forth in the literature to guide practice in this area. It is thus important to inductively rather than deductively develop a comprehensive theoretical framework based on the real life experiences and perceptions of coaches and athletes to guide their efforts in nurturing optimal team functioning in their sport. It is equally important to uncover concrete strategies that coaches and athletes can use to effectively function as these are lacking in the literature. Given the ideal position of coaches to help athletes enrich team processes, the specific roles that coaches perform when building their teams should be examined.

Purpose of the Study

Given the aforementioned gaps, there were two general aims to this research. The first aim was to critically review theoretical/conceptual frameworks in the literature directly or indirectly addressing team processes in sport and derive implications for professional practice. This was deemed necessary to first get a thorough understanding of the landscape of team processes addressed in existing frameworks and to clearly situate and justify the second aim of the research (Research question - What frameworks addressing team processes have been used to guide research and practice in sport and how do they inform practice? see

Article 1). Based on the numerous gaps identified in Article 1, the second aim of the research was to use an inductive grounded theory research approach to investigate:

- Factors that contribute to the development and maintenance of optimal team functioning within high performance curling (Research question - What factors contribute to the development and maintenance of optimal team functioning within high performance curling teams?), the outcome of which was the creation of a comprehensive grounded theory model of optimal team functioning (see Article 2);
- Strategies used by high performance coaches and athletes to optimize team functioning (Research question - What strategies do coaches and athletes use to develop and maintain optimal team functioning in the context of high performance curling? see Article 3);
- Specific roles that curling coaches play in this process (Research question - What roles do coaches play in developing and maintaining optimal team functioning in the context of high performance curling? see Article 4).

PART II

Methodology

Methodological coherence served as a guiding principle in this research. It refers to correspondence between all aspects of a study, from the guiding paradigm and research questions through to the final product (Holt & Tamminen, 2010b; Mayan, 2009). The following section will outline how methodological coherence was achieved, that is, the chosen paradigm and corresponding methodological approach will first be described. Research participants and data collection and analysis procedures will then be outlined, followed by methods to ensure trustworthiness.

Research Paradigm: Constructivism

This doctoral research was conducted from a constructivist standpoint, underscoring that the notion of a single reality is negated. Instead, it is postulated that realities can take on multiple forms; they are "intangible mental constructions, socially and experientially based, local and specific in nature…" (Guba & Lincoln, 1994, p. 110). Consequently, it was assumed that participants' experiences in team sport contexts would be "shaped by the conventions of language and other social processes" (Crotty, 1998, p. 58).

By adopting a constructivist view, the researcher engaged participants as active agents in constructing their own reality. However, constructivists also acknowledge that the researcher influences their perceptions of reality and thus the realities of the researcher and each participant are inextricably linked (Guba & Lincoln, 1994). As a result, the findings of this dissertation reflect a co-constructed process (Nguyen & Otis, 2003). The researcher's relationships with participants, the questions posed during the data collection process, and the researcher's interpretation of the data undoubtedly shaped the grounded theoretical framework of team functioning that emerged.

Research Methodology: Grounded Theory

In line with the paradigm guiding this research, a constructivist grounded theory approach (Charmaz, 2006) was employed to carry it out. According to Bryant and Charmaz (2007), grounded theory is the most frequently cited method in social science research, however, only over the last decade has it received limited use in the field of sport and exercise psychology (Holt & Tamminen, 2010a). Grounded theory refers to a 'bottom-up' approach to the discovery of theory (Urquhart, 2001) in that theory is not pre-determined but rather is 'grounded' in data systematically collected from participants who have experienced the process, action, or interaction under study (Creswell, 2007; Lingard, Albert, & Levinson, 2008; Strauss & Corbin, 1998).

According to Creswell (2007), grounded theory is a suitable methodology when no existing theory is able to suitably explain a process of interest. For example, it is acknowledged that there is a plethora of research in the field of team dynamics (Carron et al., 2005; Forsyth, 2010), however, existing frameworks are mostly atheoretical and incomplete as they fail to account for how coaches and athletes develop and maintain team processes (e.g., communication, interaction) that facilitate the effective functioning of sport teams. Furthermore, grounded theory can be beneficial when the "research questions that the inquirer asks of participants will focus on understanding how individuals experience the process and identifying the steps in the process" (Creswell, 2007, p. 66). This was an important focus in the present research.

Recently, researchers have begun to consider grounded theory as a 'family of methods', with each variant encompassing numerous similarities, differences, and idiosyncrasies (Bryant & Charmaz, 2007). In a recent review of grounded theory research in sport and exercise psychology, Holt and Tamminen (2010a) identified eight core

characteristics of grounded theory studies that were relevant in the current research. The authors stated that a limitation of the current research in the field of sport and exercise psychology has been the variable degree to which researchers implemented these key characteristics. Each of these will be discussed in the ensuing sections as they are applicable to the specific variant of grounded theory chosen for this research, that is, Charmaz's (2006) constructivist grounded theory.

There are a number of idiosyncrasies between the 'evolved' approaches to grounded theory, such as Charmaz's constructivist grounded theory, and the more traditional, post-positivistic approaches (Mills, Bonner, & Francis, 2006b); these differences stem largely from their opposing worldviews. As noted by a number of scholars, attractive elements of Charmaz's (2006) constructivist grounded theory relate to the role of the researcher, the flexibility and adaptability of the approach, and the reliance on researcher reflexivity (Creswell, 2007; Mills, Bonner, & Francis, 2006a). For example, traditional grounded theory was considered "silently authored" (Mills et al., 2006b, p. 7) with the researcher acting merely as a "distant expert" (Charmaz, 2000, p. 513); theory was believed to emerge from the data without influence from the researcher. Conversely, Charmaz (2006) suggests that the theory is not discovered but rather is created through the interaction between the participants, the researcher, and the social world.

Because theory is 'created' as opposed to 'discovered', Charmaz (2006) proposes that grounded theory methods should not reflect a set of "prescriptions or packages" (p. 9) but rather flexible parameters or recommendations to guide the research process - the rationale being that, "even the most regimented process may contain surprises because the present arises from the past but is never quite the same" (Charmaz, 2006, p. 10). Consequently, reflexivity plays a crucial role in the research process as it allows researchers to reflect on

"…his or her research experience, decisions and interpretations in ways that bring the researcher into the process and allow the reader to assess how and to what extent the researcher's interest, position and assumptions influenced inquiry" (Charmaz, 2006, p. 188; Moon, 2008).

Participants

Participants in this research were members of 19 high performance curling teams (N = 78 athletes and 10 coaches). High performance, as defined by Curling Canada (CC, 2014) is "a national level participant or someone who has potential to participate at the level in the sport of curling". Both male (N=7) and female (N=12) teams were recruited for participation. Some teams did not have a coach when data collection took place (e.g., if interviewed early in the season), and other coaches were unavailable for participation; all ten coaches happened to be men.

The sport of curling was chosen based on its interactive nature (Grieve, Whelan, & Meyers, 2000) as well as for its small team size (Turman, 2003), which was particularly important, as it was believed that there would be considerable opportunities for coaches and athletes to interact, and the limited number of athletes would lend itself well to the focus group interviews. Moreover, the sport of curling is an underexplored context; Gilbert and Trudel (2004) noted in their published review of the coaching literature that curling was identified in less than 5% of research articles.

Theoretical sampling was used to recruit the sample through the High Performance Director of CC. Theoretical sampling refers to "seeking and collecting pertinent data to elaborate and refine categories in your emerging theory" (Charmaz, 2006, p. 96), and helps to achieve theoretical saturation. Teams were sampled based on gender, years of experience, duration of team existence, and current team ranking based on the Canadian Team Ranking

System (CTRS). A recruitment email (Appendix A) outlining the research objectives, the participation requirements, as well as the rights of all participants was sent to Mr. Peckham, who forwarded the email to high performance teams within the CC organization who met the sampling criteria. All interested teams followed up to schedule an interview. Because of the iterative process and ongoing theoretical sampling, the recruitment process took place over two competitive seasons.

Data Collection and Analysis

Eight steps were involved in the data collection and analysis process (Charmaz, 2006). Each of these steps can also be linked to Holt and Tamminen's (2010a) core characteristics of grounded theory studies. The steps included: (1) interviewing (2) data transcription, (3) researcher reflexivity and memo-writing, (4) data coding, (5) multiple coder checking, (6) verification and re-coding of data, (7) model development, and (8) model verification. These characteristics capture "the essence of most variants of [grounded theory] methodology" (Holt & Tamminen, 2010, p. 407). Each of the characteristics, as they pertain to the present research and the constructivist variant of grounded theory will be discussed in the ensuing sections.

It must be noted that the data collection and analysis process was iterative and dynamic and was not conducted in a linear fashion. There was interplay between the theoretical sampling of participants, data collection, and data analysis. For example, the researcher conducted focus group interviews, engaged in brief memo-writing, and transcribed data, after which she conducted more interviews with further memo writing and data transcription, and so on.

Interviews. The data were collected via: (a) face-to-face focus group interviews with teams of athletes, and (b) individual telephone interviews with coaches. Because the research

questions targeted team processes, focus group interviews with existing teams were considered the ideal way to allow the athletes, who had common interests and goals, to interact and discuss amongst each other while responding to questions (Creswell, 2007). As Gibbs (1997) noted, often, "attitudes, feelings, and beliefs may be partially independent of a group or its social setting, but are more likely to be revealed via the social gathering and the interaction which being in a focus group entails." As a result, the researcher felt that by interacting and talking about assorted topics (e.g., an obstacle that the team encountered), athletes would be able to share their perspectives, respectfully challenge one another, and "re-evaluate and reconsider their own understandings of their specific experiences" (Gibbs, 1997). This type of process contributes to multiple perceptions and explanations (Gibbs, 1997), and thus rich and comprehensive data.

The coaches were excluded from the focus group interviews. It was believed that athletes would feel more comfortable disclosing information pertaining to the strategies used and roles performed by coaches to develop and maintain optimal team functioning, without fear of repercussions. Krueger and Casey (2009) suggested that in order for focus groups to be fruitful, the setting must be conducive to open and honest answers. Therefore, individual telephone interviews were conducted separately with each coach to obtain their perceptions. All focus group interviews took place at training camps or competitive events, with the exception of one, which was conducted locally.

Face-to-face focus group interviews with teams of athletes. According to Stewart, Shamdasani, and Rook (2007), focus group research first originated from the field of group dynamics and has since received support for its ability to "[act] like a magnifying glass" and "capitalize on the richness and complexity of group dynamics" (Kamberelis & Dimitriadis, 2005, p. 903). Consequently, in order to collect data pertaining to team processes in curling,

athletes participated in a focus group interview with their respective team, which lasted on average 65 minutes. Accordingly, each focus group interview consisted of the four or five athletes that made up each team (i.e., skip, third or vice-skip, second, lead, and sometimes an alternate). Although focus groups typically consist of 6 to 12 participants, Krueger (1994) argued that 'mini' focus groups are appropriate when "participants have specialized knowledge and/or experiences to discuss in the group" (as cited in Onquegbuzie, Dickinson, Leech, & Zoran, 2009, p. 3).

The focus group interviews were semi-structured in nature, thus an interview guide comprising 12 broad open-ended questions with corresponding codes was used (see Appendix B). The interview format followed Krueger and Casey's (2009) guidelines. Specifically, opening, introductory, transition, key, and ending questions were posed. Sample questions included: Can you please tell me your name, how long you have been competing, both in general and on this team (opening)? What do 'team functioning' or 'team processes' mean to you (introductory)? Can you describe the nature of team processes within your team (transition)? What contributes to the development and maintenance of optimal team functioning within your team (key)? Can you provide some specific examples of strategies that you and your coach use to facilitate team functioning, particularly in response to challenges, setbacks, or obstacles (key)? If you were to give advice to high performance coaches on how to optimize team functioning in curling, what advice would you give (ending; see Appendix B)? The interview questions were consistent with a constructivist perspective as they focused primarily on "eliciting the participant's definitions of terms, situations, and events and try to tap his or her assumptions, implicit meanings, and tacit rules" (Charmaz, 2006, p. 32); the questions were also clear yet still open enough to allow unexpected data to surface (Charmaz, 2006).

During the focus group interview, the researcher alternated between adopting a passive style, which Kitzinger (1995) refers to as 'structured eavesdropping', and a more interventionist style. When adopting an interventionist style, the researcher probed participants for clarification or further details and/or encouraged participants to discuss inconsistencies in their own thinking, as well as incongruences with the perspectives of others (Kitzinger, 1995). According to Krueger and Casey (2009), the opportunity to build upon the ideas of other participants is what contributes to rich data: "As participants answer questions, their responses spark ideas from other participants. Comments provide mental cues that trigger memories or thoughts of other participants – cues that help explore the range of perceptions" (p. 35). The focus group interviews conducted in this research were perceived to be an ideal method not only for this reason, but also to ensure that theoretical saturation was achieved. As noted by Creswell (2007), when developing a grounded theory or model, 20 to 30 individual interviews are typically required before saturation is reached. In this research, 29 interviews were conducted, 19 of which involved 78 athletes and 10 of which involved coaches. By exploring both the common and unique experiences of athletes and coaches, the researcher was able to collect a large amount of data from a considerable number of participants, which facilitated theoretical saturation.

Procedures for the athletes participating in the focus group interviews involved four parts. First, the researcher explained the study and each athlete was given two copies of the consent form (Appendix C) – one they signed and returned to the researcher and another they kept for their records. Next, the athletes completed a brief demographic questionnaire (Appendix D) in which they answered a number of questions pertaining to their experience, the number of years they had been with the team, and the level of involvement of their coach. Following this, the researcher facilitated a group discussion based on the interview guide and

finally, the athletes completed an exit questionnaire (Appendix E), the purpose of which was to determine their level of agreement with what was discussed during the focus group interview. The exit questionnaire also provided athletes with an opportunity to share anything else with the researcher, in confidentiality, that they did not feel comfortable sharing during the focus group interview.

Individual telephone interviews with coaches. After conducting the focus group interview with a particular team, the researcher emailed the coach to ask him to participate in an individual telephone interview. This was done because time constraints limited opportunities to conduct interviews at competitions or training camps; given the challenge of regrouping four or five athletes at the same time and place, focus group interviews were prioritized at those events. Secondly, perceptions and experiences elicited during the focus group interview conducted with a particular team influenced the questions and probes explored with the coach of that team.

An open-ended, semi-structured telephone interview was conducted using a similar interview guide (see Appendix F) with each high performance curling coach who accepted to participate. Each interview lasted approximately 85 minutes and was audio recorded for subsequent analysis. Questions resembled those asked of the athletes during the focus group interviews, however, a greater emphasis was placed on the roles that the coaches played in optimizing their team's functioning. Sample questions included: Can you describe the nature of team processes on your team? What role do you play in optimizing team functioning on the team? How do you help or hinder the athletes' ability to work and interact effectively with one another? Can you provide specific examples of strategies that you use to facilitate team functioning, particularly in response to challenges, setbacks, or obstacles?

Prior to the interview, coaches were emailed a copy of the consent form (Appendix G) and demographic questionnaire (Appendix H), which they signed and returned to the researcher electronically. Coaches were not asked to complete an exit questionnaire as unlike during the focus group interviews, there was no one else present who might influence what they shared.

It is noteworthy that prior to starting the interview, several steps were taken in order to prepare. First, the High Performance Director of CC suggested that the researcher attend a competition to get familiarized with the curling context and meet some of the high performance coaches and athletes. At this competition, the researcher had the opportunity to discuss aspects of the research with coaches, including theoretical sampling criteria. Second, the High Performance Director and a National Coach reviewed the interview guides prior to data collection and provided feedback. Some minor changes were made to clarify a few questions. Finally, the researcher conducted a 75-minute pilot focus group interview prior to the start of data collection with a local competitive women's curling team. The purpose was to go through the interview guide and get the participants' feedback on the clarity of questions, the length and flow of the interview, and the comprehensiveness of the interview guide. The pilot interview also provided the researcher with an opportunity to practice facilitating focus group interviews, as this can be a challenging task requiring intent listening, openness, and researcher flexibility (Gibbs, 1997). The research supervisor who was present and took notes during this interview debriefed it with the researcher immediately after completion. Although she made a few suggestions to increase the flow of the discussion and further probe for examples of team processes, she was pleased with the researcher's facilitation and felt that she was ready to proceed with data collection. A second pilot interview was also conducted with the team's coach.

Data transcription. Each of the 29 interviews were transcribed verbatim. All data that could identify participants were removed from the transcript (e.g., outcome of a major championship) and each participant was identified in the transcript using an ID number. Men's teams were identified with an M, and women's teams with a W. Each team was also assigned a number so that intact teams could be identified (i.e., M1-7 and W1-12). Also, each athlete was identified with an additional number that corresponded with his/her position on the team. For example, M4-3 played the third position on the fourth male team, and W7-4 was the skip on the seventh female team. Coaches were identified with a C, however, their number was intentionally not linked (did not correspond) to that of their team to protect anonymity. In line with the iterative process, the researcher noted some follow-up questions during transcription when she perceived some responses to be unclear or she wanted to ask further questions (Charmaz, 2014). Transcripts, along with any follow-up questions, were emailed to the athletes and coaches for authentication. Minimal changes to the transcripts were suggested and made, and all responses to the follow-up questions were integrated into the data.

Researcher reflexivity and memo writing. As the interviews were conducted, transcribed, and analyzed throughout the two-year span, reflection and memo-writing took place. The researcher reflected on the data and made notes on: a) different ways to ask questions and additional probes to use during interviews to elicit clear and thorough responses from participants, b) initial codes emerging from the data, and c) ways to conceptualize the coding tree and categorize the data. This facilitated the iterative process in which the data were constantly compared and contrasted (Charmaz, 2006). Formal data transcription could not always be completed prior to subsequent interviews because all but one focus group interview took place at a training camp or competitive event; several

interviews were thus often scheduled back-to-back. That said, the insights, perspectives, and experiences shared during one interview were noted in memos and influenced the questions and probes asked in subsequent ones, which is congruent with the iterative process as this facilitated constant comparison and permitted the researcher to reflect and also go "back and forth between data and analysis" (Charmaz, 2014, p. 11).

Data coding. The data were analyzed using Charmaz's (2006) recommended procedures. Each interview transcript was first broken down into comprehensive pieces of text (i.e., meaning units) that were then coded based on the content. During the early stages of analysis, coding was informed by regular dialogue between the researcher and supervisor in order to determine how to best code the data. In order to enhance the trustworthiness of the analysis process, each of the emerging codes relating to team processes (e.g., communication) and attributes (e.g., relationship characteristics) were operationally defined (see Appendix I). For instance, personal characteristics were defined as "the sum total of the physical, mental, emotional, and social characteristics of a member (e.g., competitive, patient, calm, focused, confident, etc.)." The definition of each of these codes was adapted and refined throughout the analysis process in order to best represent the data and the way they were categorized.

Alongside defining emerging codes, all of the data (i.e., meaning units) were grouped based on the different order codes that arose from the data, research questions, and interview guides, and a detailed coding tree was created. The first-order codes pertained to *factors* deemed necessary for optimal team functioning, *strategies* used by coaches and athletes to develop and maintain optimal team functioning, and the *roles* of coaches in this process. Throughout the analysis, data were compared and contrasted, and the coding tree was continuously refined. Second, third, and when applicable, fourth and fifth-order codes were created in order to be able to clearly categorize the data. For example, for the first-order code

entitled *factors*, a second-order code was created entitled *communication*. A third-order code was labelled *verbal communication*, and a fourth-order code was *be clear*.

As data analysis progressed and data were constantly compared and contrasted, new codes were added, some second, third, fourth, and fifth-order codes were modified and shifted in the coding tree, as were some of the data categorized under these codes. In the end, all of the transcribed data were analyzed a minimum of three times (i.e., initially, during multiple coder checks, and during verification and re-coding; see below). In the end, the data coding tree was revised 16 times in order to adequately reflect the data and codes. It was deemed that suitable data saturation was reached (Charmaz, 2006). For instance, no new first and second-order codes were discovered in the latter half of the coding process; only the odd third, fourth, or fifth-order code was created to account for specific details or examples.

Multiple coder checks. Multiple coder checks were performed throughout the data analysis process. First, the researcher and supervisor met regularly (minimum once per month) and exchanged several emails in order to discuss the evolution of the codes and coding tree and work through any uncertainties. This allowed the researcher to engage in critical reflection throughout the analysis process.

Once the data were fully analyzed, the researcher conducted additional multiple coder checks. She met with two doctoral students/colleagues from the research laboratory to explain the purpose of the study and provided them with a detailed explanation (verbal and written) of the coding tree, and a glossary of the first and second-order codes. Next, the two doctoral students were each emailed meaning units to code using the coding tree. The first student received 77 meaning units, that is, 4 or 5 meaning units from each of the first 16 interviews. The second student received 52 meaning units, that is, 4 from the remaining 13 interviews. The meaning units were purposefully selected to ensure a diverse representation

of the first and second-order codes. In total, 129 meaning units were coded independently. Once the students submitted their coding to the lead researcher, the latter met in person with the first student and corresponded through email with the second student who was out of the country in order to compare and discuss codes.

The aim of multiple coding was not to determine the level consistency between the researcher and coders. Rather, the purpose was to encourage the lead researcher to delve even deeper into the data and consider alternative possibilities. This is consistent with the notion of "multiple individual realities" (Mills et al., 2006b). As stated by Barbour (2001):

> What is ultimately of value is the content of disagreements and the insights that discussion can provide for refining coding frames. The greatest potential of multiple coding lies in its capacity to furnish alternative interpretations and thereby to act as the "devil's advocate" implied in many of the checklists in alerting researchers to all potentially competing explanations (p. 1116).

Discrepancies in the codes were noted and discussed, and the researcher reflected further on how to best code the data.

Verification and re-coding. Once multiple coding checks were completed, data analysis continued. The researcher returned to each of the 29 transcripts saved as Microsoft Word files to verify and refine, meaning unit by meaning unit, the coding performed in the earlier data analysis process. During this step, the researcher alternated between two different verification approaches. In the first approach, she hid her initial codes (i.e., first, second, third, fourth, and/or fifth-order) and then blindly re-coded them. If she coded the meaning unit the same way a second time, she was adequately convinced that she had interpreted the data in a logical, representative, and consistent manner. If there were discrepancies, she reflected on the meaning of the text and either added, removed, or changed any necessary

codes. In the second approach, the researcher read the meaning units and verified the codes to ensure she still perceived that they best represented the data.

The strength of this step was that the researcher reflected on and analyzed every single meaning unit several times during the data collection and analysis process – initially, during multiple coder checks, and during verification and re-coding. This was important because the coding tree changed significantly over the course of the analysis, and Barbour (2001) noted, "how researchers' original interpretations may shift when they revisit previously collected data" (p. 1116). Finally, after the researcher verified all of the coded data, the meaning units and codes were entered into NVivo 10 to facilitate data organization and retrieval. Some additional memos were also made at this point in the process.

As data were verified and recoded, individual concept maps were also created for each team and coach. These concept maps depicted key factors that each team and coach believed contributed to optimal team functioning on their specific team. In addition, strategies used by either the athletes and/or coach that contributed to each factor were linked and depicted, as were the roles of the coach that emerged. The purpose of this exercise was to facilitate a deeper understanding of the data, and to develop a visual representation of factors, strategies, and roles for each team and coach to facilitate the development of the theoretical model.

Model development. Once all data were entered and categorized in NVivo 10, the researcher created two data tables to synthesize the data – the first table represented the factors involved in developing and maintaining optimal team processes, and the second represented the strategies used by coaches and/or athletes and roles performed by coaches. Both the number of sources (i.e., number of athletes and coaches who discussed the factors, strategies, roles) and the number of references (i.e., number of times the factors, strategies,

and roles were cited by the athletes and coaches) were retrieved. All of the codes, and meaning units under the codes, were also printed and organized into binders to facilitate data retrieval during the model development stage.

Next, the researcher and supervisor met to examine the printed data and conceptual maps and begin to develop the theoretical model based on the data pertaining to 'factors'. At the time, there were 21 second-order codes related to factors, which the researchers explored, through constant comparison, in an effort to group them into broader components for the model. For example, a series of codes pertaining to beliefs and attributes of individual members (e.g., self-efficacy, personality, skill) were grouped in the model under 'individual attributes'. As components were created, these too were contrasted and compared in order to ensure that they best regrouped the data, and relationships between components were accurately depicted. The theoretical model was adapted and refined four times.

Model verification. Once the researchers were satisfied with the conceptualization of the model, they presented it to a 'panel of experts' in order to scrutinize it (Charmaz, 2006). The expert panel was comprised of six individuals: the High Performance Director of CC, a high performance curling coach who participated in the research, a high performance athlete who also participated in the research, an expert researcher in the areas of coaching and team building, a mental performance consultant working with high performance curlers, and a doctoral student. Each panel member was emailed the purpose of the study, a copy of the conceptual model, as well as a detailed explanation of it. They were asked to critically reflect on the model and answer questions such as "Is the model easy to understand and interpret (i.e., different components, relationships, definitions, examples)?" "Is it representative of team processes involved in curling?" "Is it presented and discussed in a way that coaches and athletes will be able to use it?" "Is there anything that should be added, modified, or deleted

based on your knowledge and experience in the sport of curling, coaching, and/or group dynamics? ” Each member of the expert panel emailed his/her comments to the researcher, after which a 2-hour group meeting was facilitated to discuss the model and seek additional feedback. The final version of the theoretical model was then created.

Writing Grounded Theory Research

According to Charmaz (2006), writing grounded theory is both an art and science, constructed by the researcher in order to “render through writing the multiple constructions of the participants and the relationship between the participants and themselves” (Mills et al., 2006a, p. 11). Accordingly, constructivist grounded theorists advocate for a writing style that is analytical, evocative (Charmaz, 2000; Mills et al., 2006b), and ideological (Charmaz, 2006). Although it is not necessarily viewed as the desired output of grounded theory by all scholars (e.g., Clark, 2003; Strauss & Corbin, 1998), diagramming and/or conceptual mapping can be a valuable tool in identifying relationships between codes and visually representing the data (Charmaz, 2006). In the present research, a visual model was developed through the analysis to depict how high performance coaches and athletes can develop and maintain effective team functioning in curling based on experiences and perceptions of influencing factors. Thus, unique in the present research is the diagram (i.e., model) that was created (see Article 2). It is believed that from an applied standpoint, coaches and athletes will more easily be able to understand and implement the components under which several processes and attributes were grouped because they were presented in a clear and comprehensive visual form.

Trustworthiness

Because of the fundamental role that the researcher plays in the construction of meaning, researcher preparation is an important variable to consider that influences the

trustworthiness of the inquiry process. As stated by Hallberg (2006), the manner in which "questions are asked and how the interviewer looks, acts, and sounds affects how the participant perceives him or her and how the interaction continues" (p. 146). Although the researcher has considerable experience facilitating individual coach interviews as well as focus group interviews with curlers based on her Master's thesis research, she completed pilot interviews prior to commencement of the current research. As previously mentioned, these interviews provided the researcher with additional practice and an opportunity to implement the interview guide. The researcher also participated in a bracketing interview facilitated the supervisor in order to explore her preconceived ideas regarding the research topic, and also to make note of how the supervisor probed to gain insights and further detail.

In addition to researcher preparation, a number of other methods were used in order to ensure trustworthiness. Firstly, transcribed focus group and individual interviews were sent to participants for verification. Secondly, throughout the process of data collection and analysis, the researcher engaged in debriefing sessions with her supervisor in order to discuss all aspects of the research, including challenges (e.g., scheduling interviews at competitions, Morgan & Giacobbi, 2006). As previously described, the analysis steps that were followed were rigorous and also allowed for thorough and continuous reflection and multiple rounds of coding. Finally, once the analysis was complete, a panel of coaching and sport psychology experts was asked to verify the coherence of the theoretical model (Backman & Kyngäs, 1999).

PART III

Results

The following section presents the results of this research in the form of four articles. Article 1 provides a critical review of existing theoretical frameworks of team processes used to guide research and/or practice in sport. Article 2 presents the factors involved in developing and maintaining optimal team functioning in high performance curling, and the resulting grounded theory model. Article 3 depicts the strategies used by coaches and athletes to achieve effective team functioning. Finally, Article 4 outlines the roles of coaches in optimizing team functioning, as perceived by both coaches and athletes. The articles are presented in the format required by the scientific journals to which they were submitted for publication.

Article 1

Frameworks of team processes in sport:

A critical review with implications for practitioners

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University of Ottawa

Frameworks of Team Processes in Sport: A Critical Review with Implications for Practitioners

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Abstract Researchers have directly or indirectly examined team processes that contribute to team functioning and effectiveness in sport. However, in doing so, they have typically focused on team cohesion, they have not consistently addressed the theoretical/conceptual frameworks underpinning their work, nor have they comprehensively derived implications for practice. Furthermore, existing meta-analyses and reviews on cohesion and team building address results of empirical studies and do not evaluate the specific theoretical/conceptual frameworks used to guide these studies. Consequently, the purpose of this study was to critically review theoretical/conceptual frameworks directly or indirectly addressing team processes in sport and derive implications for professional practice. Seven frameworks used to guide research and/or practice in sport were identified for inclusion in this study. Three frameworks were borrowed from general psychology and the other four stemmed from sport psychology. These frameworks targeted a variety of specific team processes and six different outcomes, the most common of which was cohesion. Specific team processes were categorized under broader team processes, the latter of which were linked to one of ten general themes. The theme pertaining to roles/norms was the most prevalent one as it was addressed in six out of the seven frameworks. Conversely, one of the least prevalent general themes related to goals; it was only discussed in two of the seven frameworks. Implications for practitioners aiming to optimize team processes in sport and recommendations for future research are presented.

Keywords Team Processes, Team Building, Team Dynamics, Theoretical Frameworks, Sport, Practitioners

1. Introduction

Words such as ‘teamwork’, ‘cohesion, ‘chemistry’, and ‘unity’ have been used in association with highly successful teams. Indeed, several scholars have directly or indirectly shed light on team processes that contribute to team functioning and effectiveness in sport. Moreover, several frameworks have been proposed to guide research and practice in this context. However, research has been fragmented [1], focusing on few rather than exhaustive team processes and prioritizing team cohesion. Furthermore, attempts to transfer knowledge have been limited. In fact, few concrete guidelines have been proposed in the literature to help practitioners nurture team processes and effectiveness within different sports [2,3]. Consequently, it is challenging to determine how empirical knowledge can be used in practice.

The overall purpose of this study was to critically examine frameworks of team processes in sport and draw implications for practitioners. The specific objectives were to (a) identify theoretical/conceptual frameworks in the literature addressing one or more team processes relevant for sport, (b) identify the specific team processes directly or indirectly targeted in these frameworks along with outcomes, (c) determine broader team processes and general themes and compare them across frameworks, (d) evaluate the frameworks based on their strengths and limitations, (e) report or infer implications for practice, and (f) make recommendations for future research. As noted by Goodger and colleagues [4], reviews such as this are valuable as they “consolidate findings and identify the known and the unknown” (p. 129). Although several constructs have been presented in existing frameworks, certain underlying team processes and ways they may be applied in practice remain ambiguous or "unknown". Intended outcomes are also sometimes vague and ill-defined. Moreover, while meta-analyses and reviews on cohesion and team building have been conducted in the past [e.g., 5,6,7,8], they pertain to concrete results of empirical studies and do not evaluate the specific theoretical/conceptual frameworks used to guide these studies.

2. Review Method

We selected each framework based on a review of scientific articles related to team processes found in several electronic databases (e.g., SPORTDiscus, Google Scholar, ERIC) as well as key group dynamics texts [e.g., 9,10]. A number of key

words were used when searching for frameworks, for example, group/team dynamics, group/team processes, cohesion, team building, team effectiveness, team functioning, teamwork, team chemistry, and team unity. Additionally, specific team processes were also searched, such as communication, interaction, and coordination. Only theoretical or conceptual frameworks used to guide research and/or practice in sport (i.e., scientific articles, textbooks) were included in this study. As such, the most recent conceptual framework for teamwork and team effectiveness put forth by McEwan and Beauchamp [1] was not included as it has yet to be used in sport psychology research or practice. This framework will, however, be addressed in the discussion section.

Our review and analysis consisted of seven steps: (a) we first searched electronic databases; (b) we then read the literature to identify frameworks used to guide research and/or practice in sport; (c) after selecting the seven frameworks, we reviewed in more depth the literature pertaining to these frameworks; (d) next, we performed a content analysis using the literature describing the frameworks in order to identify the specific team processes that were explicitly reported [e.g., set team goals, 11] or that could be implicitly inferred based on definitions and descriptions of constructs [e.g., identify actual and required resources, 12] within each framework; (e) we subsequently conducted a second level of analysis to extract broader team processes based on the list of specific team processes that we generated in the previous step; (f) we then engaged in a third level of analysis to identify general themes under which we could regroup the broader team processes; and (g) we compared specific team processes, broader team processes, and general themes at all levels of analyses and summarized the results in two comparative tables.

Seven frameworks used to guide research and/or practice in sport were identified for inclusion in this study. These frameworks targeted a variety of specific team processes and anywhere from two to twelve broader team processes and one to three main outcomes. Table 1 provides a summary of these processes and outcomes. In the first column, the seven frameworks are identified (e.g., framework for examining the correlates of cohesion). The specific or 'raw' team processes addressed in each of the frameworks are then presented in column 2 based on the authors' descriptions [e.g., identify individual team members' orientation/motivation for being part of the team, address individual differences, and nurture member satisfaction (personal factors)]. From the specific team processes, broader team processes were then inductively identified in column 3 in an effort to group specific processes in a way that would facilitate comparison (e.g., identify/respect personal characteristics). Finally, the outcomes targeted in each framework are presented in column 4. With regards to Table 2, the broader team processes presented in the third column of Table 1 were further inductively categorized under ten general themes (e.g., personal characteristics), which are presented along the top of Table 2. The 'X's indicate which particular general theme were addressed in the seven frameworks. As such, Table 2 presents the most and least common general themes addressed across frameworks (as seen in the totals at the bottom of Table 2). It also highlights the most comprehensive frameworks (i.e., frameworks targeting the most general themes, as seen in the totals in the last column of the Table 2).

3. Review of Frameworks

In our review of the literature, we examined key definitions and situated the concept of "team processes" in sport. Prior to the 1980's, sport cohesion research lacked a sound theoretical and/or conceptual foundation [13,14]; cohesion was defined and measured differently in nearly every study [15]. In response to the conceptual obscurity, Carron [14] proposed an operational definition of cohesion in which it was characterized as being multidimensional, dynamic, and instrumental. Later, an affective dimension was added to reflect the social relationships that develop among team members [16]. Thus, cohesion in sport was eventually defined as a "dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" [16, p. 213]. This definition now forms the basis of nearly all of the sport cohesion research [9,17].

Of interest, the specific "dynamic process" to which Carron and colleagues [16] alluded in their definition has not been examined in great depth. Consequently, there has been a call for exploring *team processes* that contribute to enhanced cohesion and performance in sport in order to understand *why* such relationships exist [13,18,19]. In the *general group dynamics* literature, processes refer to "acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward... [achieving] collective goals" [20, p. 357]. In the *sport psychology* literature, processes are defined as the "intrapersonal and interpersonal actions by which individuals transform their resources into performance" [21, p. 3]. They "represent the dynamic interactions that are a fundamental, integral characteristic of group involvement" [9, p. 263]. Considering these definitions, it can be argued that the dynamic processes in which members of a team engage are key to achieving different outcomes. Such team processes were the focus of our review and analysis and are discussed in relation to each framework next.

3.1. Frameworks from General Psychology

3.1.1. Tuckman's [22] Theory of Group Development

Tuckman's [22] theory was included in this review as it is one of the first to highlight different processes involved in group development. This scholar's framework is often cited in both the general and sport group dynamics literature because it provides support for the notions that task and social cohesion change over the course of a team's formation and development [23].

Tuckman [22] suggested that groups or teams evolve through different linear stages, which he summarized as forming, storming, norming, and performing; a fifth stage, adjourning, was later added to account for team termination [24]. Twelve broader team processes related to these stages were identified (i.e., identify tasks; identify context; establish relationships; identify organizational standards; identify/ challenge personal characteristics; identify/ challenge team characteristics; communicate/ respect personal characteristics; communicate/ respect team characteristics; establish roles and norms; adapt/fulfill roles; converge members' attention on tasks; terminate relationships), which impact the two main outcomes of cohesion and performance (see Table 1). In the *forming* stage, team members orient themselves to one another, the task, and the context, and test the boundaries for interpersonal task behaviours. During this stage, relationships with leaders and other team members are established, and members familiarize themselves with organizational standards (e.g., norms). In the *storming* stage, teams undergo a period of interpersonal conflict (e.g., hostility towards team members stemming from expressing individuality) and members polarize. During *norming*, opposition subsides, as team members begin to accept individual differences and idiosyncrasies. Roles and norms are established, team members are able to communicate personal opinions, and 'in-group' feelings start to develop. This in turn leads to successful task execution during the *performing* stage wherein members develop functional role relatedness. Team members adapt and fulfill their roles and team energy is channeled towards task performance [22,25]. In the *adjourning* stage, the team prepares for dissolution and relationships are terminated [24]. Essentially, teams must develop the aforementioned processes and unite in order to advance to the next stage of development, otherwise they could prematurely disband. According to Tuckman [22], the sequence of stages remains the same for all teams, however, the duration of each stage varies across teams.

Although Tuckman's [22] linear stage model has several merits, it fails to account for the *extent* to which cohesion is dynamic and for the shifts that occur in interpersonal relationships over the course of a team's existence. Rather, cohesion should be viewed as being in a constant state of flux characterized by peaks and valleys [2]. Moreover, teams may revisit some of the stages at different times in their development or may completely skip a stage [26]. For example, if a soccer team returns for a second season with only a few line changes, they may not spend time in the forming stage and may instead skip directly to storming [9]. That said, it should be noted that when Tuckman [22] developed his framework, cohesion was not yet defined as a dynamic and multidimensional process but rather as forces holding a group together [9]. Additional limitations of Tuckman's [22] framework are consistent with most stage theories. Specifically, it can be criticized for: (a) the blurred separation between stages [26]; (b) its failure to account for the psychological mechanisms that help a team move from one stage to another; and (c) its disregard for the external environment [14].

Despite these criticisms, there are several valuable implications for practitioners. As previously stated, Tuckman [22] suggested that team processes evolve over the course of team formation and development. Thus, knowledge of the five stages is useful as it can help practitioners: (a) anticipate when and what types of problems might arise over the course of team development, (b) normalize issues relating to team dynamics as a natural and essential part of becoming a cohesive team, and (c) tailor interventions to the specific needs of teams at specific times. For example, practitioners with knowledge of the forming stage would expect to see members engaging in 'testing' or exploration to determine the limits of behavior [22]. Thus, when certain behaviours become evident, it would signal an appropriate time to address norms and expectations, for example, by having teams create and sign a code of conduct. By staying mindful of the five stages, it can allow practitioners to periodize their work with teams [27] so as to ensure that they are addressing key processes at the right point in their development, thus helping members progress towards performing at the right time.

3.1.2. Steiner's [12] Theory of Group Productivity

Steiner's [12] theory of group productivity was included in this review because of its unique focus on productivity and resources, which are not explicitly addressed in the other frameworks. In general, Steiner [12] referred to productivity as what individuals or teams accomplish. We identified four broader team processes (i.e., identify personal characteristics; identify team characteristics; coordinate actions; establish roles) that contribute to the main outcome of productivity (i.e., effectiveness and efficiency of task achievement) in this framework (see Table 1).

According to Steiner [12], a team's actual productivity is equal to its potential productivity, defined as the amount of relevant resources available (e.g., knowledge, attributes, and skills of team members) minus the losses due to faulty team processes. These faulty team process losses, which stem from the actions of team members, can be caused by either a loss of individual productivity (reduced motivation) and/or poor coordination of members [9]. The potential for productivity

Table 1. Summary of processes and outcomes targeted in theoretical/conceptual frameworks of team processes in sport

Framework		Specific Team Processes	Broader Team Processes	Outcomes
Emerged from General Psychology				
1. Theory of group development [22,24]	a)	Orient members to the task; create ground rules; test boundaries for interpersonal task behaviours; establish relationships with leaders and each member; identify organizational standards (forming stage)	Identify tasks Identify context Establish relationships Establish norms	Cohesion Performance
	b)	Confront interpersonal issues; confront emotional responses to tasks (storming stage)	Identify/challenge personal characteristics Identify/challenge team characteristics	
	c)	Promote acceptance of individual differences/idiosyncrasies; facilitate expression of personal opinions; establish roles and norms; prioritize the team as an entity and strengthen 'in-group' feeling (norming stage)	Communicate/respect personal characteristics Communicate/respect team characteristics Establish roles and norms	
	d)	Develop functional role relatedness; solve problems as members adapt and fulfill their roles; channel energy into tasks (performing stage)	Adapt/fulfill roles Converge members' attention on tasks	
	e)	Terminate relationships (adjourning stage)	Terminate relationships	
2. Theory of group productivity [12]	a)	Identify actual and required resources (e.g., knowledge, attributes, skills of team members)	Identify personal characteristics Identify team characteristics	Productivity
	b)	Coordinate team members' actions	Coordinate actions	
	c)	Motivate team members by clarifying their role in/contribution to task achievement	Establish roles	
3. Personality-based preference framework for team communication [36]	a)	Assess preferences for interacting and communicating with team members	Identify personal characteristics	Team functioning
	b)	Develop awareness and understanding of patterns of preferences for each team member	Identify personal characteristics	
	c)	Communicate with team members based on identified preferences	Communicate/respect personal characteristics	
Emerged from Sport Psychology				
4. Framework for examining the correlates of cohesion [14]	a)	Identify contractual responsibilities/obligations (e.g., eligibility rules) and organizational orientation (e.g., age limitations; environmental factors)	Identify/respect context	Cohesion Performance Satisfaction
	b)	Identify individual team members' orientation/motivation for being part of the team, address individual differences, and nurture member satisfaction (personal factors)	Identify/respect personal characteristics	
	c)	Identify necessary coach leadership behaviour and style, and establish coach-athlete relationships (leadership factors)	Establish relationships Establish leaders	
	d)	Identify group orientation, motives, and norms (team factors)	Identify team characteristics Establish norms	
5. Conceptual model of cohesion [41]	a)	Converge team members toward task achievement (GI-T)	Converge members' attention on tasks	Cohesion
	b)	Establish relationships to connect team members (GI-S)	Establish relationships	
	c)	Identify each member's contributions to/satisfaction with task achievement (ATG-T)	Establish roles	
	d)	Establish friendships within the team (ATG-S)	Establish relationships	

Table 1. Summary of processes and outcomes targeted in theoretical/conceptual frameworks of team processes in sport (continued)

Framework		Specific Team Processes	Broader Team Processes	Outcomes
6. Conceptual framework of team building [9,11,49]	a)	Highlight distinctive group characteristics (environmental factors)	Identify team characteristics	Cohesion
	b)	Clarify and accept roles/positions, conform to norms, and develop leadership (group structure factors)	Establish/fulfill roles and norms Establish leaders	
	c)	Set team goals, make sacrifices, cooperate, and communicate/interact (group process factors)	Set goals Cooperate Communicate	
7. Social-cognitive framework of team coordination and communication in sport [32]	a)	Set goals, plan to achieve tasks, allocate roles and responsibilities (pre-process coordination)	Set goals Plan tasks Establish roles	Coordination
	b)	Communicate and adapt (in-process coordination)	Communicate Adapt to tasks and context	
	c)	Communicate and evaluate (post-process coordination)	Communicate Evaluate tasks and context	

Table 2. Summary of general themes targeted in theoretical/conceptual frameworks of team processes in sport

	Task	Context	Relationships	Roles/norms	Personal characteristics	Team characteristics	Goals	Communication	Cooperation/coordination	Leadership	Total
1. Theory of group development [22,24]	X	X	X	X	X	X		X			7
2. Theory of productivity [12]				X	X	X			X		4
3. Personality-based preference framework for team communication [36]					X			X			2
4. Framework for examining the correlates of cohesion [14]		X	X	X	X	X				X	6
5. Conceptual model of cohesion [41]	X		X	X							3
6. Conceptual framework of team building [9,11,49]				X		X	X	X	X	X	6
7. Social-cognitive framework of team coordination and communication in sport [32]	X	X		X			X	X			5
Total	3	3	3	6	4	4	2	4	2	2	

may increase with team size due to the additional resources available. However, eventually all of the necessary resources are present, at which point additional members only lead to a greater likelihood of team process losses [9]. Thus, it can be inferred that to maximize productivity, the following specific team processes are important: (a) identify the actual and required resources to achieve a task (e.g., determine the optimal number of members on a team), (b) coordinate team members' actions, and (c) motivate team members by clarifying their role in task achievement. Although not developed specifically for sport, Steiner's [12] theory has been viewed as applicable in this context due to its performance orientation and has guided much of the research on group size and social loafing in sport [28].

Interestingly, poor coordination of members has been proposed as the primary cause of reduced individual productivity in groups [29,30]. However, Eccles [31] noted that studies have not particularly explored this relationship and mainly focused on reduced individual productivity such as motivation and social loafing. As such, coordination losses and the coordination of tasks have gone unexplored [32]. The reason for disregarding coordination losses in sport teams is unclear but there are possible explanations. It may be due to the social rather than cognitive perspective typically adopted when studying sport teams [32,33] and/or the inherent difficulty in studying team coordination, in part due to an absence of measurement instruments [32]. To date, scholars have only been able to speculate that decreasing performance with increasing team size has been a result of poor coordination [34].

Despite its use in past research, limitations of Steiner's [12] theory must be addressed. First, it is difficult to determine the relationship between resources (i.e., individual psychosocial attributes and ability) and group effectiveness given that individuals have varying skills and personalities [12]. An additional limitation of Steiner's [12] theory is that it cannot account for when groups actually *exceed* their potential. As stated by Forsyth [26], "when people work in groups, they sometimes gain new solutions, energy, and insights into old problems that they would never have achieved as individuals" (p. 305). Thus, Forsyth [26] proposed that actual productivity equals potential productivity minus losses owing to faulty processes *plus* gains due to good processes, a phenomenon that cannot be explained using Steiner's [12] theory. The view that groups can exceed their potential is in line with the aim of team building interventions, which involve "blending the talents and strengths of individuals into a force that becomes greater than the sum of its parts" [21, p. 1].

Despite the aforementioned limitations, Steiner's [12] theory has practical implications for both group selection and maintenance. First, when forming a group, it is important that practitioners be mindful of the resources available within the group, such as the physical and/or cognitive ability of members, as well as the group size. Practitioners should then consider the following questions: (a) Based on the demands of the tasks, are these resources sufficient or are additional ones required? (b) What is the optimal group size that will allow members to effectively work together and achieve coordination? One may think that it is better to select more athletes in order to have the greatest potential resources (e.g., additional players from which to choose in case of injury, scheduling conflicts), however, Steiner's [12] theory suggests that this may do more damage than good from a coordination perspective. After team selection, practitioners should then be aware of strategies that can be used to promote effective team processes, and therefore minimize process losses. For example, process losses due to decreased motivation may be reduced by clarifying tasks and each member's role in accomplishing them so that each person feels like he or she is making a valuable contribution to the group. Losses may also be minimized by evaluating individual outputs so that each member is held accountable for his or her performances. For instance, a basketball coach could have an assistant track the statistics of a few players each game (e.g., shooting and freethrow percentages, turnovers, fouls) and discuss those statistics with the athletes after the game. From a coordination perspective, losses may be reduced by facilitating the development of shared knowledge via team post-game debriefs. For example, by reviewing videos of in-game coordination breakdowns with the whole team, practitioners could discuss with team members how to work more effectively together in similar future situations [35].

3.1.3. Beauchamp, Maclachlan, and Lothian's [36] Personality-Based Preference Framework for Team Communication

A third framework that has been used in sport psychology research is that of Beauchamp and colleagues [36]. Integrating Jung's [37] theory of personality types, these scholars proposed a personality-based preference framework for team communication that is unique in that it focuses on *awareness* and *preferences* for communication and interaction, which are not systematically addressed in any of the other frameworks included in this review. Within this framework, we identified two broader team processes (i.e., identify personal characteristics; communicate/respect personal characteristics) and the main outcome of team functioning (see Table 1).

Jung [37] suggested that people's personality emerges in the form of set preferences about the way they view the world. These differences stem from four functions (i.e., thinking, feeling, sensing, and intuition), and two attitudes (i.e., extraversion and introversion), which give rise to eight cognitive and behavioural preferences (e.g., extraverted thinking, introverted thinking, etc.). Based on the framework, in order to optimize team functioning, team members must assess preferences for interaction and communication with team members, develop an awareness and understanding of patterns of preferences of team members, and communicate with team members based on the identified preferences. According to Beauchamp and colleagues [36], by becoming more aware of behavioural preferences, team members may gain insight into how they like to: "(a) communicate and be communicated with..., (b) interact with teammates in both practice and social situations..., (c) resolve

interpersonal conflicts..., and (d) deal with stressful situations" (p. 210-211). Assessment can be carried out using recognized instruments such as the Myers-Briggs Type Indicator (MBTI) and the Insights Discovery Evaluator (IDE) [38].

Beauchamp, Jackson, and colleagues [38] argued that it would be pointless to try and enhance or stifle the personality characteristics of team sport athletes. Instead, the emphasis should be on developing an awareness of the self and others. Beauchamp, Lothian, and Timson [39] conducted a team building intervention using the personality-based preference framework for team communication, which yielded promising results as it led to increased intra-group trust and cohesion, as well as improved group functioning. Moreover, implicit support for the framework is evident when examining recent team building interventions that have focused on increasing individual and collective awareness [2] and promoting mutual sharing and understanding [3,19].

Merits notwithstanding, Beauchamp and colleagues' [36] framework is based on personality types and personality research in sport has been subject to a number of criticisms (e.g., role of the environment and its impact on behaviour is neglected). That said, the authors did emphasize that personality-based preferences were considered to be the result of both dispositional and situational factors. While personality tests are used in the assessment of preferences, the authors stressed that the purpose of this assessment is not to predict athletic success but rather to provide team members with a tool for increasing awareness.

Limitations aside, Beauchamp and colleagues' [36] framework highlights the importance of considering individuals' preferences for communication within the context of a team. Even in the absence of quantitative measures, practitioners can ask team members key questions in order to facilitate the development of a better understanding of themselves and their teammates. Sample questions might include: (a) When you make a mistake, what do you typically think and feel? (b) What can your teammates say or do to help you bounce back after mistakes? (c) What can you say or do to your teammates to help them reset after mistakes? A focus should be placed on not only each individual's preferences for communication, but also where each individual's preferences fit into the team as a whole. Once team members have a greater understanding "of what makes others…'tick', this understanding can be used as a framework to help individuals communicate and interact more effectively within team situations" [38, p. 35]. For example, if team members understand that when a certain teammate makes a mistake, she gets really frustrated and angry with herself and needs a moment to calm down, they are then able to support her by giving her a minute of space before regrouping to talk about the next play.

3.2. Frameworks from Sport Psychology

3.2.1. Carron's [14] General Framework for Examining the Correlates of Cohesion

Carron's [14] general framework for examining the correlates of cohesion was pioneering in the field of sport psychology given the lack of theoretical frameworks for the study of cohesion in sport. Although Carron does not address specific team processes, we inferred six broader processes (i.e., identify/respect the context; identify/respect personal characteristics; establish relationships; establish leaders; identify team characteristics; establish norms) and three outcomes (i.e., cohesion, performance, satisfaction) based on the factors contributing to cohesion and performance he proposed (see Table 1). The framework is based on a hierarchy of four antecedents: (a) environmental factors (i.e., identify contractual responsibilities/obligations and organizational orientation); (b) personal factors (i.e., identify individual members' orientation/motivation, address individual differences, and nurture member satisfaction); (c) leadership factors (i.e., identify necessary leadership behaviour and style, and establish coach-athlete relationships); and (d) team factors, which are influenced by the other aforementioned factors (i.e., identify group orientation, motives, and norms). All four factors impact the throughput (i.e., type and level of cohesion present), with team factors exerting the most significant and direct impact. In turn, the type and level of cohesion influence individual (e.g., satisfaction) and group (e.g., performance) outcomes [14].

Of importance, Carron's [14] framework provided scholars with both a reference point for subsequent research and a means for making sense of incongruous findings. This resulted in an evolving conceptualization of cohesion in sport. For example, in the early version of Carron's [14] framework, only unidirectional relationships were depicted and moderating factors were ranked in order of importance. However, the model was later adapted in response to budding research in order to highlight the bidirectional nature of the antecedent-cohesion relationships [40] and the interdependent nature of the antecedents [9]. Carron's framework inspired extensive research on antecedent-cohesion and cohesion-outcome relationships in sport [9,13].

Unfortunately, Carron's [14] framework does not specifically address the mechanisms (i.e., team processes) by which these relationships exist and develop. We inferred some processes based on the four factors presented in the model and the actions required to develop and/or maintain each one. The framework was initially developed to "help investigators systematically organize the research pertaining to cohesion" [28, p. 226], yet over the years, this purpose appeared to be misconstrued. As Carron and colleagues [9] stated in an author's note, "it was never intended to be a definitive view of the elements that cause cohesion and/or result from cohesion – although it was interpreted that way by a number of authors" (p. 242). Consequently, although Carron's [14] framework for examining the correlates of cohesion provides a valuable means for organizing research on the topic, researchers must be cautious not to look at the subject using a narrow research lens.

Despite not addressing specific team processes, Carron's [14] framework can provide direction to practitioners working with teams. Specifically, the framework demonstrates that in order to foster cohesion, there must be a certain level of congruence between the situation, the individuals on the team, leadership, and the team as a whole [9]. Interventions must target all areas

where there is potential for enhancement. For example, cohesion can be fostered among team members through increased physical and functional proximity [an environmental factor; 9], therefore rooming assignments (e.g., pair a veteran with a rookie), tasks (e.g., get the defensive squad to discuss tactics), or team social gatherings (e.g., plan an activity for a teammate's birthday) can be used to promote closeness and communication among team members. Similarly, because a participative style of decision-making [a leadership factor; 9] is associated with cohesion, practitioners can facilitate discussions wherein team members are involved in making decisions. For example, a team meeting could be scheduled early in the season wherein team members could brainstorm and vote on team objectives for the season, as well as create team norms by discussing and deciding upon acceptable standards for behavior (e.g., punctuality, respect, support).

3.2.2. Carron, Widmeyer, and Brawley's [41] Conceptual Model of Group Cohesion

After Carron [14] created the general framework for examining the correlates of cohesion, Carron and colleagues [16] recognized that there were still limitations in the literature regarding the definition and conceptualization of cohesion. As such, they proposed a conceptual model of cohesion to further expand the literature, from which three broader team processes (i.e., converge members' attention on task; establish relationships; establish roles) and one outcome (i.e., cohesion) were identified (see Table 1).

This framework is important and was included in this review as a complement to Carron's [14] framework because it indirectly alludes to team processes and suggests that every team member "develops and holds perceptions about his/her team that are related to the group as a totality and to the manner in which the group satisfies personal needs and objectives" [42, p. 119]. It is the strength of these perceptions that keeps groups together. These perceptions are categorized as group integration (GI), which refers to a member's perceptions of closeness within the group, and attraction to group (ATG), which describes a member's motivations and feelings that attract him or her to the group [9,41]. These perceptions have both a task (T) and social (S) foci, thus there are four manifestations of cohesion in sports teams [i.e., GI-T, GI-S, ATG-T, and ATG-S; 9]. Accordingly, specific team processes alluded to in the model include: (a) converge team members towards task achievement (GI-T), (b) establish relationships to connect with team members (GI-S), (c) identify each team member's contributions to/satisfaction with task achievement (ATG-T), and (d) establish friendships within the team (ATG-S).

This model has formed the basis for the most widely used cohesion assessment instrument (the Group Environment Questionnaire, GEQ) and is based on three assumptions: (a) cohesion can be measured through individual perceptions of group members; (b) cognitions regarding cohesion involve both the group and the individual (i.e., GI and ATG); and (c) there are both task and social dimensions of cohesion [28]. As is the case with Carron's [14] model, Carron and colleagues' [41] conceptual model of group cohesion did not include specific team processes, however, these were inferred based on the manifestations discussed (i.e., integrate group members, attract individual members to the group).

There are a number of advantages to Carron and colleagues' [41] conceptualization of cohesion and its resultant questionnaire. This marked the first time that there was "consistency in the construct-operational definition link" in sport cohesion research [13, p. 362]. Previously, sport researchers had borrowed definitions from other contexts and "rarely... attempted to clarify the construct before measuring it" [41, p. 246]. For example, this was reportedly the case for the Sport Cohesiveness Questionnaire [SCQ; 43] and the Multidimensional Sport Cohesion Instrument [MSCI; 44], which limited their psychometric properties and applicability to sport research [13,45].

Despite the obvious merits of the conceptual model of group cohesion and its corresponding measurement instrument, there are limitations. For example, the model only considers perceptions of individual members and thus assumes that members of cohesive teams share beliefs about cohesion [17]. However, there exists limited evidence that the notion of shared beliefs is valid [46,47], which begs the question: What should be the unit of analysis in sport cohesion studies – the individual, the group, or both? Further research is needed in order to provide additional validation for the model both at the conceptual and measurement level.

Despite these limitations, Carron and colleagues [41] highlight the importance of team members' individual motivations and feelings towards the group, both in regards to task and social elements. Based on the definitions of the GI-T, GI-S, ATG-T and ATG-S subscales, it is evident that group dynamics interventions need to focus on four aspects: (a) making members feel like they are unified in the pursuit of their goals (GI-T), (b) creating a social environment wherein team members feel close and connected to one another (GI-S), (c) ensuring that each member feels that he or she makes a valuable contribution to goal achievement (ATG-T), and (d) helping members develop friendships so that they feel like they belong (ATG-S) [25,48]. Intervention strategies can then target these four aspects. For instance, to address the GI-T aspect, practitioners can involve individuals in team goal setting practices, thereby promoting a sense of engagement while working towards a personally meaningful and common goal. Practitioners can also encourage athletes to establish team norms and expectations, and hold them accountable for their actions through the use of monitoring or evaluative strategies. By doing so, athletes are able to recognize their own contribution, as well as that of each teammate, in their goal pursuit.

3.2.3. Carron and Spink's [9,11,49] Conceptual Framework of Team Building

Carron and Spink's [49] conceptual framework of team building was included in this review given that it was the first one in sport and exercise psychology that explicitly addressed team processes relevant to enhancing cohesion and team functioning. With a focus on the process of team building, it is an applied framework with relevant implications for practitioners. Six broader team processes were identified in the framework (i.e., identify team characteristics; establish/fulfill roles and norms; establish leaders; set goals; cooperate; communicate) that contribute to the outcome of cohesion (see Table 1).

Team building is the process of "team enhancement or team improvement for both task and social purposes" [9, p. 327]. Carron and Spink [49] proposed a conceptual model of team building for use in exercise settings that has since received widespread use in the context of sport. The framework forms a foundation for implementing interventions and suggests that in order to achieve the desired output (i.e., task and social cohesion), three categories of group characteristics must be targeted: two *input* categories (i.e., group environment and group structure) and one *throughput* category (i.e., team processes). A specific inferred team process related to the group environment involves highlighting distinctive team characteristics, whereas processes targeting group structure include clarifying and accepting roles and positions, conforming to norms and developing leadership. Explicitly reported *throughput* team processes consist of setting goals, making sacrifices, cooperating, and communicating/interacting [9,11,49]. Embedded within the model of team building is a four-stage *indirect* (i.e., via the coach and not the athletes) intervention process that involves an introductory stage, conceptual stage, practical stage, and intervention stage [11,49]. During the first three stages, a practitioner works with the coach to help him or her establish the team building intervention (e.g., practical strategies, techniques, procedures, protocols). The coach then delivers the intervention in the fourth stage.

Several scholars have recognized the contribution of Carron and Spink's [49] model as it provides researchers with a more systematic and scientific approach to team building interventions [18,50]. Moreover, the framework highlights something that is missing from Carron and colleagues' [41] conceptual model of group cohesion and Carron's [14] general framework for examining the correlates of cohesion, that is, specific team processes and strategies to enhance cohesion and performance [13]. The indirect approach to team building is also considered advantageous as it combines the practitioner's knowledge of the process with the coach's knowledge of the group [51]. However, this model's strong emphasis on the coach's commitment and involvement brings forth some limitations.

As noted by Eitington [52], in order to be able to create change, leaders must have a number of qualities such as excellent listening skills, an ability to give and receive constructive feedback, and a capacity to create an environment of support and openness. They must also have considerable time, patience, commitment, and knowledge [50]. Interestingly, coaches' ability and commitment to delivering team building interventions has been questionable in a number of studies showing little or no effect [e.g., 11,51]. This has led scholars to suggest that a team diagnosis or assessment stage should preface the introductory stage in Carron and Spink's [49] framework [13,18]. Moreover, the belief that coaches *must* facilitate team building interventions is not as prevalent in the literature and consequently, researchers conducting intervention-based research are promoting a direct service approach involving trained practitioners [e.g., 2,3,19,53]. Finally, an additional limitation of the framework stems not from the framework itself, but from the methodological approach used to examine or implement interventions. Specifically, despite that team building is a longitudinal process, most studies are relatively short-term (i.e., 13 weeks or less) [8], thus long-term studies are warranted.

Despite these limitations, Carron and Spink's [49] framework has valuable implications for practitioners due to its emphasis on team processes, such as communication/interaction, cooperation, and goal setting [9,49]. Given the impact of the group environment and structure on these various team processes and subsequent level of cohesion, practitioners should intervene at each level of the model. For example, they can address both the team structure and team processes by involving team members in regular meetings to discuss team norms, individual roles/positions, and leadership. During this time, veteran group members can be empowered to assist incoming members in adjusting to the new group climate and encouraging them to work together. Similarly, the team environment can be addressed by promoting distinctiveness, for example, by encouraging team members to communicate and interact with one another to develop a team identity, motto, or cheer [9,11]. Prompting team members to wear the same attire when they travel, wear matching warm-up suits, or dye their hair the same color for the playoffs would also promote distinctiveness.

3.2.4. Eccles and Tenenbaum's [32] Conceptual Framework of Coordination in Teams

The last framework by Eccles and Tenenbaum [32] was included given its explicit focus on the team processes of coordination and communication in sport. Six broader team processes (i.e., set goals; plan tasks; establish roles; communicate; adapt to tasks and context; evaluate tasks and context) were found to contribute to the outcome of coordination (see Table 1). The premise is that teams require coordination in order to be effective, which relies on shared knowledge. Coordination is "the process of arranging team members' actions so that, when they are combined, they are in suitable relation for the most effective result" [35, p. 32]. Shared knowledge can be acquired via pre-process, in-process, and post-process coordination [32]. Pre-process coordination includes setting goals, planning to achieve tasks, and allocating roles and responsibilities. In-process

coordination relies on communication and includes adaptation. Finally, post-process coordination also relies on communication and involves evaluation.

As noted by Ward and Eccles [54], previously, scholars interested in team communication focused on factors that influence it (e.g., age, sex, religion, language, and culture) and the effect of communication on team cohesion and conflict. Eccles and Tenenbaum [32] were the first to examine team communication in relation to team coordination and performance. Their framework fills a gap in the literature by examining *how* teams achieve coordination, and the communication necessary for coordination [55,56].

Alas, the evaluation of Eccles and Tenenbaum's [32] framework has been limited due to the lack of measures of coordination and communication in sport. Still, researchers have used video and audio recordings of athletes' performances to examine team communication [56] and coordination [55]. While these studies go a long way in describing coordination, the challenge for researchers will be to develop explanatory measures that "allow performance differences...to be captured, and that can be subsequently explained by individual and/or team process measures" [54, p. 477].

Despite the absence of assessment methods, Eccles and Tenenbaum's [32] framework suggests key ways that practitioners can help team members effectively work together. Specifically, practitioners should implement strategies that facilitate the development of shared knowledge. For instance, Eccles and Tran [35] recommend a number of solutions, one of which is 'position switching', in order for individuals to increase their understanding of the actions executed by other team members, thus allowing them to adapt and better coordinate their actions. Additional strategies to enhance shared knowledge relate to the ways in which game or action plans are communicated. For example, the authors recommend that when communicating plans to team members, practitioners should cater to athletes' preferred learning styles, repeat information, provide handouts or a video of the plan for later review, and explain why the plan is important and how it will help achieve the desired outcomes [35].

In sum, Table 1 demonstrates the variety of specific team processes that were either explicitly reported in certain frameworks or inferred based on definitions and concepts provided in the literature. Our critical analysis led us to classify these specific team processes under anywhere from two to twelve broader team processes within each framework. For ease of comparison between frameworks, these broader team processes were then regrouped under the following ten general themes in Table 2: (a) tasks, (b) context, (c) relationships, (d) roles/norms, (e) personal characteristics, (f) team characteristics, (g) goals, (h) communication, (i) cooperation/coordination, and (j) leadership. Tables 1 and 2 show that the frameworks addressing the most general themes and broader team processes include Tuckman's [22,24] group development framework [7 themes; 12 broader team processes], Carron's [14] framework for examining the correlates of cohesion [6 themes; 6 broader team processes], and Carron and colleagues' [9,11,49] conceptual framework of team building [6 themes; 6 broader team processes]. On the other hand, the frameworks addressing the least number of general themes and broader team processes consist of Beauchamp and colleagues' [36] personality-based preference framework for team communication [2 themes; 2 broader team processes] and Carron and colleagues' [41] conceptual model of cohesion [3 themes; 3 broader team processes]. Furthermore, out of the ten general themes, the theme pertaining to roles/norms was the most prevalent one as it was addressed in six out of the seven frameworks. Conversely, goals, cooperation/coordination, and leadership were the least prevalent general themes, only discussed in two of the seven frameworks.

4. Discussion and Concluding Remarks

The purpose of this study was to critically examine frameworks of team processes in sport. In particular, we sought to (a) identify theoretical/conceptual frameworks in the literature addressing one or more team processes relevant for sport, (b) identify the specific team processes directly or indirectly targeted in these frameworks along with outcomes, (c) determine broader team processes and general themes and compare them across frameworks, (d) evaluate the frameworks based on their strengths and limitations, (e) report or infer implications for practice, and (f) make recommendations for future research. Seven frameworks used to guide research and/or practice in sport were identified. While three of the frameworks were borrowed from general psychology, four stemmed from the sport psychology literature. After critically reviewing the seven frameworks, it is apparent that no one framework addresses all specific or broader team processes appearing to be relevant for team functioning and effectiveness. While some frameworks are more comprehensive [14,22,49], others are quite limited [36,41] in terms of the number of team processes and general themes targeted.

The general theme and corresponding team processes that were most often explicitly or implicitly addressed related to roles/norms. Roles/norms were featured in six out of the seven frameworks. Specifically, roles were addressed in five of the seven frameworks, while norms were identified in two frameworks. Roles and norms were grouped together into one general theme as both focus on the specific behaviours required of team members, to fulfill either a position [i.e., roles; 57] or team standards [i.e., norms; 58]. Both dictate how team members will function within the team.

Both roles and norms have been the focus of many studies, however, roles have been more emphasized [8]. Based on the broader team processes that were identified in the current study, several actions including establishing, fulfilling, and adapting were associated with roles. This is consistent with existing research suggesting that role clarity, role acceptance, and role performance are necessary to achieve cohesion and optimal performance [57]. Congruent with recommendations for practice,

roles for each team member must be clearly defined and communicated early in the season [57]. In doing so, practitioners must ensure that each role is accepted and viewed as equally important and valuable to team goal achievement [57,58]. This is especially crucial in high performance sport where athletes do not always receive equal opportunities [e.g., playing time; 57]. Given the recommendation that team building interventions be "developed on the basis of a theoretical understanding or modeling of how things work" [7,60, p. 518], it is not surprising that roles have been one of the most often targeted team processes in sport-based interventions [8].

The general themes of personal and team characteristics were also highlighted in several of the frameworks (N=4 each) included in the present review. Traditionally, personal and team characteristics have been addressed in the literature as *factors* impacting team cohesion [12,14,22,24]; seldom have they been integrated into processes that could be nurtured. For instance, similarities in team members' perceptions, anxiety, and social loafing have been described as personal characteristics associated with cohesion [9,59]. In the current study, only two frameworks [36,49] explicitly highlighted the actions or processes involved in *optimizing* personal or team characteristics. Specifically, Beauchamp and colleagues [36] targeted *personal* characteristics and noted that team members must assess their preferences for interacting and communicating with team members, understand patterns of preferences for each member, and communicate based on these preferences when attempting to enhance team functioning. Carron and colleagues [49] discussed *team* characteristics in their conceptual framework of team building, and highlighted the importance of identifying distinctive team attributes in order to enhance cohesion.

By considering the two aforementioned frameworks [36, 49] and the broader team processes related to personal and team characteristics that emerged from our analysis, it becomes clear that characteristics are not merely fixed attributes that teams have or do not have. Rather, practitioners can intervene by helping team members identify, challenge, communicate, and respect personal and team characteristics. Beauchamp, Jackson, and Lavallee [38] argued that when attempting to build optimally functioning teams, practitioners have two choices: to "select (or deselect) the appropriate personnel to fit the team's needs…[or] to train existing members to more effectively contribute to the team's objectives" [p. 34]. This supports the notion that characteristics can be nurtured by practitioners to achieve desired outcomes.

Another general theme that was commonly addressed in four of the seven frameworks was communication. Our analysis shows that communication is a team process involving both task and social aspects, although most frameworks address only one of these aspects, which is a limitation. Communication has been generally cited as a key team process in the cohesion and team building literature [1,9,32,61]. While it was a prevalent theme in the current study, it is surprising that it was not addressed in all seven frameworks given that it appears to underlie most of the broader team processes. For instance, one could argue that team members must communicate in order to identify and challenge team characteristics, establish relationships, establish roles and norms, and coordinate tasks. This notion was corroborated by Eys and colleagues [57] who stated that "effective communication is a pivotal aspect of effective intervention strategies" (p. 109). As such, practitioners should encourage effective communication while cultivating other team processes.

One of the general themes that was addressed in the least number of frameworks (N=2) pertained to goals. This was unexpected given the amount of research on goal-setting in general and the prevalence of this team process in team building intervention research [7,60,62,63]. Interestingly, goal setting has been the most targeted team building strategy in sport [8] and goal setting interventions have been shown to have the strongest effect size in a recent meta-analysis [7]. This suggests that although goal-setting was not integrated in many frameworks, practitioners should still be mindful of its importance when attempting to enhance team functioning. This finding also supports the argument that some frameworks may not be comprehensive enough to assist practitioners in their work with teams.

As evidenced in Table 1, cohesion was the most prevalent outcome addressed in the seven frameworks (N=4). This confirms what is advocated in the general sport psychology literature that cohesion is the most popular topic studied and/or targeted in relation to teams [1,7,8]. However, McEwen and Beauchamp [1] have suggested that "there is more to being an effective team than merely being a cohesive one" [p. 233], and that team cohesiveness is not synonymous with team effectiveness. In fact, athletes have identified that high levels of cohesion can actually *hinder* team performance [e.g., by creating communication difficulties; 64]. As noted by Bruner and colleagues, "the restricted focus on cohesion suggests that research conducted within the area of team building in sport is relatively narrow" [65, p. 37]. Consequently, McEwan and Beauchamp [1] advocated that applied researchers, and arguably practitioners, should focus on specific team processes (e.g., setting goals, communicating, monitoring performance, problem solving) that may contribute to enhanced team functioning.

Given that team processes have been linked to various positive outcomes in the literature, there is a need to facilitate knowledge transfer in order to help practitioners use empirical findings when working with teams. Our analysis enabled us to provide examples of applications for each theoretical or conceptual framework included in this study. However, this applied information was not forthcoming and it was limited in certain frameworks given the narrow focus of these frameworks. Also, there appears to be a disconnect between constructs presented in different publications of the same frameworks [e.g., goals were not included in earlier publications of Carron and colleagues' framework of team building but were so in later publications, see 9,11,49]. Researchers must thus invest more effort into providing concrete guidelines to not only help practitioners build effective teams in their practice, but also guide researchers attempting to use frameworks in intervention studies and report

applicable findings. Further, additional research is required to advance more comprehensive "how to" frameworks that will visibly assist practitioners and researchers in optimizing essential team processes in sport.

It is noteworthy that frameworks can be developed using a 'top-down' (e.g., theory is developed based on a review of existing literature) or 'bottom-up' (i.e., theory is grounded in the experiences of the participants under study) approach. One conceptual framework that has been recently generated using a 'top-down' approach is that of McEwan and Beauchamp [1]. This multidimensional framework of teamwork in sport was predominantly drawn from the organizational psychology literature. Although it has yet to be tested and used in sport psychology research, it shows great promise given its emphasis on a variety of teamwork behaviours (i.e., team processes) that can be nurtured over time and across contexts. Some of these behaviours were not addressed in any of the seven frameworks included in this study (e.g., systems and performance monitoring, problem solving, support). While specific practical implications of this framework have not been provided at this point in the literature, various examples of inputs, team processes, and outcomes give insight into the future applicability of this framework to enhance team functioning and effectiveness in sport.

There is also value in considering 'bottom-up' approaches when developing evidenced-based frameworks. For example, it would appear to be important for scholars to immerse themselves 'in the field' to gather data directly from groups or teams to get their perceptions of what they require from practitioners and leaders to develop and optimize team processes. This is of particular relevance given that all of the frameworks presented in this study appear to have been deductively developed based on literature reviews and/or a limited empirical database. For example, a grounded theory approach with which data are collected from participants who have experienced the processes, actions, or interactions under study [66], may help uncover team processes that were not explicitly or extensively addressed in the existing frameworks. This approach would also lend itself well to obtaining a more comprehensive account of a variety of team processes deemed necessary for optimal functioning in a particular context. More specific applied strategies linked to these team processes could be examined as well in order to provide concrete empirical data to guide practitioners. Congruent with a grounded theory approach, the data could ultimately lead to the development of a sound theory on the use and application of team processes that could inform practice as well as future research. It is our hope that this review will be a springboard for studies in this area.

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Article 2

The Optimal Team Functioning (OTF) Model:

A Grounded Theory Framework to Guide Practice in High Performance Curling

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Abstract

The purpose of this study was to investigate factors contributing to the development and maintenance of optimal team processes in high performance curling and postulate a grounded theory model of optimal team functioning. A constructivist grounded theory approach (Charmaz, 2006) was used to collect and analyze the data from focus group and individual interviews conducted with 78 athletes and 10 coaches from 19 high performance curling teams. The methodology led to the creation of the Optimal Team Functioning (OTF) model, which reflects important attributes and processes grouped under eight components: (a) Individual Attributes, (b) Team Attributes, (c) Foundational Process of Communication, (d) Structural Team Processes, (e) Individual Regulation Processes, (f) Team Regulation Processes, (g) Context, and (h) Desired Outcomes. Each component of the OTF model is discussed, relationships between the components are addressed, and recommendations for the application of the model are provided.

Keywords: sport psychology, team dynamics, team processes, grounded theory, high performance, curling, athletes, coaches

The Optimal Team Functioning (OTF) Model:
A Grounded Theory Framework to Guide Practice in High Performance Curling

Introduction

A commonly referenced phenomenon in the sport literature is one in which a team comprised of a number of talented athletes is unable to successfully perform while another team with lesser talent is able to exceed expectations. It can be argued that this may largely be a result of team dynamics and processes. The purpose of this study was to use a grounded theory approach to investigate factors contributing to the development and maintenance of optimal team functioning in the particular sport of curling, with a specific focus on identifying team processes deemed necessary by athletes and coaches experiencing them in the field to excel at a high level in curling. In this context, team functioning referred to the processes by which team members worked together and operated on a day-to-day basis in order to perform specific actions or tasks. Optimal team functioning denoted the best or most favourable way that team members worked together.

A review of the literature showed that to date, the vast majority of group dynamics research in sport has pertained to the concepts of team cohesion and team building (Collins & Durand-Bush, 2015). While group dynamics concern "the influential actions, processes, and changes within and between groups over time" (Forsyth, 2010, p. 2), team cohesion involves a "dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (Carron, Brawley, & Widmeyer, 1998, p. 213). In Prapavessis, Carron, and Spink's (1996) team building model, cohesion is the output (or product) of input and throughput factors. The two input factors, that is, the team environment (e.g., proximity and distinctiveness) and

team structure (e.g., team norms, roles, and leadership), affect the throughput of team processes, which in turn directly impact the team's level of cohesion.

Team processes, which are highlighted in both Forsyth's (2010) definition of group dynamics and Prapavessis and colleagues' (1996) team building model, refer to multiple actions that assist teams in converting initial resources into shared performances (Hardy & Crace, 1997). In the context of sport, these processes typically include communication, interaction, cooperation, and team goal-setting (Carron, Hausenblas, & Eys, 2005). Thus far, a number of theoretical models or frameworks have been put forth to explain such processes and have been used to conduct research in the field. For instance, early researchers borrowed (e.g., Steiner, 1972; Tuckman, 1965) or adapted (e.g., Beauchamp, Maclachlan, & Lothian, 2005; Eccles & Tenenbaum, 2004) frameworks from general psychology in response to the absence of frameworks developed and validated for use in sport. Scholars also proposed sport and exercise-specific models (e.g., Carron, 1982; Carron, Widmeyer, & Brawley, 1985; Prapavessis et al., 1996). That said, the aforementioned frameworks have focused predominantly on team cohesion and/or only a few elements of group dynamics (e.g., communication, roles/norms) and may therefore not be comprehensive enough to fully understand team processes in a particular sport. Moreover, aside from Prapavessis and colleagues' team building framework, the application of team processes has not been particularly addressed in these frameworks (Brawley, 1990; Collins & Durand-Bush, 2015; Loughead & Hardy, 2006). Consequently, they provide little insight into *how* to nurture optimal team functioning. Finally, several of these frameworks have not been grounded in actual team experiences, that is, they were deductively developed based on a literature review, and furthermore, they have not been extensively validated (see Collins & Durand-Bush, 2015 for a review).

McEwan and Beauchamp (2014) recently proposed a framework for teamwork and team effectiveness in sport based on research from organizational psychology. Of particular relevance is the emphasis they placed on various team processes (i.e., teamwork behaviours), which consist of two components: (a) the management of team maintenance (i.e., psychological support, integrative conflict management), and (b) the regulation of performance (i.e., preparation, execution, evaluation, adjustments). These teamwork behaviours correspond with many of those referenced in the sport psychology literature (e.g., setting team goals, communicating task-relevant information, solving problems). As such, McEwan and Beauchamp's (2014) model increases our understanding of what characterizes optimal team functioning. There are nonetheless limitations, for example, the framework was developed using a top-down (e.g., based on non-sport related theory) as opposed to a bottom-up (e.g., based on actual data from sport teams) approach. Also, this framework has not yet been used and/or validated in sport research and practice.

Research in the area of team building has also shed light on team processes in sport. Team building interventions involve using strategies to optimize the group environment, the team's structure, as well as team processes (Loughead & Hardy, 2006). Studies have shown that team building interventions targeting well-cited group processes such as communication and goal-setting can heighten team cohesion and effectiveness (Bloom & Stevens, 2002; Newin, Bloom, & Loughead, 2008; Pain & Harwood, 2009; Senécal, Loughead, & Bloom, 2008; Voight & Callaghan, 2001). Yukelson (2001) recommended that team building interventions promote mutual sharing and understanding whereby team members reciprocally share thoughts and feelings about their experiences in order to enhance team functioning. This was corroborated by Dunn and Holt (2004) who found that a personal-disclosure mutual-sharing team activity with an

ice hockey team led to increased understanding, cohesion, and confidence. In another study, an elite curling team perceived enhanced cohesion and performance as a result of mutual sharing and co-regulation throughout a season (Collins & Durand-Bush, 2010).

A limitation of the aforementioned studies, however, is that most of the interventions were pre-established and thus not tailored to or necessarily representative of the specific needs and actions of each team and sport (i.e., Bloom & Stevens, 2002; Newin et al., 2008; Pain & Harwood, 2009; Senécal et al., 2008). Thus, although valuable knowledge was gained from this research, the actual everyday processes by which different team sport coaches and athletes develop and nurture optimal team processes warrant further investigation.

In sum, it can be argued that in general, optimizing team functioning in sport is an important, albeit complex and challenging task involving several processes. Regrettably, our knowledge of what constitutes optimal team processes, and how these are developed and maintained within specific sports, remains limited. Although theoretical models and frameworks targeting a few or several group processes have been developed, limitations regarding their theoretical foundation, breadth, and/or application have been identified. Collins and Durand-Bush (2015) made a call for grounded theory research in order to provide an in-depth and comprehensive understanding of team processes required for optimal functioning in specific sports. Given that none of the existing models and frameworks have been developed using a grounded theory approach, and none have been tailored to meet the needs of particular sports, this type of inductive research is warranted. By deriving the data from those directly affected by team processes in the field in specified sports, in-depth knowledge is created based on many important implicit meanings and experiences (Charmaz, 2006), and the emerging theory is comprehensive, relevant, sport-specific, and applicable.

Purpose

This study was conducted as part of an overall research initiative of which one of the aims was to employ a grounded theory research approach to examine the factors and strategies contributing to the development and maintenance of optimal team functioning in high performance curling, and the specific roles of coaches in this process. The current article represents the second of a series of four articles. It aims to present the grounded theory model depicting the factors associated with developing and maintaining optimal team functioning within elite curling teams. The first article (Collins & Durand-Bush, 2015) provided a critical review of frameworks of team processes in sport with implications for practitioners. The third article addresses the specific *strategies* used by curling coaches and athletes to develop and maintain optimal team functioning while the fourth one focuses on the unique roles that curling coaches play in this process.

Methods

Constructivist Grounded Theory

Charmaz's (2006) constructivist grounded theory approach was employed in this study. A grounded theory researcher "seeks to construct theory about issues of importance in people's lives" (Mills, Bonner, & Francis, 2006, p. 2). Grounded theory is deemed beneficial when research questions focus on "understanding how individuals experience the process and identifying the steps in the process" (Creswell, 2007, p. 66). Theory is not pre-determined but rather grounded in data systematically collected from participants who have experienced the processes under study (Creswell, 2007). Traditional grounded theory approaches can be considered "silently authored" (Mills et al., 2006, p. 7), with the researcher acting merely as a distant expert as the theory is discovered. Conversely, Charmaz's (2006) more contemporary

approach rests on the assumption that theory is co-created through the interaction between the participants, the researcher, and the social world. Furthermore, methods do not reflect a set of prescriptions, but rather flexible but thorough parameters to guide the research process, within which reflexivity plays a crucial role. What's more, coding focuses on processes and actions, which helps researchers to see processes that may otherwise remain obscure and to establish links between them (Charmaz, 2012). Given the focus of the research questions on team processes, the researcher's active role in data collection and analysis, and the aim to create an action-focused theory that coaches, athletes, and practitioners can apply, Charmaz's (2006) constructivist approach was deemed the most suitable to conduct the current study.

Participants

The participants were selected using theoretical sampling, that is, they were chosen based on their potential contribution to the emergence of the grounded theory (Charmaz, 2006). Curling Canada (CC) endorsed this study and was involved in determining which high performance athletes and coaches should be interviewed in order to get a sufficient and representative sample of Canadian high performance curling teams. High performance was defined by CC as the context in which national-level athletes commit to training year-round and to "exploring learning opportunities that foster the development of knowledge, skills and attitudes required to compete at the national and internationals levels" (CC, 2014). Teams were sampled based on gender, experience, team longevity, and current team ranking based on the Canadian Team Ranking System (CTRS). The CC High Performance Director and National Coaches emailed the recruitment text to the high performance athletes and coaches who were targeted, and those interested followed up to schedule an interview. Due to the iterative process and continuous theoretical sampling, the recruitment process spanned two competitive seasons.

The final sample included 19 high performance curling teams (N = 78 athletes and N = 10 coaches). Of these, seven were men's teams, 12 were women's teams, and the 10 coaches were men. Some teams did not have a coach at the time of data collection, which is not uncommon in high performance curling, and others were unavailable to participate. Given that there are a limited number of teams competing at this level in Canada, no additional information regarding the sample is provided in order to protect anonymity.

The sport of curling was targeted due to its interactive nature and small team size. In curling, a team is comprised of four athletes (i.e., a lead, second, third or vice-skip, and skip), usually a coach, and sometimes an alternate player. The objective of the game is to slide curling stones (i.e., rocks) down a sheet of ice; the team with the rock(s) closet to the centre of a target (i.e., the button in the house) scores point(s) (CC, 2015). In curling, teams are a "bounded unit" (Tamminen & Crocker, 2013, p. 739) as each athlete is required to make each shot - one athlete throws the rock, two athletes sweep it, and one athlete calls the shot. As such, effective team processes are crucial (Collins & Durand-Bush, 2010).

Data Collection and Analysis Process

The data collection and analysis process involved the following eight steps based on eight core characteristics of grounded theory studies (Charmaz, 2006; Holt & Tamminen, 2010): (1) interviewing, (2) data transcription, (3) researcher reflexivity and memo-writing, (4) data coding, (5) multiple coder checking, (6) verification and re-coding of data, (7) model development, and (8) model verification. These characteristics capture "the essence of most variants of the [grounded theory] methodology" (Holt & Tamminen, 2010, p. 407). Each of the characteristics, as they pertain to the present study and the constructivist variant of grounded theory, will be discussed next.

It must be noted that although the data collection and analysis process is presented here as 'steps', it was iterative and dynamic and was not conducted in a linear fashion (Charmaz, 2006; Creswell, 2007). There was interplay between the theoretical sampling of participants, data collection, and data analysis. For example, the researcher conducted focus group and individual interviews, engaged in brief memo-writing, transcribed data, after which she conducted more interviews with further memo-writing and data transcription, and so on.

Interviews. The data were collected via (a) face-to-face focus group interviews with each team of athletes, and (b) individual telephone interviews with coaches. Given that the research questions targeted team processes, focus group interviews with intact teams were deemed the most beneficial to allow the athletes, who had common interests and goals, to interact and discuss amongst each other while responding to questions (Creswell, 2007). As Gibbs (1997) noted, often, "attitudes, feelings, and beliefs may be partially independent of a group or its social setting, but are more likely to be revealed via the social gathering and the interaction which being in a focus group entails." Consequently, it was believed that by interacting and discussing various topics (e.g., a strategy used in response to a team obstacle), team members would be able to share their thoughts and feelings, respectfully challenge one another, and "re-evaluate and reconsider their own understandings of their specific experiences" (Gibbs, 1997). This process contributes to multiple perceptions and explanations (Gibbs, 1997), and thus rich and comprehensive data.

The coaches were not present during the focus group interviews in order to enable the athletes to openly and honestly discuss the role of the coach in developing and maintaining optimal team processes. Instead, interviews were conducted separately with each coach to investigate their perceptions and experiences.

Face-to-face focus group interviews with athletes. The interviews were conducted in person at several competitions and training camps based on sampling needs (e.g., need more men's teams) and availability (e.g., could only interview five teams based on competition schedule). Each team was comprised of four or five athletes. The interviews were based on an interview guide consisting of 12 broad open-ended questions with corresponding probes. The interview questions focused on identifying: a) key factors contributing to the development and maintenance of optimal team functioning (e.g., what contributes to optimal team functioning within your team?), b) strategies used to develop and maintain optimal team functioning (e.g., can you provide some specific examples of strategies that you and your coach use to facilitate team functioning, particularly in response to challenges, setbacks, or obstacles?), and c) roles of the coach in optimizing team processes within the team (e.g., how does your coach help or hinder your ability to work and interact effectively with one another?). The aim was to capture the team's responses (i.e., content), not their interactions during the discussion (e.g., body language, tone of voice). However, the lead researcher's observation of the team's non-verbal communication led her to probe in certain instances. For example, if a team member was withdrawn and avoided eye contact with teammates while discussing an issue, the researcher carefully reflected back the member's obvious discomfort to get her to further elaborate. The researcher also directed the interviews to ensure that each team member contributed to the discussion. The interviews were audio recorded and lasted, on average, 65 minutes. Procedures for the athletes involved completing the consent form and a brief demographic questionnaire, engaging in a group discussion led by the researcher based on the interview guide, and completing an exit questionnaire (i.e., provided level of agreement with what was discussed and additional information in confidentiality).

Individual telephone interviews with coaches. After conducting the focus group interview with a particular team, the researcher emailed the coach to ask him to participate. The reasoning for this order was twofold. First, it was challenging to secure a focus group interview with an entire team at an event where opportunities were limited, thus it was deemed strategic to interview the team first. Second, data from the focus group interview informed questions and probes relating to the coach's involvement on that particular team.

Coaches were emailed the consent form and the demographic questionnaire, which they completed and returned electronically prior to the interview. The researcher used a similar interview guide but used the knowledge from the focus group interviews to probe for specific processes, strategies, and roles. Given the coaches' limited availability, the interviews were conducted over the telephone and lasted, on average, 85 minutes. In contrast to the athletes, the coaches were not asked to complete an exit questionnaire since there was no one else present to influence what they shared. Given that the interviews were over the telephone, efforts were made to establish rapport with the coaches first, which likely contributed to their willingness to share both their strengths and weaknesses.

Prior to starting data collection, the CC High Performance Director and a National Coach authenticated the interview guides and only minor changes were suggested (e.g., added sport-specific probes). Furthermore, the researcher conducted a pilot focus group interview with a curling team and an individual interview with the team's coach, and debriefed the process with the thesis supervisor.

Data transcription. In total, 29 interviews were conducted and transcribed verbatim, and participants were identified using an ID number. During transcription, the researcher noted follow-up questions. With the participants' consent, she emailed each athlete the team's

interview transcript and each coach his transcript for verification, and only minimal changes were suggested and made. In line with the iterative process, the researcher also included follow-up questions to which many participants provided responses, which were then integrated into the data (Charmaz, 2014).

Researcher reflexivity and memo-writing. As the interviews were conducted, transcribed, and analyzed over the two-year time span, reflection and memo-writing took place. The researcher reflected on the data and made notes on: a) different ways to ask questions and additional probes to use during the following interviews to elicit clear and thorough responses, b) initial codes emerging from the data, and c) ways to conceptualize the coding tree and categorize the data. This facilitated the iterative process in which the data were constantly compared and contrasted (Charmaz, 2006). Although some interviews were conducted consecutively at a training camp or competitive event and formal data transcription and analysis could not take place in between interviews, the content provided in these interviews was considered by the researcher to further probe in subsequent ones. This constituted a form of iteration as it allowed the researcher to use comparison and go "back and forth between data and analysis" (Charmaz, 2014, p. 11).

Data coding. Data were analyzed throughout the process using Charmaz's (2006) recommended procedures. Each interview transcript was first broken down into pieces of text (i.e., meaning units) that were then coded based on the content. During the early stages of analysis, coding was informed by numerous discussions between the researcher and supervisor in order to determine how to best represent the data. In order to enhance the trustworthiness of the process, each of the emerging codes relating to team processes were defined [e.g., prepare – to make ready or suitable in advance for a particular purpose]. The definition of each of these codes

was adapted and refined throughout the analysis process in order to best represent the data and the way they were categorized. Concurrently to defining emerging codes, all of the data (i.e., meaning units) were categorized based on the different order codes that naturally emerged from the data, research questions, and interview guides, and a coding tree was generated.

As the data were compared and contrasted, new codes were added, some second, third, fourth and fifth-order codes were modified and shifted in the coding tree, as were some of the data categorized under these codes. In the end, all of the transcribed data were analyzed three times (i.e., initially, during multiple coder checks, and during verification and re-coding; see below) and the data coding tree was revised 16 times to accurately reflect the data and codes. Furthermore, theoretical saturation was reached (Charmaz, 2006); for example, by sampling in order to develop and refine the categories (e.g., men's and women's teams, newly formed and well established teams, teams with and without coaches, diverse standings in the CTRS), eventually no new first and second-order codes were added in the latter half of the coding process. Only some select third, fourth, or fifth-order codes were created to account for details and examples.

Multiple coder checks. Multiple coder checks were performed. First, throughout the data analysis process, the researcher and supervisor met regularly in order to discuss the evolution of the coding tree and work through any uncertainties when coding the meaning units. This allowed the researcher to engage in critical reflection throughout the process. Second, once the data were fully analyzed, two doctoral students independently coded a representative sample of meaning units using the coding tree. Both doctoral students were colleagues of the lead researcher, neither whom had extensive knowledge in the area of team dynamics, thus they provided diverse perspectives. Consistent with the view that there are "multiple individual realities" (Mills et al.,

2006b, p. 2), the aim of multiple coding was to encourage the lead researcher to delve even deeper into the data and consider alternative possibilities. As stated by Barbour (2001):

> What is ultimately of value is the content of disagreements and the insights that discussion can provide for refining coding frames. The greatest potential of multiple coding lies in its capacity to furnish alternative interpretations and thereby to act as the "devil's advocate" implied in many of the checklists in alerting researchers to all potentially competing explanations (p. 1116).

Discrepancies were noted and discussed in terms of how the data could best be coded.

Verification and re-coding. Following the multiple coder checks, the researcher re-read each of the 29 transcripts to review, meaning unit by meaning unit, the coding performed in earlier data analysis phases in order to ensure accuracy and consistency. Some changes were made to reflect new third, fourth, or fifth-order codes that were created later in the analysis and to modify some of the coded meaning units as a result of discussions with the doctoral students. The researcher thus reflected on, analyzed, and compared every single meaning unit several times during the data analysis process, which was important because the coding tree evolved. Finally, data were entered into NVivo 10, a software program for qualitative data analysis, to facilitate data organization and retrieval. Some additional memos were also made at this point in the process.

Model development. According to Charmaz (2006), diagramming is valuable for visually illustrating components and relationships that represent the data. As such, in this step, the researcher and supervisor developed the theoretical model, which eventually resulted in Figure 1 below. They explored, through constant comparison, the 21-second order codes related to factors in an effort to group them into broader components for the model. For example, a

series of codes pertaining to beliefs and attributes of individual members (e.g., self-efficacy, personality, skill) were grouped in the model under "individual attributes". As components were created, these too were contrasted and compared in order to ensure that they best regrouped the data, and relationships between components were accurately depicted.

Model verification. Once the researchers were satisfied with the model, they presented it to a panel of experts in order to further scrutinize it (Charmaz, 2006). The expert panel was comprised of six individuals: the CC High Performance Director, a high performance athlete and coach who participated in the study, an expert researcher in coaching and team building, a mental performance consultant working with high performance curlers, and a doctoral student. Each panel member was emailed the purpose of the study, a copy of the model, and a detailed explanation of it. They were asked to critically reflect on the model and answer questions such as "Is the model easy to understand and interpret?" "Is it representative of team processes involved in curling?" "Is it presented and discussed in a way that coaches and athletes will be able to use it?" The members emailed their comments, after which a 2-hour group meeting was held to further discuss the model and provide feedback. The final version of the theoretical model was then created (see Figure 1).

Results

The OTF model depicted in Figure 1 includes key attributes and processes deemed necessary by high performance curling coaches and athletes for optimal functioning within different contexts. The model comprises the following eight components: (a) Individual Attributes, (b) Team Attributes, (c) Foundational Process of Communication, (d) Structural Team Processes, (e) Individual Regulation Processes, (f) Team Regulation Processes, (g) Context, and (h) Desired Outcomes. The first six components make up the core of the model, and

comprise a total of four attributes (e.g., personal characteristics, team sport competencies and characteristics) and 17 processes (e.g., communicate, establish roles, adapt, cooperate). The remaining two components represent peripheral components that reciprocally impact the core of the model. In the following section, each component of the OTF model will be defined and explained based on the coaches and athletes' accounts. Furthermore, examples and citations supporting the data and the reciprocal relationships in the model will be provided.

Individual and Team Attributes

Individual attributes consisted of the individual physical, mental, emotional, and social characteristics of each member of the team (e.g., level of motivation and confidence), as well as their individual sport competencies and characteristics (e.g., technical ability). As the next citation illustrates, when a team was formed, members brought with them a number of individual and team attributes with which teams had to work: "[You've got to] work with what you've got, too! You're not going to change people or make them who you want them to be. It's working with what we are" (M7-2).

Team attributes, in contrast, pertained to relationship characteristics, that is, the connections or feelings between team members (e.g., respect and trust). They also constituted team sport competencies and characteristics (e.g., team tactics). For instance, one coach noted that to function optimally, team members need to not only be technically skilled but also have *similarities* in their skills: "In curling, it's very important that you try to all throw as similar as possible, and there are some differences there...things that we need to work on, but there's nothing there that we can't handle" (C2). As shown in the next citation, individual and team attributes were interconnected: "When he [coach] tells you something technical…you're just like, 'okay, you know what you're talking about.' You just get so confident in him that it's like,

'I can trust him to take me…to the next level'" (W11-1). In this case, the team reported that since their coach was so experienced (i.e., individual attribute), the team trusted him (i.e., team attribute) and felt he would make a valuable contribution to the team.

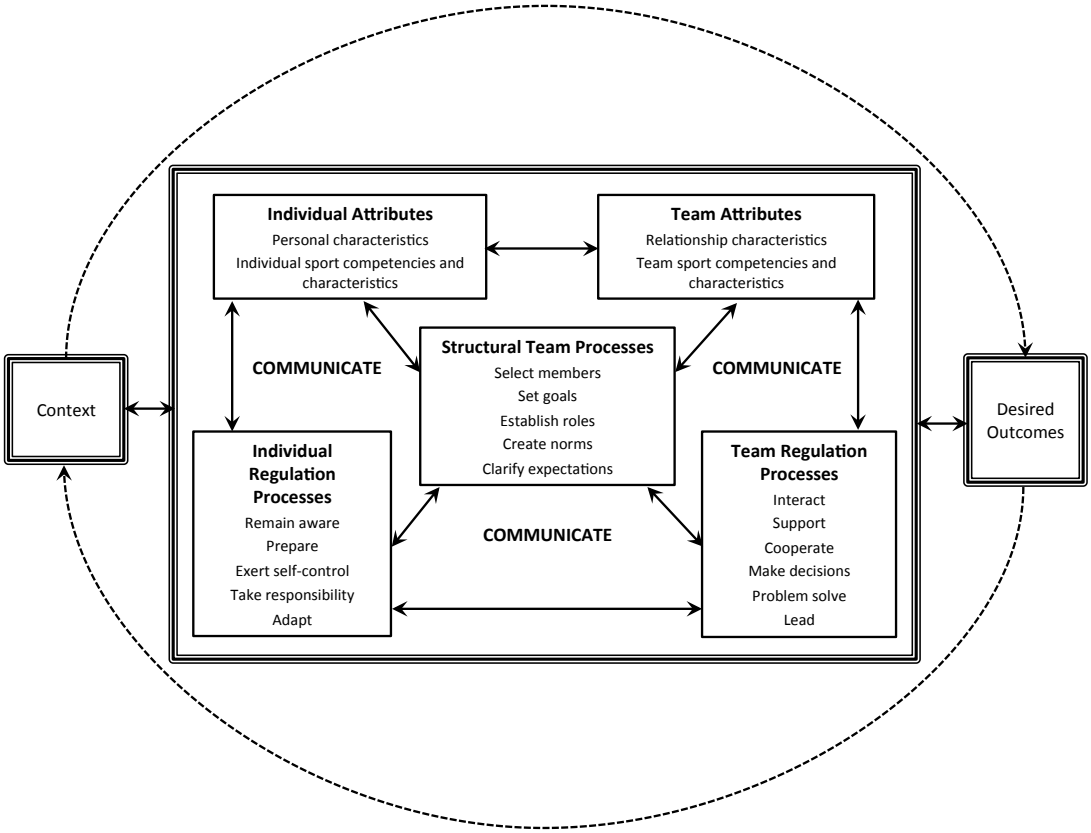

Figure 1. The Optimal Team Functioning (OTF) Model

Foundational Process of Communication

Communication is the foundational process in the OTF model as it was at the core of most processes. It represented actions involving the exchange of information, thoughts, or messages using speech, visuals, signals, writing, and/or behaviour. Communication stood apart for two reasons. First, it was the most referenced and discussed component by both coaches and athletes in the study. As an example, one coach stated that "a healthy team dynamic [is] when the conversations are positive and productive" (C10). Secondly, communication is involved in all structural team processes and team regulation processes, as well as some individual regulation

processes. It is also directly associated with individual and team attributes, and impacts both the context and the team's desired outcomes (i.e., general desired/expected result of team processes and actions including optimal team functioning and performance, and other possible outcomes such as peak cohesion and positive experiences). For instance, one team reported:

> We're comfortable [enough] with one another that we can say…'Can you shut…up?!'…. We're very open and sometimes that hinders us, but it's one of the things that has allowed us to grow quickly as a team and be close and be able to win even when things aren't going well. (M5-2)

In this case, being comfortable with one another (i.e., team attribute) facilitated open communication, which further improved the team's relationships (i.e., team attribute) and helped them to be successful (i.e., desired outcome).

Structural Team Processes

Individual and team attributes and the foundational team process of communication played a fundamental role in structural team processes. Four structural team processes emerged from the data, which refer to actions contributing to the formation of a team: (a) Select team members, (b) Set goals, (c) Establish roles, (d) Create norms, and (e) Clarify expectations. Although these five team processes influence each other and are presented following a logical order of implementation, they may not always occur in a linear fashion. For example, one team skip reported that although goals are typically set after a team is formed, goal-setting occasionally occurs first:

> Sometimes you need to know your goals before selecting team members. For example, is the team driven by a goal to win Nationals or a goal for team cohesion or fun? These

different goals will impact the traits most important in a teammate and therefore impact the selection of team members. (W8-4)

Select members. The process of selecting members involved choosing individuals, in preference to others. Although the OTF model predominantly constitutes actions geared towards the functioning of formed teams, both coaches and athletes reported that a team has to be created at some point and the process of selecting members is a critical one. The next citation illustrates how the selection process is contingent upon the other components of the model, including individual and team attributes (e.g., skills, personalities, relationships). In reference to his new team member, one skip noted: "If he was a hot-head, we probably wouldn't have picked him no matter how good he [is]" (M4-4). Teams were dynamic and even once they were formed, line-up changes sometimes had to be made based on goals, limitations, or incompatibilities that were discovered. One coach demonstrated this when he described the dissolution of his previous team: "When teams dissipate, it isn't necessarily about skills, it isn't even always attitude, sometimes it's just what happens outside of the sphere of the team. And I think there was a combination of all of these in this case" (C2). According to the participants, teams should be made up of members who help contribute to the realization of goals (e.g., build a defensive team) and desired outcomes (e.g., achieve success): "[You] pick someone who has similar goals, similar drive, similar personality" (M5-4). This sometimes involved changing positions before replacing a player: "[Him and I] dropped down…because we want to win! A lot of players won't do that. [They think] 'okay well, it looks like we're going to have to go get another guy to play lead'" (M5-1).

Set goals. Setting goals was another key structural team process that consisted of establishing objectives for different contexts (e.g., training, competition, administration) in order

to achieve desired outcomes. To optimally function, coaches and athletes indicated that team members had to take time early on (e.g., summer during the off-season, during team formation) to communicate what they collectively and individually wanted to achieve based on strengths and weaknesses, in other words, individual and team attributes: "We have to do reality checks…if we want to compete for a Canadian championship or a shot to go to the Olympics, this is what it's going to take, right?!" (C3). Goals reflected long-term, short-term, and daily concrete actions targeting various attributes and processes. For example, one team shared: "We're all in the gym, we're all eating right, we're all coming to the event ready, we're all getting enough sleep during the event. We're doing the things we have to [do]" (M5-3). As illustrated in the next citation, it was vital that goals be revisited and modified as necessary throughout the season since changes related to other components of the OTF, such as individual and team attributes, could lead to incongruence within a team. One coach noted that they should have modified their goals after losing a few experienced and highly skilled team members:

> After the team broke up and changed a few [players]…I don't think the team was at the same level but yet the goal remained the same, and I think that was a mistake on my part and on the team's part when we were setting goals. (C9)

Establish roles. A third structural team process concerned establishing roles. Determining the role that each team member (i.e., athletes and coach) played in order to achieve set goals and desired outcomes was perceived to be important. Participants mentioned that roles could be formal (i.e., officially negotiated and communicated) or informal (i.e., inherently assumed or naturally adopted), involve diverse tasks (e.g., talk to the skip after a missed shot, facilitate a post-game debrief), and relate to different contexts such as training (e.g., plan and run practices), competition (e.g., scout opponents), and administration (e.g., book hotels). Also, roles

were defined and clearly communicated early on in the season or when a new member joined a team, and were based on individual and team attributes, goals, and desired outcomes. One coach noted:

> It will always create dynamic problems within a team [if] one person does all the work. Or even if three people do all the work and the other person does nothing…. You need to share those things.… You need to have identified roles on the team. (C4)

However, it is noteworthy that as a season progressed, roles sometimes had to be adjusted for various reasons (e.g., conflict, preferences). For instance, one skip was having difficulty controlling her emotions, which negatively impacted the team, thus her coach suggested that the third call the game: "I think when she suggested the switch-up, she was trying to prevent a break-up!" (W2-4).

Create norms. Norms were created based on a team's collective beliefs about how teammates should behave in different contexts. This required discussing behaviours that were consistent and inconsistent with the team's identity, values, goals, and desired outcomes. An example of a norm for one of the men's teams was to "look like a professional team.... Part of our identity was [to] come into the rink together at the same time before every game...get out on the ice and do our routine" (M7-4).

Clarify expectations. Lastly, in addition to creating norms, coaches and athletes reported that they must clarify and communicate expectations: "We can't all silently have our own expectations, we need to be clear about what they are" (C6). Unlike norms, which referred to shared collective beliefs, expectations were individual beliefs regarding what could happen, or what members hoped would happen in different contexts. For example, one coach explained that the norm for a particular team was to stretch before a game, however, individual expectations

regarding how to stretch and for how long varied among teammates: “Everybody does the routine, but not everybody needs it in the same way. But some people need to see everybody doing it, otherwise they don’t feel like the whole team is prepared” (C5).

Individual Regulation Processes

Unlike structural team processes, which were periodically addressed throughout a competitive season, coaches and athletes reported engaging in individual regulation processes on a more daily basis. Individual regulation referred to actions contributing to the routine functioning and activities of an individual team member in varying contexts. Dynamic and interconnected with all other aspects of the model, individual regulation processes included: (a) Remain aware, (b) Prepare, (c) Exert self-control, (d) Take responsibility, and (e) Adapt.

Remain aware. The process of remaining aware was fundamental as it allowed individual team members to be conscious of their internal states as well as their external environment (e.g., people, objects, events). As a coach discussed, awareness of both the self and others was important: “The knowledge that [team members] have about how the things they do impacts their teammates and the knowledge of the things that their teammates do or could do differently that impacts them individually” (C3). Awareness also meant recognizing what one personally required for optimal functioning (e.g., take a deep breath when getting into the hack), as well as what teammates necessitated (e.g., give a teammate space after a missed shot). One athlete referred to this when she said, “It [would] be amazing if people on a team had enough self-awareness to say, ‘[Athlete], the feedback you’re giving me…I’m overwhelmed, I can’t take it anymore, I just need positive [feedback]’” (W5-4).

Prepare. With full awareness, athletes and coaches could effectively prepare to achieve set goals and contribute to eventual desired outcomes. This meant engaging in actions to get

ready for a particular task, situation, or event, which could have physical, mental, emotional, social, and/or organizational dimensions. For example, one team went to the gym every morning while on the road (e.g., physical; M5-3). In another case, one coach facilitated visualization exercises to help his athletes feel confident and motivated before an important event (e.g., mental / emotional; C10). Another team met for a glass of wine with teammates after a game to unwind and prepare for the next day (e.g., social; W10-3). Finally, one mom strategically planned to be able to attend a curling event: "I need three days off. I have to have babysitters, I have to have meals…. I need to have all of this done so when I walk out my front door, I don't have to worry about home" (e.g., organizational; W4-1).

Exert self-control. Exerting self-control reflected an individual team member's conscious or unconscious effort to regulate his thoughts, feelings, and behaviours across varying situations and contexts. It was influenced by awareness, preparation, and other components of the OTF model. For example, one athlete noted that regardless of the outcome in a game situation, it was important for individual members to stay consistent and calm: "That's something that we're really trying to work on – bringing all that together so that when we're winning and we're losing, it's the same sort of feel" (M1-3). In another instance, a skip shared that when she became frustrated, her self-control strategy was to "put on my poker face" (W2-4), which allowed her to regain composure and avoid negatively impacting her teammates.

Take responsibility. Another essential individual regulation process involved taking responsibility. Participants shared that team members had to be accountable and take ownership of their personal actions in order for the team to optimally function:

> Everyone's going to make mistakes. If I throw a rock and they mis-sweep it…that sucks, [but] they didn't mean to. So as long as they take ownership for it then I'm not mad. I would only be mad if they tried to act like it wasn't their fault. (W3-4)

Taking responsibility impacted the other components in the model. For example, one coach noted how not acknowledging mistakes could affect team cooperation (i.e., team regulation process) and goal achievement (i.e., make shots):

> As soon as there's a miss, if there's silence, it's like saying, 'I did nothing wrong'…. [But] something went wrong!... You want to hear 'sorry' every once in a while after a miss so you can figure out what…happened so you can make the next [shot]. (C10)

Adapt. Team members also had to be able to adapt as learning occurred and contexts and situations evolved. One athlete stressed: "The top teams are going to win...a championship once every 3 years maybe? That's the cream of the crop so you'd better learn how to adapt and overcome [adversity]" (M2-3). With awareness and reflection, they could determine when they had to change aspects of themselves and their environment to suit existing or new tasks. As seen in the next citation, this capacity to adapt influenced the other components of the model:

> If someone's not playing very well, and she's able to admit that to the team and [ask], 'Okay, what are we going to do? Like, give me less draws or give me less hits'…that sometimes really helps.… [Also] talking about the ice and trying to figure it out together as a team. (W10-4)

In this case, the skip noted the importance of adapting her team tactics (i.e., team attribute) in order to respond to a struggling teammate (i.e., individual attribute) and difficult ice conditions (i.e., context).

While individual regulation processes had a reciprocal relationship with all components of the OTF model, some processes could be enacted without the foundational process of communication. For instance, one player was able to regulate herself (i.e., exert self-control) in frustrating situations (i.e., context) without the help of teammates (i.e., foundational process of communication) because she invested considerable time and energy preparing to perform (i.e., prepare): "I do a lot of self-talk - I have some key words that I sometimes bring up when I...start to get on the downhill" (W2-4).

Team Regulation Processes

In addition to engaging in ongoing individual regulation processes, coaches and athletes shared that they also had to be able to regulate interpersonal processes in order to achieve set goals and desired outcomes. The following six team regulation processes emerged from the data and are presented from the least to the most complex and influential actions: (a) Interact, (b) Support, (c) Cooperate, (d) Make decisions, (e) Problem solve, and (f) Lead.

Interact. Interacting was the most basic team regulation process, which allowed team members to come together to have an effect on each other. It was facilitated by verbal and/or non-verbal communication and was intentional or unintentional. For example, one team shared that they went "boating…. [To get to] know a little bit more about each of us" (W11-3). Teams had different preferences and tendencies regarding their level of interaction on and off the ice based on individual and team attributes. One skip noted: "We've played together for a long time so she reads my body language, and she'll just come down…. [And] stand beside me" (W7-4). In this case, interaction was contingent upon them knowing each other well (i.e., team attribute) and being aware (i.e., individual regulation process). In addition to being linked to other components of the model, interaction formed the base for all subsequent team regulation processes.

Support. Support was a team regulation process in which team members not only interacted but also assisted one another. Coaches and athletes discussed that they could support one another by providing help and/or by showing empathy. Support was not necessarily a reciprocal process as a teammate could support another teammate without receiving any support in return, however, it was impacted by other components of the OTF model. For example, one skip declared:

> I'd like to see us meet more in between ends…to go over [things] and get everybody on the same page.… I think that would also help us learn about each other a little bit too…you'll see where people are mentally and go from there if somebody needs something. Because I wouldn't notice it under the current system that we have right now. I might not notice that [you are] upset or need some input from me somehow. (M7-4)

In this example, an experienced skip (i.e., individual attribute) recognized the value of teammates getting to know each other (i.e., team attribute) and therefore encouraged his team to communicate between ends (i.e., foundational process of communication) to provide support (i.e., team regulation process) as needed.

Cooperate. Team members cooperated when they *reciprocally worked* with one or more members to accomplish a task, or acted in a way that made it possible to achieve set goals and desired outcomes. Participants reported that cooperation entailed sharing information (e.g., ice conditions) and resources (e.g., technical coach). For example, one team recalled competing in a Championship where the ice was challenging: "We had a good talk...[and] it helped when all of us got together and shared the information" (W10-2). They explained that team members worked together to judge the weight and line of the rocks by communicating (i.e., foundational process of communication) relevant information about the ice conditions (i.e., context). This forced them

to change their expectations (i.e., structural team process): “We can’t be perfectionists on tricky ice” (W10-3).

Make decisions. Making decisions was the fourth team regulation process, which involved one or more team members selecting an action from amongst alternative possibilities. One coach noted that he, along with the skip, created a game plan to facilitate on-ice decisions:

> [Skip] wants to play very aggressive…but I recognize[d] it right away that the team…wasn’t consistent enough to play the aggressive style that the men play. So that’s one of the things that we work on…making sure that they stick with the game plan and focus on it. (C8)

Decision-making was linked with other aspects of the OTF model. For instance, one athlete stated that when determining on-ice roles (i.e., establish roles), “there was a lot of discussion…. Just different pros and cons, and we were just trying to make the most out of every single player and the strengths, as well as who is able to work with who” (W4-4). This illustrated how individual and team attributes were factored into the decisions the team made.

Problem solve. Solving problems was a team regulation process that included decision-making. While team members could make decisions in the absence of problems, problem solving involved identifying, deciding on, and implementing solutions, based on alternatives, to overcome an obstacle (e.g., conflict between team members, bad rocks during a game). Participants’ accounts showed that similar to making decisions, problem solving was contingent upon effective communication (i.e., foundational process of communication) and linked to the other components of the OTF model. For example, one athlete reported that in response to a problem with his previous team, he established a step-by-step plan to address potential issues with his current team: “Lay out the facts, and then...discuss them. Where you do [this] is

critical…. Speak for yourself, talk about the facts, not judgments…. Then...talk about how you feel…then 'what do you think?' And then...talk about solutions with that player" (M3-4).

Lead. The final team regulation process constituted leading, which is when the athletes or coach guided and directed other members of the team. It was not necessary to have only one leader per team as different members could fulfill various leadership roles in different contexts or situations (e.g., on-ice versus off-ice) based on strengths, weaknesses, and preferences (i.e., individual and team attributes): "Everybody's got to be able to pick each other up and that's the way I see…being a leader. You're helping your guys out even if you're struggling. You're helping them out at the same time and leading by example" (M2-4). In another instance, one coach talked about how he had to lead the pre-game routine as all team members were not respecting it and it was upsetting the skip:

> It's one of those things where I didn't want to be part of that, I wanted them to do it as a team…. But certain players, for whatever reason, were falling out of the routine. So it was up to me to say...'okay, everybody do your legs.' (C5)

Context

The context and its elements could have a profound positive or negative impact on individual and team processes and attributes. Context, in this case, referred to the conditions that existed when and where something occurred; it referred to the environment, people, objects, and circumstances associated with particular situations. One coach reported that team functioning could change from training to competition because, "when you're competing, there's less margin for error…. Under pressure, group dynamics can be exaggerated even more so" (C4). Thus, coaches and athletes had to be able to engage in appropriate processes and actions that allowed them to effectively respond to different contexts and situations and also use the context to their

advantage in order to achieve their set goals and desired outcomes. For example, one athlete noted that the pre-game practice was valuable for team members to familiarize themselves with the ice conditions (i.e., context):

> If I see the ice [shake] one way or…doing something specific, I can share that with them and they can confirm that, 'yes, I actually see the ice [doing] the exact same thing' or 'specifically, I noticed this'…. I totally have respect for what every person has experienced in that 10 minutes; it's effective and it's more information going into a game, right? And if it makes one more shot or makes one more half-shot then it's…one shot better. (W4-4)

Desired Outcomes

All of the aforementioned team and individual processes and attributes impacted desired or expected outcomes, the most obvious of which was optimal team functioning, as evidenced by the title of the model. Other related general outcomes pertained to peak cohesion, positive experiences, well-being, and optimal performance. For example, one athlete said:

> When you know you've got good team dynamics and everything's great, it doesn't always mean you're going to perform at your absolute best. But when you've got poor or less than optimal team dynamics, you're guaranteed not to perform at your best. So it's another one of those things that can just kind of bump you up that extra 5...10 percent. (M2-2)

Teams whose members were able to engage in a variety of actions leading them to effectively work together and achieve their set goals in different contexts and situations were in a better position to achieve their desired outcomes. One coach highlighted:

> When the dynamics aren't good, I think there's a lot of pressure...when they feel one missed shot and they're going to be shit on or….somebody's going to turn their back on them…. Whereas you see the good teams who get along great, they miss a shot, and the teammates are still going back and they're patting them on the bum…and they're…'no problem'...'we're going to get the next one.' (C9)

Conversely, when teams had achieved anticipated outcomes, the latter could positively influence other processes and attributes highlighted in the model:

> When people are performing well and...they're getting their share of the breaks, it's much easier for people to play the functional role that they've been given on the ice, and to not let any interpersonal thing get in the way. But I think when it's not going as well, sometimes any little thing that you normally let slide off your back as an athlete begin[s] to bug you a little bit more! (C1)

In sum, the OTF model created in this study highlights the numerous factors involved in developing and maintaining optimal team functioning in high performance curling. It suggests that in order to perform to the best of their capabilities and achieve desired outcomes, coaches and athletes must devote time to (a) recognizing and understanding the context as well as individual and team attributes, (b) establishing sound structural team processes, and (c) engaging in effective daily individual and team regulation processes. However, this cannot be accomplished without developing effective communication, thus this foundational process should be prioritized.

Discussion

The OTF model is a comprehensive theoretical model that was rigorously conceived as a result of an extensive grounded theory investigation with high performance curling athletes and

coaches. The ultimate aim of the model is to help teams address and nurture various processes and attributes in order to optimize functioning and outcomes in curling.

Interestingly, when examining the OTF model in relation to existing frameworks of cohesion and group processes in sport, some similarities can be observed. For example, processes involving setting goals, establishing roles, creating norms, interacting, supporting, cooperating, solving problems, leading, preparing/planning, adapting, and communicating emerged in the OTF model and were also sporadically addressed in other models (Beauchamp et al., 2005; Eccles & Tenenbaum, 2004; McEwan & Beauchamp, 2014; Prapavessis et al., 1996; Tuckman, 1965). In the OTF model, a comprehensive series of interrelated rather than isolated processes required for overall team functioning are evident, which differentiates the OTF model from many existing models that examine only a few explicit team processes (Collins & Durand-Bush, 2015). Based on the data, it is evident that it is essential to consider team processes concomitantly, rather than in isolation, as multiple processes were often used to accomplish one task. For instance, effectively sweeping a rock into the house required considerable verbal and non-verbal communication between all players (i.e., communicate), cooperation between the two sweepers so as not to burn or touch the rock (i.e., cooperate), and quick decision-making on the part of the skip (i.e., decision-making), to name a few. It was also dependent on having the necessary skills (e.g., strength and stamina; individual attributes), as well as a good read on the ice conditions (i.e., context).

Another distinctive aspect of the OTF model is the presentation of a hierarchy of team processes wherein communication forms the foundation of all other processes in the model, and structural team processes help guide individual and team regulation processes. Only two existing frameworks have given emphasis to communication (Beauchamp et al., 2005; Eccles &

Tenenbaum, 2004). However, in comparison to the results of the current study, neither provides an exhaustive account of the reciprocal relationships between communication and other essential team processes, and the impact that these relationships have on optimal team functioning. For example, Beauchamp and colleagues (2005) considered preferences for communication in isolation, and focused almost exclusively on the social aspects of communication, while Eccles and Tenenbaum (2004) directed attention to the task-based communication needed for team coordination. The hierarchy of team processes in the OTF model, wherein communication is the cornerstone, provides coaches, athletes, and practitioners guidance in periodizing their work with teams, and suggests that communication should be made a priority throughout the entire season.

The OTF model also differentiates between periodic (i.e., structural team processes) and ongoing (i.e., individual and team regulation processes) team processes. For instance, structural team processes such as setting goals and norms should be established early on and periodically revisited as needed because they form the structure for ongoing individual and team regulation processes. Although setting goals (Bloom & Stevens, 2002; Senécal et al., 2008; Voight & Callaghan, 2001) and norms (Prapavessis et al., 1996) have been discussed as key team processes in past research, the hierarchical nature of these processes in relation to others has not been particularly addressed in other frameworks. Structural team processes, including the establishment of goals and norms, are at the center of the OTF, which implies that they should be at the forefront when working with teams, even though they may occur more periodically.

Additionally, unique to the OTF model is the emphasis on both the team as an entity and individual team members. While individual factors are recognized in some models as ‘inputs’ contributing to team effectiveness (e.g., McEwan & Beauchamp, 2014), the OTF model is the first to show that aside from individual attributes, a key factor contributing to optimal team

functioning is individual members' self-regulation capacity (i.e., individual regulation processes). Given the reciprocal relationship that emerged between individual regulation processes and all other components in the OTF model, individual self-regulation capacity should be nurtured. The importance of training self-regulation capacity has been highlighted in past research (Cleary & Zimmerman, 2001; Collins & Durand-Bush, 2014; Durand-Bush, McNeill, & Collins, 2015).

When compared with the existing literature, the most valuable aspect of the OTF model is that it is both theoretically grounded in the data and applicable in nature given its strong focus on actions (Charmaz, 2012). Collins and Durand-Bush (2015) called for more research to advance an evidence-based 'how to' framework to guide those involved in sport to manage team processes. Developed based on a representative sample of high performance curling athletes and coaches, as well as an expert panel, the OTF model is a relevant framework demonstrating what it takes for teams to function optimally on a day-to-day basis in the sport of curling. It can be used in a number of ways, for example to: (a) educate team members about the importance of various team processes and attributes, (b) facilitate discussions about what constitutes optimal team functioning within a team, (c) develop individual and collective strategies to achieve optimal team functioning, and (d) foster ongoing reflection.

Although several merits have been discussed, the OTF model and this study bare limitations. First, one of the criticisms of grounded theory research relates to generalizability (Charmaz, 2006). Given that the model was developed based on and for high performance curling, it is not representative of all team sport contexts and levels. Research must be conducted to validate it with other sport populations before any type of generalizations can be made. A second limitation relates to the use of the model. Although processes within the OTF model were

defined and synthesized with optimal application in mind, some coaches and athletes may not feel as though they have the necessary skills to effectively or consistently implement them (e.g., communicate, solve problems). As such, the successful application of the OTF model will be dependent on the competencies of coaches, athletes, and practitioners. In order to reduce this limitation, it would be advantageous to develop educational resources and provide individuals with specific training to develop skills in this area.

Concluding Remarks

Results of this study show that developing and maintaining optimal team functioning in high performance curling is a dynamic process involving numerous factors that influence each other. The OTF model was inductively developed based on the perceptions, experiences, and recommendations of an elaborate sample of high performance athletes and coaches and a panel of experts. While it bares some similarities with existing frameworks, it is unique in the following ways: (a) it provides a comprehensive account of the interrelated team processes and attributes involved in optimal team functioning in curling, (b) core and peripheral components are presented in a hierarchical form, whereby communication is the cornerstone and structural team processes help guide individual and team regulation processes, (c) it distinguishes between periodic and ongoing processes, (d) it addresses both team and individual processes in the achievement of optimal team functioning, and (e) while it is the first inductively derived theoretical model, it focuses on dynamic and interactive processes that can be implemented into practice.

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Article 3

Learning from the experts:

Strategies used by coaches and athletes to optimize team functioning in curling

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Abstract

While team building intervention studies have been conducted, little is still known about concrete strategies that coaches and athletes use to develop and sustain effective team processes. The purpose of this study was to investigate the strategies used by high performance curling coaches and athletes to optimize team functioning. Based on a constructivist grounded theory approach (Charmaz, 2006), 12 women's teams (N=49 athletes) and seven men's teams (N=29 athletes) each shared their perceptions and experiences during a focus group interview, while 10 male coaches partook in a telephone interview. Over 150 strategies were identified and categorized based on the components of the Optimal Team Functioning (OTF) model (Collins & Durand-Bush, 2015b). Strategies addressed (a) individual attributes (e.g., create a player contract), (b) team attributes (e.g., determine and adjust game strategy), (c) the foundational process of communication (e.g., script routines for communication), (d) structural team processes (e.g., determine acceptable behaviour/standards), (e) individual regulation processes (e.g., fake it), (f) team regulation processes (e.g., discuss leadership behaviours), (g) the context (e.g., study/manage rocks and ice conditions), and their overall aim was to achieve (h) desired outcomes (e.g., optimal team functioning and performance).

Keywords: strategies, team functioning, team building, high performance, curling, sport, coaches, athletes

Learning from the Experts:
Strategies used by Coaches and Athletes to Optimize Team Functioning in Curling

Introduction

Whether the goal is to improve skills or win a championship, sport teams must achieve a high level of functioning in order to succeed. This requires team members to be proficient in implementing various team processes, such as communication, cooperation, and decision-making (Carron, Hausenblas, & Eys, 2005; McEwan & Beauchamp, 2014). Tuckman (1965) reported that 'storming', a period in which teams undergo conflict, is a normal phase of team development. Collins and Durand-Bush (2010) corroborated this in their longitudinal study, noting that an elite curling team experienced numerous peaks and valleys during a competitive season. However, little is known about the strategies that coaches and athletes use to help themselves overcome these difficult periods in order to develop and maintain optimal team functioning. Although team building research has shed light on team processes and activities that promote effective functioning, the focus has been on a limited number of processes, and details are often lacking to allow individuals to successfully put them into practice (Collins & Durand-Bush, 2015a). The aim of the present study was to fill this gap and investigate strategies used by high performance curling athletes and coaches to address a variety of team processes in order to optimize team functioning.

Team Building (TB) Research and Interventions

Team building (TB) is a method with task and social purposes (Carron et al., 2005) enabling groups to increase their effectiveness, satisfy the needs of members, and improve work conditions (Brawley & Paskevich, 1997). TB can be implemented, for example, by targeting key aspects of Carron and Spink's (1993) conceptual framework of TB: (a) team environment (i.e.,

distinctiveness), (b) team structure (i.e., group norms, positions), and (c) team processes (i.e., interaction, communication, sacrifice). TB interventions have been associated with desirable outcomes such as heightened performance, increased individual and collective awareness and efficacy, improved satisfaction, and enhanced cohesion (Martin, Carron, & Burke, 2009; Rovio, Arvinen-Barrow, Weigand, Eskola, & Lintunen, 2010). These interventions have varied in terms of the processes or factors targeted. The most common foci have been goal setting and role clarity/acceptance, however, awareness, communication, identity, interaction, leadership, norms, problem solving, and social support have been also addressed (Rovio et al., 2010). Interventions have ranged in duration from a few days to an entire season (Martin et al., 2009; Rovio et al., 2010) and were facilitated by researchers and/or by coaches. While some interventions were standardized and pre-determined (e.g., Newin, Bloom, & Loughead, 2008; Senécal, Loughead, & Bloom, 2008), others were developed based on team assessments (e.g., Stevens & Bloom, 2003; Voight & Callaghan, 2001). Few TB interventions were primarily team-centered and involved regular input from participating coaches and athletes (e.g., Collins & Durand-Bush, 2010).

TB studies have provided insight into "controlled, targeted approaches to interventions" (Brawley & Paskevich, 1997, p. 14) designed to improve team functioning. That said, TB research and interventions can be critiqued based on four aspects. First, interventions were often developed by researchers who had limited knowledge of the specific team(s) under study. Consequently, individual and team strengths and weaknesses may not have been taken into account when designing TB interventions, thus these may not have reflected the precise needs and preferences of team members. It can be argued that coaches and athletes are in an ideal position to identify these needs and how they should be addressed based on their knowledge and experience, for example, by considering what has or has not worked in the past.

Second, limited information was provided in studies vis-à-vis how interventions were delivered, and how coaches, athletes, and/or researchers nurtured team processes (e.g., during and post interventions). For example, Voight and Callaghan (2001) facilitated an intervention with two teams, which contributed to enhanced performance and unity. However, they provided no detail regarding the strategies used to facilitate each intervention (e.g., coping routines, mental toughness training, communication). Consequently, there is insufficient information to help coaches, athletes, and practitioners expand their 'toolbox' in this area.

Third, few studies to date have explored the sustainability of effects of TB interventions in sport. Stevens and Bloom (2003) suggested that effects could be short lived without the continued reinforcement and refinement of targeted team processes. Collins and Durand-Bush (2010) noted that developing and maintaining optimal team functioning is a challenging process requiring continuous effort and energy from both the coach and athletes.

Finally, while theory was referenced in some TB intervention studies, Rovio and colleagues (2010) reported that researchers have not always indicated how theory informed practice. There also appears to be incongruence between theory and intervention components in some studies (e.g., Bloom & Stevens, 2002; Stevens & Bloom, 2003; Voight & Callaghan, 2001). For instance, Stevens and Bloom (2003) referred to Carron and Spink's (1993) TB framework in their research, however, it was not clear how they used the framework to inform the intervention. Furthermore, they included strategies pertaining to social support and leadership in the intervention, yet these were not addressed in the guiding framework. This brings into question whether or not they believed the framework was comprehensive enough to steer the intervention and lead to desired outcomes.

In sum, TB intervention studies have shed light on important group processes (e.g., goal setting) contributing to effective team functioning in sport (Martin et al., 2009; Rovio et al., 2010). However, if we are to help teams be self-directed and optimize their functioning, further exploration into how this can be fostered and supported on a regular basis is warranted.

Strategies to Optimize Team Functioning

Empirical evidence regarding the everyday strategies used by coaches and athletes to successfully work together is limited. Nonetheless, some studies have been conducted and deserve attention. Bloom, Stevens, and Wickwire (2003) reported that coaches used social (e.g., team dinners), physical (e.g., team training), and psychological (e.g., preparing for obstacles) strategies to develop a cohesive team. Coaches implemented these strategies at various points during the year such as during the pre-season, prior to competitions, or following a period of frustration. TB was perceived as a process: "I don't think it is any one activity… I think it's a number of certain things that you're doing during the year that you hope are bringing them together…" (p. 138). Also, strategies effective with one team could be fruitless with another, highlighting the dynamic and complex nature of teams and the importance of adapting strategies.

In another study, Ryska, Yin, Cooley, and Gin (1999) found that common strategies used by coaches to enhance cohesion included setting team goals, helping athletes to accept individual differences, and praising team effort and cooperation. Additional strategies included learning personal information about each athlete, breaking up team cliques, and promoting cooperation (e.g., through drills). The limitation of this study was that coaches completed a survey in which they assessed the use and frequency of 14 strategies identified through a review of the literature. As such, specific and unique strategies employed by each coach may have been omitted, which restrains our understanding of what they do in reality to optimize team functioning.

Turman (2003) explored athletes' perceptions of coaches' behaviours and strategies that motivate and demotivate them as athletes, and the impact of these behaviours on team cohesion. Coaching behaviours and strategies leading to enhanced cohesion included motivational speeches, discussions of opponents, team prayers, team goals, social gatherings, team meetings, player councils, praise, and humour. Two coach characteristics - dedication and enthusiasm - were also associated with cohesion. Coaching behaviours deterring cohesion included unequal treatment of athletes, poor communication skills, and yelling. When results of this study are considered along with research on team climate and leadership, key themes pertaining to support, recognition, and fairness appear to be important contributors to optimal coach-athlete relationships and cohesion (Cotterill, 2013; Gardner, Shields, Bredemeier, & Bostrom, 1996; Hoption, Phelan, & Barling, 2007), and presumably, team functioning. Taken together, these results suggest that building an effective team is not merely about incorporating sporadic TB activities throughout the season; it is also about what coaches say and do on a day-to-day basis and how athletes perceive and respond to this.

Consistent with the notion that team effectiveness is influenced by everyday processes, recent studies on self-regulation in curling have demonstrated that optimal team functioning is contingent upon athletes' capacity to regulate their thoughts, emotions, and behaviours (Collins & Durand-Bush, 2010, 2014; Tamminen & Crocker, 2013). Tamminen and Crocker (2013) found that in order to achieve team goals, athletes used self-regulation strategies that involved hiding their emotions from others, keeping their behavior consistent, and censoring what they said in certain situations. Athletes also engaged in actions to regulate their emotions and help teammates do the same by providing positive and/or technical feedback, using humour, and adapting to circumstances (e.g., switch rocks). Coaches can equally contribute to team

functioning by increasing the effectiveness of their athletes' self-regulation (Callary & Durand-Bush, 2008; Collins & Durand-Bush, 2014). For example, an elite curling coach fostered self-regulation by helping his athletes set interpersonal goals, anticipate obstacles, communicate, monitor their performance, and be accountable. These strategies were perceived to enhance the team's cohesion and performance (Collins & Durand-Bush, 2014).

In sum, although the literature provides some insight into what and how team processes may be addressed to optimize team functioning, further research is warranted. Strategies are not comprehensive as studies often focused on only a few select team processes. Moreover, strategies were often developed by researchers who appeared to have limited knowledge of team needs, and were not grounded in the experiences of actual coaches and athletes. Finally, to date, team building intervention strategies have not been systematically linked to theoretical frameworks (Collins & Durand-Bush, 2015a; Rovio et al., 2010).

Purpose

The present study stemmed from a larger research initiative of which one of the aims was to investigate (a) factors that contribute to the development and maintenance of optimal team functioning within high performance curling teams, (b) strategies used by coaches and athletes to nurture team functioning, and (c) specific roles that coaches play in this process. This comprehensive research led to the development of a grounded theory model titled the Optimal Team Functioning (OTF) model (Collins & Durand-Bush, 2015b). The current study focused on the strategies used by coaches and athletes in order to shed light on how teams integrate and manage processes and attributes to optimally function and sustain high performance in the sport of curling. These strategies were linked to the components of the OTF model.

Methods

Constructivist Grounded Theory

A constructivist grounded theory approach was used to carry out this research. Systematic, yet flexible guidelines informed data collection and analysis, the result of which was the development of a grounded theory representing the participants' perceptions and lived experiences (Charmaz, 2006). This grounded theory became the cornerstone from which other research objectives, such as the one addressed in the current study, were fulfilled.

Participant Selection

Participants consisted of athletes and coaches from Canadian high performance curling teams who were recruited through theoretical sampling, that is, they were selectively sampled in order to refine research categories associated with the emergence of the grounded theory (Charmaz, 2006). Teams were selected based on gender, age, level of experience, longevity, and ranking in the Canadian Team Ranking System. The High Performance Director of Curling Canada (CC) was consulted in order to ensure there was an accurate representation of teams. High performance teams were defined as those competing nationally and/or internationally, or who had the potential to compete at that level (CC, 2014).

Several training camps and competitions held throughout the competitive season were identified and the High Performance Director sent a recruitment text to all identified teams and coaches who met the selection criteria and would be in attendance. Those who were interested in participating contacted the researcher directly, or the High Performance Director, to set up an interview. Teams of athletes were recruited for face-to-face focus group interviews, and coaches were recruited for one-on-one telephone interviews. In total, 19 high performance curling teams, typically comprised of a skip, vice-skip (third), second, lead, coach, and sometimes an alternate,

participated. At the time of the interviews, certain teams did not have a coach and some coaches did not volunteer to participate. As such, there were 12 women's teams (N=49 athletes), seven men's teams (N=29 athletes), and 10 coaches, all of whom were men.

Data Collection and Analysis

Consistent with the characteristics of grounded theory studies (Charmaz, 2006; Holt & Tamminen, 2010), data collection and analysis involved eight steps: (a) conducting interviews, (b) transcribing the data (c) reflecting and writing memos, (d) coding the data, (e) performing multiple coder checks, (f) verifying and re-coding the data, (g) developing the model, and (h) and verifying the model. Grounded theory studies involve an iterative and dynamic process (Charmaz, 2006), thus the aforementioned steps were not necessarily followed in a linear fashion. Table 1 provides a brief description of each step; see Collins and Durand-Bush (2015b) for further details.

Results

The strategies elicited from coaches and athletes are presented based on the OTF model (Collins & Durand-Bush, 2015b), which was developed as part of the larger research initiative. The OTF model comprises eight components deemed necessary to achieve optimal team functioning. There are six components that form the core of the model: (a) Individual Attributes, (b) Team Attributes, (c) Foundational Process of Communication, (d) Structural Team Processes, (e) Individual Regulation Processes, and (f) Team Regulation Processes. The final two components, Context and Desired Outcomes, are peripheral components that have a reciprocal impact on the other components of the OTF model (see Figure 1). These components are reiterated in Table 2, under which 155 strategies were categorized. In order to be included in the table, at least two teams had to have referenced the strategy. The following results are presented

in a succinct fashion, whereby an element of each component of the OTF model is presented, along with an example of one strategy from the table addressing it.

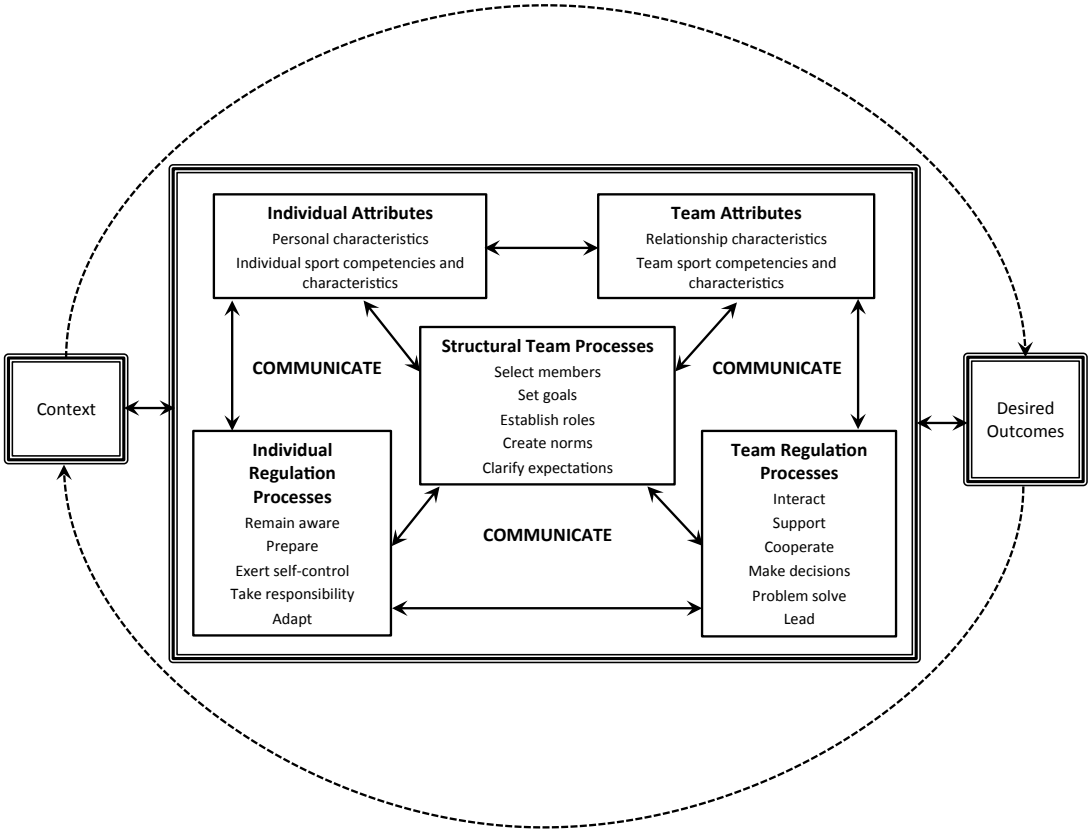

Figure 1. The Optimal Team Functioning (OTF) model

Individual Attributes

In the OTF model, individual attributes represent individual team members' personal characteristics (e.g., personality, motivation, physical stature), and individual sport competencies and characteristics (e.g., knowledge of the game, Collins & Durand-Bush, 2015b).

Personal characteristics. Commitment to the team and desired outcomes was a personal characteristic deemed key for optimal functioning. One coach relayed: "It's very important that they all want the same thing…. Nobody gets there unless we all get there" (C2). One strategy used to help individual members stay committed was to "Create a Player Contract". One athlete stated that by signing a player contract upon team formation, it "puts us miles ahead of teams

I've been on for a year or two" (W6-3). In some cases, these contracts were developed and enforced solely by the athletes or the coach, but in one case, it was developed in collaboration. For example, one coach took notes during a team discussion, after which he drafted up a contract that each member signed. Key elements included commitment to competition and practice schedules, fitness, rest and recovery, nutrition, a high work ethic, and team dynamics.

Individual sport competencies and characteristics. Athletes valued coaches who provided expertise to enhance individual competencies and characteristics. One strategy deemed important to do this was to "Read and Research Topics." For example, one coach contacted the Sport Information Research Centre (SIRC) to obtain coaching information while others relied on books: "…it's not like there's a school you can go to to figure [things out]…. You can get little snippets of stuff here and there from other experts and from reading…, but while you're coaching,…you're basically learning on the job" (C10). Both coaches and athletes reached beyond conventional learning methods to stay abreast of cutting edge knowledge and skills.

Team Attributes

In the OTF model, team attributes refer to team characteristics (e.g., relationship characteristics) and team sport competencies and characteristics (e.g., team tactics; Collins & Durand-Bush, 2015b).

Relationship characteristics. A number of teams referenced professionalism as an important team characteristic to develop in order to act professional and remain united. As one athlete explained, "professionals wouldn't say, 'okay, well that's good enough'. So…if we're going to train…[and] practice…[and] do the team dynamic work, we're going to do that properly" (M3-4). This was facilitated by having team members "Create a Team Identity". In one case, a mental performance consultant helped a team to create an identity by asking each player

to share what this identity should be - a brainstorm that resulted in 12 established common themes that became a reference point for team members' actions.

Team sport competencies and characteristics. A key team sport competency that was relayed concerned successfully making shots on the ice. A strategy used to nurture this was to "Determine and Adjust Game Strategy." One coach shared an example of switching to a more defensive style of play when performance was under par: "I don't want to say [the team] wasn't good enough, but [it] wasn't consistent enough to play the aggressive style that the men play" (C8). Other times, this strategy consisted of making minor adjustments based on how individual players were performing, for example, by using a "strategy that's going to compliment them a little bit better maybe than what I would normally do'" (C6). As one athlete noted, "sometimes they're just having an off day and you['ve] just [got to] push through it and help them out as much as you can" (W10-4).

Foundational Process of Communication

Communication is a fundamental process within the OTF model as it forms the basis for all other processes (Collins & Durand-Bush, 2015b). Communication requirements differed from one situation and context to the next, and between individuals. The same technical feedback had a different impact on different players and as such, one coach stated that he was still "figuring out…the right things to say at the right time with people" (C3). One strategy used to address this was to "Understand and Respect Individual Needs for Communication." This strategy allowed team members to adjust their communication, particularly in response to performance errors. For example, one athlete noted that her teammates all needed something different after a missed shot: "[W8-4] just likes to have her 15 seconds, go to the other end, have her own little quiet time. [W8-1] wants a little more pump up, 'it's okay'…. So we adapt" (W8-3). On another team, one

athlete preferred encouragement after a miss, another wanted criticism, and another did not want to hear anything at all. What mattered was that team members understood and respected each other's needs so that they could refocus and be successful during the next shot.

Structural Team Processes

Structural team processes are so named because they contribute to the development of a team's structure. These processes are actions performed by team members to: (a) Select team members, (b) Set goals, (c) Establish roles, (d) Create norms, and (e) Clarify expectations (Collins & Durand-Bush, 2015b).

Select team members. In order to optimally function, many teams highlighted the importance of recruiting well-suited members (e.g., perceptions, lifestyle, stage of life, priorities, geographical proximity, individual personalities). A strategy used to select team members who could collectively contribute to common desired goals and outcomes was to "Select Team Members based on Compatibility". One skip said: "Don't necessarily focus on looking for the best player, look for the best teammate. Someone who is supportive, who makes you feel like you can make anything…. Pick someone who's got similar goals, similar drive, [and] similar personality" (M5-4). While some teammates noted the value of similarity, others emphasized complementarity. Regardless, one team said, "There's got to be a lot of research done. You just don't go into something blind, that's for sure" (M2-3).

Set goals. Most teams stressed the importance of sharing common goals. These included, for example, qualifying for Olympic Trials (i.e., long-term goal), finishing first in the round robin during a competitive event (i.e., short-term goal), and communicating after mistakes during a game (i.e., daily goal). "Set Pre-Season, Pre-Competition, and Pre-Game Goals" was a strategy that helped teams focus on their collective goals and actions to achieve them. This process was

either formal (e.g., built into the pre-game routine) or informal. For example, before every game, one team reviewed 'team cards' they had put together to discuss their ultimate goal (e.g., to win the championship), stepping-stone goals (e.g., to make playoffs), and process goals (e.g., to fulfill individual roles; W8). Teams also set goals addressing specific attributes (e.g., have a positive attitude) and processes such as communication (e.g., be open and honest), individual regulation (e.g., take responsibility), and team regulation (e.g., work together to play more conservatively).

Establish roles. A key component of the OTF model pertains to roles. Teams emphasized that roles must be clearly defined in order to increase the likelihood of success and reduce the chances of conflict: "Each player in a curling team needs to have roles within that team. Because people will slack off" (C4). One coach noted that there were at least 20 roles that needed to be filled on a team (e.g., booking hotels and flights, managing finances, studying opponents, scouting rocks, planning practices). One strategy used to address roles was to "Define/Assign Roles" and coaches were often involved in this process:

> I identified 'x' number of roles on a team and I said, 'Okay, this is one of the roles so we need a pre-event planner. Who wants to take on that role?'... People will kind of fall into it a bit, but if you want a team to feel like a team, you need to assign roles early on. (C4)

Create norms. Norms constituted the "basic ground rules for how [a team] will interact as a big group" (C1). One strategy used to create norms was to "Determine Acceptable Behaviour/Standards." Athletes felt that it was important to determine "from the beginning that there will be open discussion about what's okay and what's not okay, or what helps and what doesn't help" performance (W5-4). Norms pertained to various aspects such as acceptable on-ice behaviour (e.g., displays of frustration), off-ice behaviour (e.g., drinking at competitions), team

attitude (e.g., no drama), practice requirements (e.g., five sessions per week), as well as performance standards (e.g., be an 85% shooter). One coach went as far as to script routines for acceptable standards of behaviour during games, which included times to exchange positive words on the ice.

Clarify expectations. Teams also discussed the role of expectations in optimal team functioning. Expectations referred to individual beliefs regarding what typically happens in certain situations or contexts, unlike norms, which are characterized by group-held beliefs. Taking the time to "Share and Respect Expectations" was used as a strategy: "We can't all silently have our own expectations; we need to be clear about what they are" (C6). Remarkably, one coach did the following to clarify expectations: "I just went in and played all the different positions throughout the weekend and said, 'this is what I expect'" (C5).

Individual Regulation Processes

Individual regulation processes are "actions contributing to the routine functioning and activities of an individual team member in varying contexts" (Collins & Durand-Bush, 2015b, p. 23). These actions include: (a) Remain aware, (b) Prepare, (c) Exert self-control, (d) Take responsibility, and (e) Adapt (Collins & Durand-Bush, 2015b).

Remain aware. In order to effectively work together, team members agreed that they must be aware of themselves, their teammates, and the impact that they have on one another and on team performance. As one athlete stated, "It's a lot about that self-awareness of where you are as a person and how that affects the team" (W6-4). A strategy to address this is to "Make and Share Observations" to increase and sustain awareness. Observations could relate to performance indices, such as the pace/flow of the game or variances from normal tendencies, and they also concerned group dynamics, for example, body language and group interactions. One coach

talked about sharing his observations during the post-game debrief: "If everything I want doesn't come out of [the questions I ask], then I make observations like, 'it seemed like you guys lost energy…Is that true?'" (C10).

Prepare. Many teams noted that different types of individual preparation (e.g., physical, mental, social) were essential for success. For example, one athlete stated that the goal before every game and shot was to be "as mentally prepared as possible every single time" (M1-3). One strategy that was used to prepare to perform was to "Create Pre-Game and Pre-Shot Routines." Pre-game routines typically involved setting a specific time to arrive at the competition venue, warm up, and check in with each teammate. Some teams practiced and timed their pre-game routine to ensure it was efficient. One coach highlighted the importance of tailoring pre-game routines to the individual players' needs: "I wanted to have a team meeting before they went out and played. One of the players finally told me, 'You're affecting my performance because…to prepare for a game, I need…20 minutes by myself'" (C4). In order to accommodate everyone, the coach started meeting with the skip to discuss strategy 10 minutes before the game, while the other athletes could continue to prepare individually.

Exert self-control. Behavioural and emotional control was deemed necessary for optimal functioning and performance. One team reported working on minimizing the "huge swing between 'this is how we look when we're winning…' and 'this is how we look when we're losing'" (M5-2). One strategy employed by individual members to maintain control was to "Fake It." One athlete noted that she had a very dominant personality and when she was in a bad mood, the other players could feel it: "I sometimes have to… force myself to be positive more. Which is good, because then it just makes me feel better. Like if I'm feeling 'ugh', then if I fake it, then I start to feel better and everyone feels better" (W8-1). This individual regulation strategy thereby

allowed athletes to remain consistent and reduced the impact of negative emotions on team members' satisfaction and performance.

Take responsibility. The importance of taking ownership for individual actions was highlighted by a number of athletes and coaches. One coach stated, "[When] they're performing badly, I think the team dynamics goes down…. They're trying to lay blame more than anything else, or they're trying to make an excuse for…their performance" (C7). A key strategy to address this was to "Apologize for Mistakes". One coach highlighted that "silence is a team killer":

> If a shot is missed, it was either thrown poorly, brushed poorly, or…the line was called poorly. It has to be one of those three!... So as soon as there is a miss, if there is silence, it's like saying, 'I did nothing wrong'…. [But] something went wrong!... You want to hear the 'sorry' word every once in a while after a miss so you can figure out what…happened so you can make the next shot. (C10)

Taking responsibility for mistakes was deemed crucial to be able to identify solutions and adjust behaviours.

Adapt. An important element of the teams' effectiveness consisted of adapting, which was defined in the OTF model as changing or modifying something or oneself to suit new or different purposes (Collins & Durand-Bush, 2015b). Adapting was particularly important when dealing with losses and/or setbacks "because if you don't, it's going to affect the next time you come out to throw" (C4). In order to help team members adapt, one strategy was to "Identify and Work on Weaknesses". One coach shared: "Watch…how they deal with poor performance. You've got to address that as fast as you possibly can so that it doesn't fester…. Identify their weaknesses as fast as you can and try and work on them" (C8). Adapting served multiple purposes, enabling athletes to modify technical skills and game strategy to improve performance.

One athlete stated that getting assistance from the coach to identify and fix weaknesses by incorporating a few extra draw drills into practice was "one of the largest assets that I get out of having [coach]!" (W6-3).

Team Regulation Processes

Just like teams reported the need to individually regulate themselves on a day-to-day basis, they discussed the necessity to regulate team processes. Six team regulation processes were included in the OTF: (a) Interact, (b) Support, (c) Cooperate, (d) Make decisions, (e) Problem solve, and (f) Lead (Collins & Durand-Bush, 2015b).

Interact. Teams spent a significant amount of time interacting with one another: "You're with these people 24/7" (W2-2). Consequently, having positive interactions was essential because, "if you have one player who's segregated…or who has a problem, that's like a quarter of the team!... [On] a bigger 12 or 13 person team, it's less influential" (M1-4). In order to optimize interactions, it was essential for team members to "Spend Time Together". This consisted of engaging in both social (e.g., going out for dinner/drinks, hanging out at the hotel, playing golf) and task-based activities (e.g., performing team circuits, playing league games). Interestingly, this strategy served several purposes such as helping a new member integrate into the team, bonding with teammates, winding down at the end of a stressful competition day, and reducing the potential development of cliques.

Support. Teams also discussed the importance of support, which was different than interactions as it specifically involved helping one another (e.g., to perform at their best) and not just 'hanging out'. One coach used the analogy of a boat in a storm to highlight the importance of support: "You want the hull to be strongest when the waves are the highest…. And if you don't have that, then you have four players, but you don't have a team. And what you need is

support" (C2). To ensure that team members felt supported, one strategy was to "Establish a Support Team". Support teams comprised, for example, Curling Canada staff and high-performance coaches, mental performance consultants, family and friends, fifth players, as well as personal trainers, and nutritionists. These individuals provided invaluable practical, financial, and emotional support to athletes and coaches. One coach indicated: "I really think it's important to have a support system to be successful…. It's harder to move the yardsticks if it's you versus them on the tough issues" (C10). Several teams iterated that their coaches' openness and eagerness to establish a support team was a key tactic contributing to their success.

Cooperate. The importance of cooperation, that is, a team's ability to work together in order to accomplish a specific task was also underscored. As one team stated, "It's how the team works with one another and as a whole. And if it goes well, then you're going to win…95% of the time against a team that [is] maybe even fundamentally, technically better than you" (M5-2). One strategy used was to "Discuss Individual Tendencies", which interestingly, was also associated with nurturing individual attributes. For instance, one team completed the Test of Attentional and Interpersonal Style and discussed it as a team in order to understand how to best cooperate under pressure. As such, team members knew how to give each other specific task-focused information before their shots. Coaches were also involved in identifying and relaying athletes' tendencies: "When we were on the ice this morning, [coach] was really trying to point out each other's tendencies and have us understand each other" (W5-3).

Make decisions. An important team process pertained to effective decision-making, and a key aspect of this was trust. One skip described difficulties that resulted when a former teammate did not trust her decisions: "[She] was hard on my confidence…. [She questioned] all sorts of things.… And I didn't always feel like she believed in me…. It's a disaster when things

are going well, it's a tornado when things are not" (W7-4). One strategy to enhance decision-making was to "Refer to the Game Plan". This got team members on the same page and provided an element of 'structure' to on-ice decisions. On some teams, the game plan was created collaboratively, while on others, it was developed by the coach, or by the coach and skip. For example, one coach and skip developed a more 'defensive-style' game plan, which they presented to the team: "Here's what we do in the first end, here's what we do in the second end, and here's what we do in the third end. Make sure that you don't deviate from that game plan" (C8). For some teams, the decision-making process appeared firm and for others, it was more flexible and dynamic.

Problem solve. The ability to effectively solve problems was another vital component of optimal functioning presented by different teams. For example, when issues or problems were not addressed in a timely manner, they could become larger obstacles that negatively impacted performance. One strategy to address this was to "Mediate Conflict Resolution". In some cases, the mediator was a member of the support team, such as the mental performance consultant, but in most cases, it was the coach: "You need a mediator on the team at times to deal with any kind of disputes or issues" (C4). One coach noted that if an issue persisted, he would bring it up for discussion as if it was him who had issue with it and not the athlete who confided in him. Another team referenced a process they followed by trying to address issues first, before involving the coach:

> If you have a problem… let's have a talk about it, let's bring it out because it's really not a good performance state to be in.… If it can't come directly from you to me or me to you, it goes through [Coach]…. Let him figure out the best way to resolve it. (W11-3).

Lead. A number of teams highlighted the necessity for leadership, particularly given that coaches had limited on-ice influence. As one coach stated, "I learned that there's only so much I can do as a coach and I need to find, really, the leader on the ice. Too often that seems to be overlooked in curling" (C5). "Discuss Leadership Behaviours" was a strategy used to promote leadership. For instance, one coach reported:

> Obviously the skip is… the leader and she has the most responsibility and sometimes it's important that she understands that… She has that responsibility as a leader to communicate certain things to the girls, so I'll probably have more individual conversations with [her]… reminding her of that because she's so quiet and doesn't have that outgoing, open personality… she has to work at it more. (C9)

In discussing leadership behaviours with their athletes, coaches were themselves acting as leaders and promoting the development of this skill.

Context

Teams noted the context in their discussion of optimal functioning. The context denotes the "conditions that existed when and where something occurred; it referred to the environment, people, objects, and circumstances associated with particular situations" (Collins & Durand-Bush, 2015b, p. 29). "Study/ Manage Rocks and Ice Conditions" was a strategy used by teams to familiarize themselves with the context. One skip highlighted the importance of scrutinizing the ice before games and getting input from her coach:

> I really like input from the coach to see what he sees in that 10 minutes.... Are we on the same page and can he give me a tool to use going into that game? Because an extra set of eyes are a wealth of information as far as that's concerned. (W4-4)

One coach shared that being able manage the context, in this case, the rocks and ice conditions, requires a great deal of skill:

> We went to the [championship]... and one of the objectives we had when we came back from that competition was to learn how to utilize our release to manage rocks on different ice conditions because at that time, most of the players on that team really were good throwers but they weren't good at using different releases to manage [the] rocks' curl on different ice conditions. (C3)

Overall, context-related strategies encouraged teams to focus on and regulate aspects related to the context that were within their control (e.g., their communication to respond to opponents' strategy).

Desired Outcomes

The aforementioned strategies were used by teams to address specific individual and team processes and attributes, and to more broadly positively impact desired outcomes such as optimal team functioning, as evidenced by the title of the OTF model. Teams also mentioned other general expected outcomes including optimal performance, success, peak cohesion, and well-being (i.e., positive experiences, high satisfaction). By implementing a variety of strategies throughout the year, teams reportedly increased the likelihood of achieving their desired outcomes. As an example, to move toward optimal team functioning, one coach worked with his skip to help him manage his expectations (i.e., clarify expectations) and adjust his game strategy (i.e., adapt) so that these fit his new, less experienced teammates (i.e., team sport competencies and characteristics): "Up to [now] it's worked well. He puts his frustration on the back burner. He acts more positive. Which if course gets better results from the others" (C6). Reciprocally, achieving desired outcomes had a positive influence on attributes and processes:

> When people are performing well... it's much easier for [them] to play the functional role that they've been given on the ice, and to not let any interpersonal things get in the way. But I think when it's not going as well, sometimes any little thing that you normally let slide off your back as an athlete begin[s] to bug you a little bit more! (C1)

Discussion

The purpose of this study was to investigate strategies used by high performance curling coaches and athletes to optimize team functioning. Overall, 155 strategies were identified and linked to the components of the OTF model (see Table 2). The wealth of strategies shared shows that several actions are required to develop and sustain effective team processes and attributes within high performance curling teams. Some strategies were similar to those commonly cited in team building intervention studies (e.g., set individual and team goals, Senécal et al., 2008; Stevens & Bloom, 2003; Voight & Callaghan, 2001), while others were more unique (e.g., select team members based on compatibility, establish a decision-making process).

While coaches used numerous strategies to help athletes work well together and achieve their goals, so did the athletes, which demonstrates that they play a substantial role in nurturing their own team processes and attributes. Pain, Harwood, and Mullen (2012) reported that when given the chance to reflect and provide input, athletes can clearly identify what factors are contributing to (e.g., clear roles, sound relationships) or hindering (e.g., poor communication, lack of composure) their success. Other studies have shown that athletes use different strategies to enhance various team processes such as problem solving (Holt, Knight, & Zukiwski, 2012) and communication (Collins & Durand-Bush, 2010). That said, overall, athletes have rarely been presented as active agents or leaders in team building processes in the literature. The results of

the present study suggest that both coaches and athletes are team experts and should provide insight into ways to optimize their functioning.

Strategies elicited in this study were linked to the eight components of the OTF model (Collins & Durand-Bush, 2015b), which can be targeted when working with teams. By adopting a comprehensive and inductive approach to examine team functioning, the researchers were able to depict links between strategies and show that some strategies serve multiple purposes. For instance, one strategy involving feedback was linked to several components of the OTF model such as communication, individual regulation processes (i.e., adapt), and team regulation processes (i.e., cooperate, lead). Another strategy concerned player contracts and was associated with individual attributes (i.e., personal characteristics), structural team processes (i.e., create norms), and individual regulation processes (i.e., take responsibility). Results suggest that in an effort to efficiently enhance team functioning, team members can use a particular strategy to optimize multiple processes and attributes. Although some team strategies such as setting goals, organizing team dinners, and praising team efforts were discussed in the literature (Bloom et al., 2003; Ryska et al., 1999), their link to different types of processes and frameworks were not addressed.

Strategies pertaining to communication should be emphasized when working with teams. Communication has been described as fundamental and vital to team success (Beauchamp, Maclachlan, & Lothian, 2005; Carron et al., 2005; McEwan & Beauchamp, 2014; Yukelson, 1997). It was also identified as the cornerstone of the OTF model (Collins & Durand-Bush, 2015b). Table 2 shows that some strategies directly targeted communication (e.g., understand and respect individual preferences for communication, share feelings) while others relied on communication (e.g., define/assign roles, mediate conflict resolution). Only a few strategies in

the table did not hinge upon it (e.g., journal, visualize). Given this, it seems logical that when attempting to optimize team functioning, developing effective and efficient communication strategies should be a priority. Interpersonal communication has been an explicit focus of only a few intervention studies (e.g., Bloom & Stevens, 2002; Collins & Durand-Bush, 2010; Dunn & Holt, 2004; Stevens & Bloom, 2003). Connelly and Rotella (1991) raised concern that this skill is often ignored in physical and mental training, leading teams to under-utilize it or simply not know how to effectively use it.

Team building interventions have predominantly focused on strategies pertaining to goals and roles (Rovio et al., 2010), which also emerged in the current study and were linked to important structural team processes that should be periodically revisited throughout a season (Collins & Durand-Bush, 2015b). Many strategies were linked to these particular team processes. For example, coaches and athletes reported setting both individual and team goals, as well as process, performance, and outcomes goals. Some goals directly targeted team dynamics and some teams discussed pre-season, pre-competition, and pre-game goals. The importance of sharing, reaffirming, and monitoring goals was also noted.

Strategies pertaining to interaction (e.g., Newin et al., 2008), support (e.g., Stevens & Bloom, 2003), problem solving (e.g., Dunn & Holt, 2003; Holt et al., 2012), and leadership (e.g., Bloom & Stevens, 2002; Stevens & Bloom, 2003) were sporadically discussed in the literature. Similar strategies emerged in the present study and were linked to key team regulation processes that should be fostered on a regular basis (Collins & Durand-Bush, 2015b). Of interest, strategies enabling coaches and athletes to successfully cooperate (e.g., develop a game plan) and make decisions (e.g., establish a decision-making process) were reported and grouped with the aforementioned types of strategies.

This study is one of the few to show the importance of individual regulation processes to achieve optimal team functioning. Team members reported numerous strategies to prepare for (e.g., create pre-game and pre-shot routines), control (e.g., implement pre-game and pre-shot routines), and evaluate (e.g., journal) performances. Self-regulation skills in curling were found to be key in previous studies (Collins & Durand-Bush, 2010, 2014; Tamminen & Crocker, 2013) and associated with enhanced cohesion and performance (Collins & Durand-Bush, 2010). These findings highlight the value of developing strategies enabling both individual members and the team itself to self-manage and be effective. While athletes are ultimately responsible for their own self-regulation, coaches and teammates can play a key role in facilitating self-regulatory capacity (Collins & Durand-Bush, 2010, 2014; Hadwin, Jarvelä, & Miller, 2011). For instance, in the present study, coaches contributed to athletes' preparation and reflection by monitoring behaviours and performance, and teammates fostered self-control by saying things the right way or choosing the right time to communicate. Clearly, the ability to nurture team members' self-regulation is dependent upon considerable awareness and knowledge of their needs and preferences (Beauchamp, Jackson, & Lavallee, 2007; Collins & Durand-Bush, 2010).

Strengths, Limitations and Future Research

A strength of this study is that it is the first to provide an exhaustive list of strategies addressing a multitude of team processes and attributes. Typically, scholars have focused on only a few strategies and select team processes such as communication and coordination (e.g., Connelly & Rotella, 1991; Eccles & Tran, 2012). An additional merit of this study stems from the research methodology used. Recently, Collins and Durand-Bush (2015a) made a call for grounded theory research to uncover what coaches and athletes actually *do* in order to optimally function in their environment. They posited that such an approach would contribute to a more

comprehensive understanding of the processes required for effective team work, and would allow researchers to examine the "specific applied strategies linked to these team processes…in order to provide concrete empirical data to guide practitioners" (p. 13). Using a grounded theory approach (Charmaz, 2006), the researchers turned to the experts in this area, that is Canadian high performance coaches and athletes, to learn from their experiences. Consequently, a considerable number of novel strategies were uncovered and provide important insight into the day-to-day functioning of curling teams, and how it can be managed by coaches and athletes.

Although a strength of this study is that both coaches and athletes were recruited in an effort to report a variety of perspectives, a limitation is that they were interviewed separately in order to encourage full athlete disclosure during the focus group interviews. It was thus sometimes difficult to discern the congruency between coaches and athletes' perceptions regarding some strategies. In the future, strategies could be investigated using a longitudinal (e.g., season-long) approach, involving both coaches and athletes in regular focus group interviews and observations of their performance environment.

Additionally, because a specific sample was used in the present study (i.e., high performance curling coaches and athletes), further research is required to explore the applicability of these strategies to other sports. Given that scholars have highlighted the dynamic and multidimensional nature of teams (Carron et al., 2005), and the impact of the context on the needs and goals of team members (Carron et al., 2005; McEwan & Beauchamp, 2014; Pain & Harwood, 2007), strategies may differ across sports and contexts. For instance, in a small team sport such as curling, there is ample opportunity to involve all team members in various processes and strategies (e.g., define/assign roles). However, this may not be feasible or it may be more difficult within larger teams (e.g., football, hockey). Furthermore, strategies addressing

the context (e.g., study/manage rocks and ice conditions) would not be applicable to other sports. Thus, while it seems likely that similar strategies or actions (e.g., study/manage) may be required, the content and methods of implementation of these strategies or actions may differ based on the sport, context, as well as individual and team attributes.

Finally, in order to facilitate knowledge transfer and ensure that coaches and athletes can readily apply these findings, efforts must be made to guide and train them in this area. There is value in developing concrete guidelines to direct teams in facilitating optimal functioning over the course of a season. For instance, key strategies could be identified for use during the pre-season, in-season, and post-season phases. This could be accomplished via educational resources, applied workshops, and/or individual consultations with coaches and athletes.

Concluding Remarks

In sum, coaches and athletes reported many strategies related to components of the OTF model (Collins & Durand-Bush, 2015b) in order to develop and sustain optimal team functioning. While coaches used many strategies to help their teams effectively work together, athletes also played an active and sizeable role in this process. As evidenced in the high number of strategies presented, nurturing team processes and attributes involves a large repertoire of individual and team actions, some of which can serve multiple purposes. Unique to the present study was the importance of individual regulation strategies, suggesting that team building interventions should focus on both the team itself and individual members. Communication is crucial as it was involved in most of the strategies, thus methods aimed at enhancing communication within teams should be prioritized.

Achieving optimal team functioning is a challenging and effortful process that undeniably impacts team members and performance (Bloom et al., 2003; Collins & Durand-

Bush, 2010, 2014). The present study, which was grounded in the experiences of high performance curling coaches and athletes, provides valuable insight into real actions that can lead teams to effectively work together in order to achieve desired goals and outcomes. It is hoped that the findings will guide coaches, athletes, and practitioners in this area, and be a springboard for future research linking theory and practice.

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Table 1. Data collection and analysis steps

	Data Collection and Analysis Steps
Interviews	Face-to-face focus group interviews with teams of athletes (N=19 teams, N=78 athletes) - Athletes first signed a consent form and completed a demographic questionnaire - Questions centered on identifying: a) factors contributing to the development and maintenance of optimal team functioning, b) strategies used to develop and maintain optimal team functioning (current article focuses on this data), and c) roles of coaches in optimizing team functioning - Interviews were audio recorded and lasted on average 65 minutes - Athletes then completed an exit questionnaire to indicate their level of agreement with the interview and add content if necessary Individual telephone interviews with coaches (N=10) - Coaches first signed a consent form, completed a demographic questionnaire, and returned these via email - Interview guide was similar to that for athletes but adapted to explore the coaches' perceptions / experiences - Interviews audio recorded and lasted on average 85 minutes
Data transcription	- 29 interviews were transcribed verbatim and participants were assigned an ID to ensure anonymity (W for women, M for men; 1-12 for women's teams, 1-7 for men's teams; 1 for lead, 2 for second, 3 for third, 4 for skip, 5 for alternate; C for coaches but numbers do not correspond with team's number to protect anonymity) - Transcripts were emailed to athletes and coaches for verification - only minimal changes were made - Follow-up clarification questions were emailed to participants and responses were added to the data
Researcher reflexivity/memo-writing	- Reflection and memo-writing were carried out throughout the research process - They pertained to new questions and additional probes to use during interviews, codes emerging from the data, and ideas on how best to code and categorize the data
Data coding	- The text was broken into meaning units, which were inductively coded based on the content/research questions/interview guides - Coded meaning units were categorized into first, second, third, fourth, and fifth-order themes using a coding tree [e.g., factor (first-order code); make decisions (second-order code); be decisive (third-order code)] - With theoretical sampling, theoretical saturation was reached - no new first and second-order codes were added in the latter part of the analysis. Only some third, fourth, or fifth-order codes were created to account for details/examples.
Multiple coder checks	- Two doctoral students with no expertise in team dynamics were given a subsample of meaning units and the coding tree, and were asked to independently code the data; the purpose was to allow the researcher to further reflect on the data and consider alternative possibilities and interpretations (Barbour, 2001) - The researcher engaged in debrief meetings with the thesis supervisor to discuss each step of the research
Verification and re-coding of data	- The researcher re-read each of the 29 transcripts thoroughly, reflected on the codes, and revised any inconsistencies
Model development	- The researcher and thesis supervisor compared and contrasted the data and the 21-second order codes in order to re-group them under components (N=8) in a model; relationships were drawn between components
Model verification	- The model was verified by an expert panel composed of the High-Performance Director of Curling Canada, an expert researcher in the field of coaching and team building, one athlete and one coach who participated in the study, a mental performance consultant working with high performance curling teams, and a doctoral student from the researcher's laboratory

Table 2. Strategies to optimize team functioning (in alphabetical order under each component of the OTF model)

Individual Attributes

Personal Characteristics

Address individual commitment
Celebrate success
Create a player contract
Focus on what you can control
Provide/use cue words or statements
Remain positive
Set/provide process goals and reminders

Individual Sport Competencies and Characteristics

Discuss individual tendencies
Identify and work on individual weaknesses
Learn from other professionals
Read and research topics

Team Attributes

Relationship Characteristics

Assign rooms based on compatibility
Create a team identity
Determine and reinforce team values
Give pep talks
Pay attention to relationships
Plan and implement team-building activities
Recognize and address needs and differences
Stay in contact
Use humour
Use positive affirmations

Team Sport Competencies & Characteristics

Determine and adjust game strategy
Develop a game plan
Discuss preferences and tendencies
Identify and work on team weaknesses
Use personality inventories and share results

Communicate

Accept and provide feedback
Address good and bad aspects of performance
Ask questions
Choose the right time
Designate a communication leader
Discuss team dynamics
Encourage and facilitate discussion
Focus on what is most important
Frame it in a positive way
Have one-on-one discussions
Listen
Pay attention to non-verbal cues
Record on-ice communication
Refrain from giving criticism
Say the right things
Say things the right way
Schedule regular team meetings
Script routines for communication
Share information
Understand and respect individual needs for communication
Use an open door policy

Structural Team Processes

Select Members

Select team members based on compatibility
Select team members based on skills/experience

- **Set Goals**
  - Evaluate and re-evaluate goals
  - Reaffirm goals
  - Set individual and team goals
  - Set measurable goals
  - Set outcome, performance, and process goals
  - Set pre-season, pre-competition and pre-game goals
  - Set team dynamics goals
  - Share goals and progress reports
- **Establish Roles**
  - Adjust roles
  - Attribute coach's role to athletes (when absent)
  - Define/assign roles
  - Focus on your own responsibilities
- **Create Norms**
  - Create a player contract
  - Determine acceptable behaviour/standards
  - Develop a game plan
- **Clarify Expectations**
  - Manage expectations
  - Share and respect expectations

Individual Regulation Processes

- **Remain Aware**
  - Attune to personal and others' needs
  - Do self-assessments/check-ins
  - Journal
  - Make and share observations
  - Monitor behaviour/performance
  - Reflect
  - Share feelings
- **Prepare**
  - Create pre-game and pre-shot routines
  - Establish cue words to stay focused
  - Prepare for opposition and ice conditions
  - Strategically plan for practices/competitions
  - Visualize
- **Exert Self-Control**
  - Fake it
  - Hide emotions
  - Implement pre-game and pre-shot routines
  - Use cue words to stay focused
- **Take Responsibility**
  - Acknowledge struggles
  - Apologize for mistakes
  - Call issues out
  - Debrief games/competitions
  - Encourage shared responsibility
  - Establish consequences
  - Evaluate performance
  - Monitor behaviour
  - Provide responsibility reminders
  - Revisit player contract
  - Take ownership
- **Adapt**
  - Adjust game strategy
  - Adjust social interactions
  - Change positions
  - Help teammates adapt
  - Identify and work on weaknesses
  - Integrate feedback
  - Learn from past mistakes and experiences
  - Let go of mistakes
  - Provide performance reminders

- Recognize and modify ineffective strategies
- Talk about tasks
- Use humour
- Move on/quit/take time off

Team Regulation Processes

Interact

- Compete and train together often
- Present yourselves as a unit
- Schedule time for friends and family
- Spend time together
- Take a step back and give space

Support

- Act as a sounding board
- Ask for what you need
- Encourage teammates and nurture confidence
- Establish a support team
- Help teammates refocus
- Praise
- Provide necessary distractions
- Provide positive or motivational reminders
- Provide unconditional support
- Use humour
- Verify team morale

Cooperate

- Accept and provide feedback
- Develop a game plan
- Discuss good and bad aspects of performance
- Discuss individual tendencies
- Make the most of what you have
- Reaffirm goals
- Share information

Make Decisions

- Be decisive
- Consider/ask for/voice input
- Establish a decision-making process
- Refer to the game plan
- Test out alternatives
- Weigh pros and cons

Problem Solve

- Address issues as a team
- Address issues directly
- Address issues individually
- Anticipate and prepare for obstacles
- Break the ice and put issues on the table
- Encourage problem solving
- Focus on the facts
- Give or take space
- Mediate conflict resolution
- Seek/provide advice or perspective
- Talk it out

Lead

- Consider the impact of leadership on performance
- Discuss leadership behaviours
- Lead by example
- Provide additional support to leaders
- Provide feedback
- Share leadership responsibilities

Context

- Prepare for the opposition
- Scout opponents
- Study/manage rocks and ice conditions

Article 4

The roles of coaches in optimizing team functioning in curling: Perceptions of high performance coaches and athletes

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Abstract

Coaches have been described as teachers, leaders, motivators, managers, and arbitrators (Giges, Petitpas, & Vemacchia, 2004). That said, how coaches fulfill such roles is not well understood. The current study stems from an extensive grounded theory (Charmaz, 2006) research initiative in which factors and strategies contributing to optimal functioning in high performance curling teams were investigated. The purpose of this study was to uncover the various roles of curling coaches in the process of developing high functioning teams based on the perceptions of both coaches and athletes. Participants were members of 19 high performance curling teams (N=78 athletes) and their coaches (N=10). Data were collected from teams of athletes through face-to-face focus group interviews, and from coaches via individual telephone interviews. Results show that coaches played five primary roles: technical/tactical specialist, mediator, facilitator, manager, and motivator. These roles were dependent on athletes' needs as well as both coaches and athletes' personal characteristics and competencies. Coaches and athletes' perceptions regarding these roles sometimes differed, however, both parties reported that coaches sometimes lacked competencies to perform certain roles. Consequently, specific training should be provided to enable coaches to assist athletes in optimizing team functioning in curling.

Keywords: coach, roles, athletes, team functioning, team building, high performance, sport, curling

The roles of coaches in optimizing team functioning in curling: Perceptions of high performance coaches and athletes

Introduction

Team sport coaches have a tremendous impact on team functioning (Bloom, Stevens, & Wickwire, 2003; Collins & Durand-Bush, 2010, 2014; Pain, Harwood, & Mullen, 2012; Turman, 2003). Among other outcomes, coaches' behaviours have been linked to athlete satisfaction, as well as team cohesion and performance (Baker, Yardley, & Côté, 2003; Bloom et al., 2003; Martin, Carron, & Burke, 2009; Pain et al., 2012). Despite this, few researchers have specifically explored the different roles that coaches play within team sports to develop and sustain optimal team functioning.

According to Cushion (2010), the vast majority of the coaching research has focused on coaches' observable in-game and in-practice behaviours such as training and instruction. Specifically, Cushion (2010) noted that approximately 80 percent of coaching studies have focused on three primary coach behaviours: instruction, positive reinforcement, and intentional silence. However, sport coaching is complex and extends beyond these behaviours (Bowes & Jones, 2006; Côté, Salmela, Trudel, Baria, & Russell, 1995; Jones & Wallace, 2005; Lyle, 2002). Furthermore, "coaching behaviours per se do not stand alone as predictors of effective coaching" (Cushion, 2010, p. 44) and do not reflect the tacit knowledge and complex series of actions required to facilitate the coaching process (Lyle, 2002). This complexity is highlighted in Lyle's (2002) definition of sport coaching as a continuous and dynamic process representing an "agreement between athlete and coach… [which] consists of the purposeful, direct and indirect, formal and informal series of activities and interventions designed to improve competition performance" (p. 40).

Clearly, there is a lot more to effective sport coaching than training and instructing athletes. By focusing research on observable behaviours, scholars have limited our understanding of the many ways that coaches exert influence in different sport situations and contexts in order to bring teams to improve their functioning and performance. The purpose of the present study was to investigate the different roles of high performance curling coaches in developing optimally functioning teams. Team functioning "referred to the processes by which team members worked together and operated on a day-to-day basis in order to perform specific actions or tasks. Optimal team functioning denoted the best or most favourable way that team members worked together" (Collins & Durand-Bush, 2015b, p. 3).

The Role of the Coach

A number of descriptors alluding to the role of sport coaches can be found in the literature. For instance, coaches have been described as "educators, administrators, leaders, planners, motivators, negotiators, managers, and listeners" (Giges et al., 2004, p. 431). They are also said to perform the role of therapist, scientist, and confidant (Lyle, 2002). Cassidy, Jones, and Potrac (2009) described effective coaches as experienced, flexible, organized, and good people managers. Furthermore, high performance coaches are experts in the technical, tactical, physical, mental, and organizational aspects of their sport (Côté, Yardley, Hay, Sedgwick, & Baker, 1999; Thelwell, Weston, Greenlees, & Hutchings, 2008).

Lyle (2002) postulated that coaches typically have four functions: directing interventions, supporting interventions, managing constraints, and strategically coordinating the coaching process. These functions involve a variety of actions such as providing feedback and instruction (i.e., directing intervention), planning training sessions, performing administrative tasks, and counselling athletes (i.e., supporting interventions), seeking sponsorship and managing

equipment (i.e., managing constraints), and monitoring and evaluating the coaching process (i.e., strategically coordinating the coaching process). However, Lyle's perspectives appear to stem from his own experiences in coaching, as no literature was referenced to support the functions he discussed. Furthermore, no known studies have investigated these functions to report how coaches actually perform them in their day-to-day coaching practice.

On the other hand, Côté and colleagues (1995) conducted a grounded theory study with expert gymnastics coaches, leading them to propose a coaching model in which they showed that coaches exert influence in three areas: competition, training, and organization. Specifically, they found that coaches: (a) supported athletes during competitions to help them perform to the best of their abilities (e.g., by assisting them at the competition site); (b) trained athletes to help them develop the necessary performance skills (e.g., by using progressions and developing technical, tactical, and mental skills); and (c) organized the environment to create optimal performance conditions (e.g., by planning training sessions and supporting athletes).

Côté and colleagues' (1995) coaching model is unique in that it is a sport-specific model of expert gymnastics coaches' knowledge grounded in their lived experiences. However, even though some studies showed its relevance in the context of team sports (Bloom & Salmela, 2000; Gilbert & Trudel, 2000), it may not account for coaching practices and intricacies across all team sports. As Lyle (2002) noted, "particular attention should be given to team sports…. The coaching process in these circumstances often appears to be 'untidy'" (p. 48). What is more, only coaches' perceptions contributed to the development of Côté and colleagues' (1995) model, and it particularly focused on knowledge rather than concrete actions or processes.

Studies have also shown that coaches play a role in optimizing team functioning. For instance, Bloom and colleagues (2003) reported that coaches felt it "was their job to facilitate,

moderate, and supervise the team in order to keep them functioning in the desired direction" (p. 136). Coaches have contributed to team functioning by planning social activities (Bloom et al., 2003; Pain et al., 2012; Turman, 2003), inspiring leadership (Pain et al., 2012), setting goals with athletes (Collins & Durand-Bush, 2014; Turman, 2003), encouraging effective communication (Collins & Durand-Bush, 2014), and mediating conflict resolution (Holt, Knight, & Zukiwski, 2012). That said, how coaches fulfill such roles is not well understood.

Finally, while coaches exert influence in many ways and in different contexts, they themselves are influenced by the characteristics of their athletes (e.g., age and level of experience) as well as their own personal characteristics (e.g., personality, experience/ability, values, coaching philosophy, Côté et al., 1995). As Nash, Sproule, and Horton (2008) found, coaches with more experience and coach training typically adopt a more holistic coaching philosophy, which is reflected in their roles (e.g., to facilitate the development of the athlete versus to pass on knowledge). Consequently, effective coaches must be able to "align their own competencies such that they are congruent with the needs of their athletes and the context in which they work" (Côté, Young, North, & Duffy, 2007, p. 6).

The Role of the Coach in High Performance Curling

Coaching in the context of curling has been largely under researched (Gilbert & Trudel, 2004). This context is unique as teams are comprised of four or five athletes (i.e., lead, second, third, skip, and sometimes an alternate player), and often, but not always, a coach (Curling Canada, 2015b). Anecdotal evidence suggests that the roles of coaches and athletes can vary from one team to the next, and are idiosyncratic in comparison to that in other sports. For example, coaches' primary influences are exerted before and after games and during training, since they cannot interact and communicate with team members during games at all, except

during scheduled breaks and restricted time-outs. Thus, athletes must be highly autonomous and self-directed. Curling coaches' responsibilities, to name a few, include providing technical and tactical assistance, monitoring athletes' performance via statistics, debriefing games, scouting the ice and rocks, and facilitating communication (Collins & Durand-Bush, 2010, 2014).

In high performance curling, the level of involvement and tasks performed by coaches seem to differ from one team to the next. For instance, Paquette (2009) reported that as curling teams increase in skill and experience, the role of the coach often becomes increasingly passive. Contrarily, a former National Development Coach recently stated in an online curling blog: "Coaching has never been more a part of the sport of curling than it is right now. It just looks different" (Tschirhart, 2014). Tschirhart (2014) noted that curling coaches might play over 20 different roles, however, only two were cited (i.e., transportation coordinator, counsellor) and these were based on anecdotal evidence. Similar to the rest of the literature on coaching, very little is known about the different roles that coaches play to optimize team functioning in curling. Given the small size of curling teams, which underscores the importance of members effectively working together to achieve desired outcomes, this context is a valuable one in which to examine what coaches do to help teams operate and perform.

Purpose of the Study

The present study was part of a larger research initiative in which factors and strategies contributing to the development and maintenance of optimal team functioning in high performance curling were investigated (Collins & Durand-Bush, 2015a, 2015b). The current study focused exclusively on uncovering the various roles of curling coaches in the process of developing high functioning teams based on the perceptions of both coaches and athletes. It also

gives insight into what characterizes the roles in order to help coaches negotiate the different tasks they can perform within curling and effectively accomplish them.

Methods

Constructivist Grounded Theory

This study was conducted using a constructivist grounded theory approach. Grounded theory is a method of inquiry whereby a researcher "seeks to construct theory about issues of importance in peoples' lives" (Mills, Bonner, & Francis, 2006, p. 2). Grounded theory is developed from the bottom-up, meaning that data collection and analysis are inductive (Mills et al., 2006) and grounded in the participants' experiences under study. The constructivist variant was chosen as it places the interaction between the participants, the researcher, and the social world at the forefront, and presents the theory as a co-construction (Charmaz, 2006). Consistent with this variant, flexible rather than rigid parameters guided the iterative and dynamic research process. Although data collection and analysis steps were followed (Holt & Tamminen, 2010), the process was nonlinear. The aim of the grounded theory was to construct a model reflecting actions to guide coaches and athletes in optimizing team functioning. As noted by Glaser and Strauss (2010), theory "should be able to give the practitioner understanding and some control of situations" (p. 3). Investigating the different roles that coaches play through the lens of grounded theory will help increase their understanding of how they can lead teams to optimally function and perform.

Participants

Participants were members of 19 high performance curling teams (N = 78 athletes) and their coaches (N=10). At the time of data collection, not all teams had coaches and other coaches were unavailable for participation. In total, there were 12 women's teams and seven men's

teams, and all of the coaches were men. In order to meet the selection criteria of high performance, only teams "identified through competitive achievement, as having the potential skill, ability and interest in competing at the national and international level" were selected for participation (Curling Canada, 2013, p. 3). Recruitment was carried out with the help of Curling Canada's High Performance Director who contacted teams who met the selection criteria and sent them a recruitment invitation. Interested teams then arranged a time to meet with the researcher at a training camp or competition for a face-to-face focus group interview. Following this, the researcher contacted the teams' coaches to conduct a telephone interview, which was more practical for them given their hectic schedule.

Data Collection and Analysis Process

Data collection and analysis were consistent with the following characteristics of constructivist grounded theory studies (Charmaz, 2006; Holt & Tamminen, 2010; Mills et al., 2006): (a) interviewing (b) data transcription, (c) researcher reflexivity and memo-writing, (d) data coding, (e) multiple coder checking, (f) verification and re-coding of data, (g) model development, and (h) model verification. Steps that were particularly relevant to examine the role of coaches in the current study are presented next, however, for a detailed description of all steps undertaken in the larger research project, refer to Collins and Durand-Bush (2015b).

Interviews. Each team comprising of four athletes (five for those who had an alternate) first filled out a demographic questionnaire, after which they engaged in a semi-structured face-to-face focus group interview. The coach was intentionally excluded from the interview in an effort to create a climate conducive to open and honest communication and sharing. Interviews lasted an average of 65 minutes and although several questions were asked, those pertaining to this particular study included: 1) What role does your coach play in optimizing team functioning

on this team? 2) How does your coach help or hinder your ability to work and interact effectively with one another? Following the interview, the athletes completed an exit questionnaire, which provided them with the opportunity to voice, in confidence, different perceptions than those discussed in the focus group interview. Coach data, on the other hand, were collected via a demographic questionnaire and an individual telephone interview. Interview questions were similar to those posed to the athletes, yet adapted to explore the coaches' perceptions and experiences. These interviews lasted on average 85 minutes.

Data transcription and coding. All focus group and individual interviews were transcribed verbatim and emailed to the participants for authentication. In keeping with the iterative nature of the research process, follow-up questions were sometimes emailed to participants along with their transcript and their additional responses were integrated into the data. Following authentication, the transcribed data were broken down into meaning units that were coded based on the content/research questions/interview guides and categorized under the first order theme entitled "roles". Data were further coded into second (e.g., technical/tactical specialist), third (e.g., on-ice) and fourth-order (e.g., time-outs) themes, and grouped using constant comparison (Charmaz, 2006). All data were entered into NVivo to organize and facilitate data retrieval.

Multiple coder checking, verification, and re-coding of data. Multiple coder checks were carried out with the supervisor throughout the data collection and analysis process. Furthermore, two doctoral students independently coded a sample of the data to explore alternative ways of interpreting the data and address potentially competing explanations (Barbour, 2001). All of this contributed to the lead researcher's ongoing reflection on the data and creation of memos to keep track of evolving thoughts, which allowed her to explore her

"research experience, decisions and interpretations" (Charmaz, 2006, p. 188). Memo topics included new ways of asking interview questions, additional probes to use, and insight into how the data 'fit' together. As constant comparison led to new insights and perspectives, all data were coded and re-coded a minimum of three times.

Results

Results revealed that the coaches played the following five major roles within the context of high performance curling: technical/tactical specialist, mediator, facilitator, manager, and motivator. These were based on coaches and athletes' perceptions of the roles that coaches played on their current and previous teams, or what they should ideally play, for example, based on the specific team characteristics or the culture of high performance curling in general.

Technical/Tactical Specialist

The most commonly highlighted role was that of a technical/tactical specialist. For instance, one coach described himself as an expert on the "technical and tactical side of things…the nuts and bolts of curling" and the "sport-specific knowledge of the game" (C1). This role consisted of helping team members with their game plan or strategy, collecting and sharing statistics, and providing technical feedback or assistance. One athlete described, "He's a technical tactical [coach], like…'these are the stats, this is what you need to do and you'll win'" (M1-4).

For the most part, coaches fulfilled this role in competition by helping with strategic decision-making and by collecting statistics. They helped with strategy prior to games, for instance, by discussing "how [opponents] play, how we're going to react to their strategy, and how we should play the game" (C8), and also by providing a second opinion during time-outs.

Another important aspect was to be "there for games and competitions to observe and take all of that data and information and bring it back to our practices" (W6-4).

During training, coaches used performance data to tailor practices to the team's needs, for example, by planning more draw drills, or working on slides or brushing. Most coaches interacted with their athletes a great deal in practice: "As far as practices, it's really important…vital, really, for me to be there to watch them throw because that's where you do all your technical work and alignment and line of delivery" (C9). One team also noted that during training, the coach helped them become more aware of one another's technical tendencies: "When we were on the ice this morning, he was really…trying to point out each other's tendencies and have us each understand each other... So technically I think he's bringing a lot" (W5-3).

Overall, many teams felt that having a coach in the technical/tactical role was beneficial: "Coming from not having a coach or having coaches that didn't provide that, that's one of the largest assets that I get out of having [coach]!" (W6-3). That said, some teams did not want their coach to play this role. For example, one team stated that they had reached a point in their career where they had become un-coachable: "We've learnt all we're going to learn… We, in some ways, are transcending the game and how we play it…. We're four smart guys at the game, so we can figure that all out" (M5-3). Another team stated that their coach "doesn't really believe in telling men's teams how to play the game" (M6-4). They speculated that this was because men's teams do not listen very well, and because the game had changed a lot since their coach played it himself.

Mediator

Another prominent coach role was that of a mediator. Typically, this role was enacted in response to interpersonal issues or tensions, and often contributed to problem solving or conflict resolution. Coaches mediated conflict on both an individual and team level. For instance, on an individual level, coaches often diffused situations by allowing their athletes to vent their frustrations and by being "the voice of reason" (M2-3). One team shared, "I'll talk to [the coach] if I'm concerned that [this athlete] is throwing her in-turn like garbage…and then [the coach] will be like, 'well no…it's not that bad' and talk me out of it" (W7-4). In addition, coaches were influential in helping their athletes determine how best to solve their own problems, for example, by helping athletes "strategize on how you're going to have the conversation" (W4-1). One team noted that coach mediation was particularly helpful when getting to know new players.

Coaches also mediated conflict by intervening on a team level. One coach discussed his role in team mediation:

> I don't want to be the sounding board with them and just leave it there so they can come and [complain] to me. Then I'm the only one who knows the secret. They know that if they come to me, eventually I'm going to do something, whether I'm going to go to that person and try to change her behaviour without her knowing why…so behaviour changes that bother them, or I will create a confrontation. But I'll try to create it in a way that both groups don't feel offended and that it's coming from me… I'll say, 'I observed this on the ice. We need to talk about it.' (C5)

As alluded to in the previous citation, several coaches mediated conflict in a way that made it seem like it was coming from them and not from other players. As such, teams noted that when issues needed to be addressed, it was often easier to go through the coach: "That's when we're

happy to have our coach as a part of the team. You can get it done through him. Because…we're all equal team members, and it's hard to tell somebody else something like that" (W12-4). One athlete described his coach who filled the role of mediator as "a tool that doesn't ruin our dynamic" (M7-3).

To illustrate the importance of this role of mediator, one athlete expressed that if her coach had not fulfilled that role in the previous year, "I don't think we would have been together this year" (W2-2). However, not all coaches played the role of mediator. One team noted that addressing interpersonal conflict was outside their coach's competencies:

> If there's a contentious issue on the team, [coach] is not going to sit down and be like, 'okay ladies, we've got to sort this out.' He's not going to do it.… We need to figure that out on our own. That's not a role that he's comfortable playing, and I don't think we want to ask somebody to do something that they're not comfortable doing. (W6-3)

This suggests that the role of the coach is dependent on not only the needs of the team but also the personal characteristics and competencies of the coach.

Facilitator

In addition to mediating conflict, coaches also played the role of a facilitator. Facilitating involved enabling or assisting in implementing a number of team processes including decision-making, role clarification, and communication. As one coach stated, "they look to me more for facilitation, [a] trouble shooter, outside pair of eyes" (C2). Asking questions and encouraging discussion appeared to be key strategies to perform this role: "If I can sit around the table with the team and ask hard questions and facilitate the answers then I think that's good enough for me" (C3). As one athlete stated, "Coaches need to facilitate the discussion of team dynamics within high performance teams to best maximize their players' potential. I would say that they

shouldn't lead this conversation once started; only keep it moving forward" (M1-1). In this sense, coaches provided structure to communication during team meetings and post-game debriefs and they knew when to step in and out. One team spoke about how their coach hindered their functioning by not playing the role of facilitator: "He just doesn't facilitate anything. Like if he was to start a conversation and get the ball rolling, we'd be pretty good at keeping it going" (W3-4). This team of athletes identified that the coach "just doesn't really know what to…say [in some situations]" (W3-3), which suggests that while athletes may perceive a role to be important, coaches may lack the knowledge, skills, and experience necessary to fulfill this role.

Coaches and athletes' perceptions regarding the coach's role as facilitator varied, including the topics that coaches should facilitate. For instance, one coach felt that "anytime it has something to do with the task, it's the coach's role" (C1). In contrast, athletes described the coach as someone who helps them interact, yet they were "leaning towards an outside person to deal with any sort of facilitating" (W5-4). These discrepancies highlight the need to clearly define the role of coaches and their responsibilities.

Performing the role of facilitator was also based on the age and level of athletes: "When I work with [mature athletes], I tend to watch and listen lots and talk less…. So I tend to be less of a directing coach and more of a facilitating kind of coach" (C3). Another coach noted that when he coached at the Junior level, he provided athletes with a lot of necessary information, but with his current adult high performance team, he tends to ask questions: "They have the tools at the level they play at to be able to come up with answers to those kinds of questions" (C2).

Manager

An additional role discussed by the coaches and athletes was that of manager: "A coach…is someone who manages all of the out-of-game situations to best prepare the players for

the game situations" (M1-1). In line with managing, another team spoke of how important it was for the coach to keep things organized: "He'll line up our practices and just send emails and kind of catch up and see what we're thinking and what we've been up to" (M7-3). Thus, a key part of managing involved performing duties that provided organization and structure to the team:

> Structure is important to them… It's my job to make sure we do certain things…so from a management perspective, how do we meet, when do we meet, what do we say, where do we go, on or off the ice. (C6)

Support for this role in the context of competitions was evident: "I think part of the coach's role is knowing those details that you need, like you don't have to clutter your brain with, 'we're on this sheet at this time, and two o'clock we're going to meet [here]'" (W11-3). The role of manager also consisted of planning and organizing practices, charting opponents and rocks, and performing administrative tasks. For example, some coaches booked hotels, ordered uniforms, and contacted event organizers on behalf of the team. Coaches who played this role were clearly appreciated:

> [Coach] has been very helpful in getting things done…and supporting us in any way. I think it has a great effect on our performance because it allows us to be able to focus on our game and not have to worry about the little details. I believe it makes us feel relaxed and it is nice to have someone to take things off our shoulders. (W3-2)

Finally, in addition to tackling organizational and administrative tasks, a few coaches also spoke of their role in managing the overall team. As one coach stated, "I don't think you're much of a coach if you can't manage the… team, at least on some level. And I don't mean manage their travel arrangements, I mean manage their…[performance]" (C1). Interestingly, no athletes referenced any disadvantages of having a coach fulfill the role of a manager.

Motivator

A final common role that was described by coaches and athletes was that of a motivator. This role mainly consisted of encouraging, supporting, praising, and inspiring team members to train, perform, and effectively work with one another, as indicated in the following citation:

> I think part of being a coach is [being] a motivator - you have to try and get the best out of their performances by motivating them… I know I had a big role in motivating them to be prepared… And then dealing with the dynamics of the team when they're down or when they're up, you know, finding a balance. (C4)

Coaches motivated their athletes by giving pep talks, using confidence-enhancing language and cue words, providing praise and positive reinforcement, celebrating successes, and showing commitment and unconditional support. As one team put it, "We see how much [Coach] loves us and loves the game, so for us that's a motivator… In the heart of winter, we're out practicing at 9 o'clock and he's there holding the broom. Like it's all those little things" (M5-3). One team shared the importance of motivating team members based on personal needs and preferences. They completed an individual psychological assessment, which informed the coach on how to motivate each athlete: "I think [Coach]'s made a point of figuring out what makes each person get motivated…. Like how to challenge or pat certain people on the back the right way to get them in the right spot" (M3-4). Another coached discussed how he used praise and encouragement to promote adaptive changes in his athletes:

> I'd rather encourage them to make that little change or adjustment in how they're doing things and then remind them…Follow-up whenever I see it, praise them for doing it and tell them how I see this happening, and how I can see it's helping the [lead] or [second]. (C9)

One coach differentiated between being a motivator and cheerleader: “My personality and coaching style is not that of a cheerleader. Certainly positive reinforce[ment] but not a particular cheerleader or raw-raw kind of person” (C3). The way that coaches played the role of motivator was thus influenced by their personal characteristics.

Discrepancies and Changes in Roles

Coaches differed in regards to how they perceived and prioritized their roles. For instance, while one coach described himself first as a technical/tactical specialist and secondly as a mediator, another coach prioritized these two roles but the opposite way. Moreover, coaches’ roles were not static; they were dynamic and changed based on a number of factors, including team attributes and the context. For instance, one coach noted that his role evolved in an effort to respond to team challenges:

> Originally my role when I came in was for the technical/tactical aspect of it. They had a sport psych[ology] person with whom they had worked for a while, and from my perspective, it was great that I didn’t have too many roles... and could just focus on their performance.... Unfortunately, that seems to be our falling - the team dynamic aspect of things. The idea that the communication breaks down. (C5)

Thus, in this case, the coach adjusted his primary role to also adopt that of a mediator and facilitator in an effort to respond to the needs of his team.

Interestingly, roles were not always defined by coaches: “In curling, because the players typically decide on everything and then bring a coach in at the end, they define what they want and don’t want from a coach” (C1). Furthermore, roles were sometimes not clearly defined:

> If I don’t know what they want from me, there’s a high risk that I will disappoint them in terms of what I am delivering and there’s also a high risk that I won’t…move the bar….

> Not only will they be disappointed because they're not getting what they want from me, but they're not going to get what they want in terms of results either because I'm not adding to it…. I've got 20 some odd years of experience, I know what I think I should be doing! But I don't know if that's what they think I should be doing. And so I need to have that conversation with them…. I sometimes question, 'what do I bring to the table?'"(C6)

A number of coaches felt that in order to optimally function, team members "have to lay out to the coach exactly what his role is going to be" (C7).

Discussion

Coaches in the present study performed five primary roles: technical/tactical specialist, mediator, facilitator, manager, and motivator. Although four of these roles (i.e., technical/tactical specialist, mediator, manager, motivator) have been alluded to in the literature (Cassidy et al., 2009; Giges et al., 2004; Lyle, 2002; Thelwell et al., 2008), the role of the coach as a facilitator has not been particularly addressed. A detailed investigation of how most roles have been performed in different sporting contexts is lacking (Lyle, 2002). Instead, much of the research has focused on observable coaching behaviours exhibited in competition and training, the most common of which has been providing technical feedback and instruction (Cushion, 2010). These latter behaviours can be linked to the role of technical/tactical specialist. For example, coaches in the current study provided technical assistance to athletes mainly during practices and they helped them to strategize particularly before games. In addition to the role of the technical/tactical specialist, the present study corroborates some of the previous research suggesting that coaches play a role in managing human and physical resources (Lyle, 2002) and the environment to create optimal performance conditions (Côté et al., 1995), and motivating athletes to perform by showing support (Côté et al., 1995).

Two roles highlighted in the present study that have received substantially less attention in comparison to the roles of technical/tactical specialist, manager, and motivator are those of mediator and facilitator. Giges and colleagues (2004) noted that coaches can act as negotiators, which has common elements with the role of mediator. Yet, research on coaching and problem solving has focused on how coaches themselves solve problems (e.g., by examining the issues and gathering all of the necessary facts before taking action; Schempp & McCullick, 2010) or on how they manage conflict in coach-athlete relationships (Rhind & Jowett, 2010). Studies have neglected how coaches help their athletes resolve their own issues. In the present study, coaches played a key role by acting as mediators, which involved letting their athletes vent, sharing their opinions, and brainstorming possible solutions. Coaches only intervened as necessary and strategically took responsibility for raising issues to protect athletes' relationships. The role of mediator was most often enacted in response to interpersonal problems or conflict rather than performance-based conflict, the former of which researchers have identified as more destructive and difficult to resolve (Holt et al., 2012).

Mellalieu, Shearer, and Shearer (2013) found that world class athletes deal with interpersonal conflict by talking with others about the conflict, or by actively trying to resolve an issue with the help of a colleague. Unfortunately, no insight was provided as to *who* helped athletes in this process. On the other hand, Holt and colleagues (2012) examined female athletes' perceptions of conflict with teammates and found that coaches were active agents in mediating conflict. However, coaches were approached only as a last resort, especially when the conflict was related to interpersonal relationships, as the athletes preferred to seek assistance from senior players/captains or a mental performance consultant. These findings are different than those elicited from coaches and athletes in the current study, as a number of teams sought help from

their coach right away to deal with interpersonal issues. One potential reason for this is that the athletes in Holt and colleagues' (2012) study were members of large sport teams (e.g., ice/field hockey, volleyball), which could arguably limit the closeness and cohesiveness between coach and athletes (Carron, Hausenblas, & Eys, 2005). In small teams such as those in the sport of curling, it seems logical that coaches would have developed closer relationships with team members and have open lines of communication (Jowett, 2007) to permit the mediation of conflict. In fact, when the team size is small, coaches likely "have more and better opportunities to get to know their athletes and hence understand their thoughts and feelings" (Lorimer & Jowett, 2009, p. 154). Interpersonal conflict in small team sports can arguably have greater negative consequences (e.g., feelings of resentment, defensive attitudes, performance detriments; Mellalieu et al., 2013) given the limited number of members, thus researchers should further explore how coaches can effectively mediate interpersonal conflict in these settings.

Coaches in this study also contributed to optimal team functioning by performing the role of facilitator, which consisted of enabling or assisting athletes in implementing various team processes such as communication. Although Bloom and colleagues (2003) did not provide many details, they reported that expert coaches in their study believed it was their job to "facilitate, moderate and supervise the team in order to keep them functioning in a desired direction" (p. 136). However, the notion of supervision was not addressed in the current study, possibly because high performance curling athletes are typically highly self-directed and generally oversee their activities. Bloom and colleagues (2003) further alluded to coaches' role as facilitator by stating that coaches were responsible for "providing a little bit of steerage to the ship but letting someone else actually handle it" (p. 137). This was consistent with coaches in the present study who de-emphasized any idea of control. The notion of facilitating, as opposed to

directing team processes, is congruent with research suggesting that coaches can assist learning through 'guided discovery' (Cassidy et al., 2009). Guided discovery is an athlete-centered approach wherein coaches assist learning and development by empowering athletes and asking meaningful questions, as opposed to giving them answers. Results of this study clearly show that high performance curling coaches favour guided discovery over autocracy. Because the role of facilitation was not embraced by every coach, perhaps given their limited competencies in this area, it would be important to provide coaches with opportunities to learn how to facilitate team functioning processes, particularly since this role was appreciated by athletes.

Interestingly, according to the National Coaching Certification Program (NCCP), high performance curling coaches in Canada are trained in six areas: (a) teaching/learning strategies, (b) strategy/tactics, (c) delivery and brushing skills, (d) skill analysis, (e) practice planning, and (e) drills to correct (Curling Canada, 2015a). This certification undoubtedly addresses the role of being a technical/tactical specialist, however, it does not appear to nurture the other four roles of mediator, facilitator, manager, and motivator identified in this study. Consequently, additional education and training opportunities for coaches should be included in order to advance the sport of curling and prioritize coaches' roles in helping teams effectively work together and achieve desired outcomes. This could be accomplished by providing coaches with formal learning opportunities, for instance, with the addition of a specific module into the existing NCCP curling coach certification program, or by giving coaches access to workshops or seminars. Alternatively, informal learning opportunities could be created through mentoring and ongoing dialogue between coaches, or between mental performance consultants and coaches.

Although the current study is novel in that no empirical findings on coaches' roles in curling exist, and clear implications for practice have been put forth based on the findings, it

nonetheless bares limitations. For example, coaches and athletes were interviewed separately to promote more open discussion regarding how coaches contribute to and hinder team processes. Furthermore, in order to ensure confidentiality, no direct comparisons between coaches and their athletes were reported. This restrained the discussion on congruency of perceptions between coaches and athletes. Finally, this study was limited to the sport of curling. Although the coaching roles identified in this study may be relevant in other contexts, more research must be conducted to validate this. It is hoped that findings from the present study will be a starting point to more concretely explore the role of coaches in high performance curling and other sports in order to optimize both coach and athlete behaviours and functioning. Ultimately, "understanding which [coach] behaviours translate into positive experiences and functioning on the part of the athletes is critical for research and practitioners" (Cushion, 2010, p. 44).

Concluding Remarks

In conclusion, high performance curling coaches played five major roles in optimizing team functioning, which included technical/tactical specialist, mediator, facilitator, manager, and motivator. While both coaches and athletes saw value in each of these roles, they were interviewed separately; thus, it is difficult to determine if coaches and athletes perceived the importance and characteristics of these roles the same way. Roles were dependent on athletes' needs as well as both coaches and athletes' personal characteristics and competencies. In order for coaches to effectively help teams manage functioning and achieve desired outcomes, specific training should be provided as both coaches and athletes reported that skills to successfully perform roles were sometimes lacking.

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PART IV

General Discussion

This dissertation had two general aims. The first aim was to critically review theoretical/conceptual frameworks in the literature directly or indirectly addressing team processes in sport and derive implications for professional practice (Article 1). This was an important first step to get a thorough understanding of the merits and gaps of existing frameworks in the literature. This not only allowed the researcher to clearly situate and justify the second aim of the research but also to go back to the results of this critical review in this general discussion to compare and contrast findings. Based on the gaps identified in the literature pertaining to studies and frameworks targeting team dynamics, team cohesion, team building, team processes, and coaching, the second aim of this research was to use a grounded theory research approach to investigate (a) factors that contribute to the development and maintenance of optimal team functioning within high performance curling (Article 2), (b) strategies used by high performance coaches and athletes to optimize team functioning (Article 3), and (c) specific roles that curling coaches play in this process (Article 4).

This general discussion chapter is divided into four sections: (a) integration of empirical findings resulting from this research, (b) theoretical, methodological, and applied contributions of this research, (c) limitations, and (d) recommendations for future research and practice.

Integration of Empirical Findings

The OTF model: A comprehensive grounded theory model. A critical review of frameworks of team processes used to guide research and/or practice in sport revealed that to date, seven frameworks have provided insight into team functioning in sport (Collins & Durand-Bush, 2015a). These frameworks [Theory of group development (Tuckman, 1965; Tuckman &

Jensen, 1977); Theory of group productivity (Steiner, 1972); Personality-based preference framework for team communication (Beauchamp, Maclachlan, & Lothian, 2005); Framework for examining the correlates of cohesion (Carron, 1982); Conceptual model of cohesion (Carron, Widmeyer, & Brawley, 1985); Conceptual framework of team building (Carron & Spink, 1993; Prapavessis, Carron, & Spink, 1996); Social-cognitive framework of team coordination and communication in sport (Eccles & Tenenbaum, 2004)] have explicitly or implicitly addressed the importance of several related factors and processes including roles and norms, personal and team attributes, and communication (Collins & Durand-Bush, 2015a). That said, the aforementioned frameworks are limited for several reasons, the most notable of which is their lack of comprehensiveness (Collins & Durand-Bush, 2015a). For instance, of the frameworks included in the review, Tuckman's theory of group development (1965; Tuckman & Jensen, 1977) addressed the most general themes (N=7, e.g., roles) and broader team processes (N=12, e.g., adapt/fulfill roles; Collins & Durand-Bush, 2015a). However, on average, the seven frameworks targeted only five general themes and six broader team processes (Collins & Durand-Bush, 2015a). Consequently, they neglected to attend to numerous vital team processes. As an example, problem solving and support were not addressed in any of the frameworks, yet the importance of these processes has been highlighted in the literature, including in a recent conceptual framework for teamwork and team effectiveness (McEwan & Beauchamp, 2014). This multidimensional framework of teamwork and effectiveness in sport was predominantly drawn from the organizational psychology literature and was not included in the aforementioned review as it has yet to be used in sport psychology research or practice. However, "it shows great promise given its emphasis on a variety of teamwork behaviours (i.e., team processes) that can be nurtured over time and across contexts" (Collins & Durand-Bush, 2015a, p. 13).

One possible reason for the limited comprehensiveness of frameworks is that they have been developed based on the literature (i.e., deductive reasoning) rather than the actual experiences of coaches and athletes in a given context (i.e., inductive reasoning). For instance, Carron and Spink's (1993) conceptual framework of team building has been used as the basis for numerous team building studies in sport. However, when presenting their framework for the first time, they gave very little information regarding how it was developed; they merely referenced a textbook, written by the first author, stating, "some specific factors identified as contributing to the development of cohesiveness were presented" (Carron & Spink, 1993, p. 11). It is plausible that had they adopted a more inductive approach when developing their framework, additional factors may have been apparent and included.

The aforementioned frameworks lack not only comprehensiveness but also practical implications to apply targeted team processes. Factors and processes were often ill-defined, as were ways in which to implement them in applied settings (Collins & Durand-Bush, 2015a). For instance, Tuckman (1965) indicated that teams undergo a period of *forming* wherein teams:

> Concern themselves with orientation accomplished primarily through testing. Such testing serves to identify the boundaries of both interpersonal and task behaviors. Coincident with testing in the inter-personal realm is the establishment of dependency relationships with leaders, other group members, or preexisting standards. (p. 396)

Inferences had to be made to operationalize 'orientation', 'dependency relationships' and 'testing' constructs and draw implications for practitioners (Collins & Durand-Bush, 2015a).

Additionally, while research shows that team effectiveness and cohesion are influenced by the context or environment (Carron, 1982; Carron & Spink, 1993; McEwan & Beauchamp, 2014), to date, no frameworks of team processes are sport or context-specific. Consequently, this

may limit both our understanding and ability to help teams achieve optimal functioning and desired outcomes in a given context.

The current study was conducted in an effort to address these gaps and led to the development of the OTF model. The OTF model is a comprehensive, theoretically grounded, sport-specific, readily applicable framework that depicts key attributes and processes deemed necessary by high performance curling coaches and athletes for optimal functioning. The model addresses eight components: (a) Individual Attributes, (b) Team Attributes, (c) Foundational Process of Communication, (d) Structural Team Processes, (e) Individual Regulation Processes, (f) Team Regulation Processes, (g) Context, and (h) Desired Outcomes. Within the six core components of the model, four attributes (e.g., individual sport competencies and characteristics, relationship characteristics) and 17 processes (e.g., communicate, set goals, exert self-control, support) are included, some of which have been explicitly or implicitly addressed in existing frameworks (e.g., personal and team characteristics, communication, roles/norms, Collins & Durand-Bush, 2015a). Furthermore, the model comprises two peripheral components (i.e., context, desired outcomes), which have also been explicitly or implicitly discussed in some existing frameworks. That said, many of the processes in the core components in the OTF and the way they were grouped and linked, are novel (e.g., clarify expectations, exert self-control, take responsibility, support, make decisions). The emergence of processes not traditionally presented in existing frameworks was likely due to the inductive grounded theory approach used to carry out the study (Charmaz, 2006). It permitted a flexible but thorough investigation of the perceptions and experiences of coaches and athletes, and led to new insights (Creswell, 2007). When examined in relation to the same criteria used to review frameworks in Article 1 (Collins & Durand-Bush, 2015a), it is evident that the OTF model is far more comprehensive as it

addresses *all* general themes (N=10). Moreover, it speaks to an additional theme not present in any of the existing frameworks, that is, self-regulation, which will be subsequently discussed. The OTF model also focuses on 21 broader team processes (e.g., identify personal characteristics, communicate, set goals, remain aware, lead), in comparison to the average number of six processes addressed in existing frameworks. Thus, the model provides new knowledge regarding the array of processes and actions necessary for optimal functioning in high performance curling.

The current study also addressed a key gap regarding the application of theory. Strategies used by coaches and athletes to optimize team functioning were linked to each component of the OTF model, which facilitates and provides structure to the implementation of team processes. This also contributes to a greater understanding of the relationships between components of the OTF model and applied strategies. For instance, if a coach notices that athletes are blaming one another for mistakes, by examining the OTF model in Article 2, he can recognize that this lack of accountability (i.e., take responsibility) may be apparent for several reasons, such as a lack of respect for teammates (i.e., relationship characteristics), a lack of clear objectives (i.e., set goals), an absence of norms (i.e., create norms), and/or insufficient self-awareness (i.e., remain aware). Then, by examining the list of strategies presented under 'Take Responsibility' in Article 3, the coach can select an appropriate intervention method. If blaming is occurring because athletes are not aware of their own errors, for example, the coach may decide to reaffirm goals (i.e., set goals) with team members, evaluate their performances (i.e., take responsibility), and share observations (i.e., remain aware). Given that coaches were shown to play a key role in facilitating team functioning (Collins & Durand-Bush, 2015d), these findings may be a key resource to help them be effective in this area.

The OTF model: A hierarchical model. As previously mentioned, a critical review of frameworks revealed that several processes are important for effective team functioning (Collins & Durand-Bush, 2015a). However, the order in which processes should be addressed when helping teams operate more effectively is not clear. For instance, the conceptual framework of team building (Carron & Spink, 1993) shows a linear representation of components wherein the group environment (i.e., distinctiveness) and group structure (i.e., group norms, group positions) influence team processes (i.e., interaction, communication, sacrifices), and these team processes have the most direct impact on the development of cohesion. However, the authors failed to provide clear guidelines for implementing any of these components or processes when working with teams. Similarly, it can be inferred from Tuckman's (1965; Tuckman & Jensen, 1977) linear theory of group development that team functioning should potentially be addressed by first identifying tasks and contexts and establishing relationships and norms, however, the authors did not discuss any applications in their work, let alone a hierarchy to guide this process. A similar observation can be made regarding Steiner's (1972) theory of group productivity, which suggests that actual and required resources such as team members' knowledge and skills should be identified first, yet both practical implications and the sequence to follow when applying processes were not articulated in their research.

In the OTF model, team functioning refers to a series of hierarchical processes by which team members work together and operate on a day-to-day basis in order to perform specific actions or tasks. These processes are reciprocally influenced by individual and team attributes, all of which form the core of the model. The context and desired outcomes are peripheral components that mutually influence the core of the model. Furthermore, communication forms the foundation of most other processes in the model, and structural team processes help guide

individual and team regulation processes. Consequently, the hierarchical nature of components, processes, and attributes in the OTF model can help coaches, athletes, and practitioners sequence and periodize their work with teams.

Indeed, scholars have suggested that periodizing mental training is a key means to enhancing performance excellence (Holliday et al., 2008; Lidor, Blumenstein, & Tenenbaum, 2007). However, the focus of periodization has predominantly been on developing individual mental skills, with little attention paid to team processes (Holliday et al., 2008; Lidor et al., 2007). Holliday and colleagues (2008) noted that a standardized periodized training cycle typically involves four phases: preparatory, competitive, peak, and recovery. Based on the hierarchical nature of components, processes, and attributes in the OTF model, it would be important to address the following in the **preparatory phase**:

(a) Create a solid team foundation by *prioritizing the development of communication skills* given that communication is required for understanding individual and team attributes, creating an effective team structure, engaging in most individual regulation processes, performing all team regulation processes, effectively adapting to changing contexts, and monitoring desired outcomes;

(b) *Assess individual and team attributes* as these influence all other components of the OTF model but they particularly impact the effectiveness of communication (e.g., tone, timing, content, adapted to preferences) and the team structure (e.g., goals determined based on team members' competencies);

(c) *Develop an effective team structure* by selecting team members, setting goals, establishing roles, creating norms, and clarifying expectations. These team processes must be executed early on in a season and periodically revisited as needed throughout

subsequent phases because they form the structure for ongoing individual and team regulation processes.

During the **competitive phase**, efforts should be made to:

(a) Monitor and enhance individual (e.g., confidence, technical skills) and team (e.g., collective trust, tactical strategy) attributes as needed as these can change as a result of evolving team functioning and performance;

(b) Develop, implement, and monitor individual (e.g., remain aware, adapt) and team (e.g., support, make decisions) regulation processes as these daily actions are deemed vital for teams to optimally function;

(c) Address and adapt to the context (e.g., arena versus club ice, unpredictable rocks) as it is constantly changing and evolving;

(d) Continue reinforcing the foundational process of communication and structural team processes;

(e) Monitor the achievement of desired outcomes and adapt them as necessary.

During the **peak phase**, the focus should be on tweaking processes and attributes, and managing the context and desired outcomes as necessary in order for teams to be successful. Finally, during the **recovery (post-season) phase**, a period of reflection should take place in order to evaluate each component of the OTF and create a plan for the following season. Recovery should also be prioritized, which will allow teams to rest and re-energize in order to be able to effectively perform during the upcoming season. Thus as can be seen, because of its hierarchical nature, the OTF model lends itself well to periodizing work with teams and ensuring that different components are addressed at an opportune time.

The OTF model: The foundational component of communication. Unique to the current research is the emphasis placed on communication in the OTF model and for the application of strategies in real life sporting contexts. Communication has been discussed in the literature (Beauchamp et al., 2005; Carron et al., 2005; Eys, Schinke, & Jeffery, 2007; McEwan & Beauchamp, 2014; Yukelson, 1997, 2010), and was described by certain scholars as being vital to team success (Beauchamp et al., 2005; Carron et al., 2005; McEwan & Beauchamp, 2014; Yukelson, 1997). This was corroborated in a few studies that showed that poor communication created significant obstacles to team functioning (Collins & Durand-Bush, 2010; Pain et al., 2012). Yet, Sullivan and Short (2011) reported that team communication in sport has not received enough research attention. Collins and Durand-Bush (2015a) confirmed this, noting that communication was only explicitly (Beauchamp et al., 2005; Carron & Spink, 1993; Eccles & Tenenbaum, 2014) or implicitly (Tuckman, 1965) addressed in four frameworks of team processes in sport. Further, only a few intervention studies have explicitly targeted communication (e.g., Bloom & Stevens, 2002; Collins & Durand-Bush, 2010; Dunn & Holt, 2004; Stevens & Bloom, 2003), often to a limited extent.

In the OTF model, however, communication forms the foundation as it was the process most referenced by coaches and athletes when discussing factors used to achieve optimal team functioning. Furthermore, it is involved in all structural team processes and team regulation processes, as well as some individual regulation processes. It is also directly associated with individual and team attributes, and impacts both the context and desired outcomes (Collins & Durand-Bush, 2015b, 2015c). Moreover, as discussed in Article 3, nearly all of the 155 strategies were contingent upon communication. Specifically, communication was either the primary focus of strategies (e.g., discuss group dynamics, talk it out) or was required to implement most other

strategies (e.g., change positions, mediate conflict resolution, weigh pros and cons) for teams to operate effectively. Only a few strategies did not rely on communication. For instance, athletes increased their awareness via journaling exercises irrespective of interpersonal communication. That said, communication also facilitated awareness, for example, by having a coach share observations (Collins & Durand-Bush, 2015b). Based on the 21 direct communication strategies that were identified (see Table 2 in Article 3), it appears to be important to structure and put in place a process for communication, understand and respect individual preferences for communication, and create a climate for open and honest communication. These elements should thus be considered when working with teams in real life settings (see section on practical implications).

Few studies have examined the role of coaches in facilitating effective team communication. For instance, Newin and colleagues (2008) noted that facilitating a team building intervention helped coaches to enhance their own communication skills, however, they did not discuss if and how coaches helped their athletes learn to communicate more effectively. Collins and Durand-Bush (2014), on the other hand, found that a coach nurtured communication in his athletes by tracking their non-verbal communication during games and using this information as a tool to encourage athletes' reflection during post-game debriefs. In another study, Ryska and colleagues (1999) found that coaches promoted open and ongoing communication between team members in order to enhance cohesion, yet how coaches promoted this communication was not discussed. As noted in Article 4, coaches played a key role in facilitating communication among athletes, particularly by asking questions and facilitating discussions. One athlete best summarized this by saying that "coaches need to facilitate the discussion of team dynamics within high performance teams to best maximize their players'

potential. I would say that they shouldn't lead this conversation once started; only keep it moving forward" (M1-1; Collins & Durand-Bush, 2015d, p. 15).

The aforementioned findings are consistent with Eys and colleagues' (2007) suggestion that "effective communication is a pivotal aspect of effective intervention strategies" (p. 109). However, communication skills are not often taught to team sport coaches and athletes and they do not develop by chance (Connelley & Rotella, 1991). Given the limited focus on communication in published team building intervention studies, it seems likely that scholars assumed that by creating opportunities for team members to interact together, communication abilities would develop. However, results of this study suggest that communication must be treated as a skill in and of itself and should be nurtured throughout a team's existence.

The OTF model: Structural vs. individual vs. team regulation processes. To date, no frameworks have addressed and differentiated between structural processes, individual regulation processes, and team regulation processes, although a variety of processes have been presented across frameworks (Collins & Durand-Bush, 2015a). Furthermore, the bulk of team building interventions to date have focused on setting goals and clarifying roles (Rovio, Arvinen-Barrow, Weigand, Eskola, & Lintunen, 2010), which seems logical given that 'roles' represented the most common theme addressed in frameworks of team processes in sport (Collins & Durand-Bush, 2015a). While 'goals' was interestingly one of the least frequent themes found in frameworks (Collins & Durand-Bush, 2015a), the topic of goal setting is among the most widely researched in the team building literature (Martin, Carron, & Burke, 2009). In the present research, setting goals and establishing roles were key processes that contributed to forming the structure of teams, along with selecting members, creating norms, and clarifying expectations. As previously mentioned, these structural team processes were differentiated from individual and

team regulation processes in the OTF model as they represent actions that should be addressed in the beginning phases of team formation and periodically revisited throughout a season given that they steer individual and team regulation processes (Collins & Durand-Bush, 2015c).

Team building intervention studies have also targeted team processes such as interaction (e.g., Newin et al., 2008), support (e.g., Stevens & Bloom, 2003), problem solving (e.g., Dunn & Holt, 2003; Holt, Knight, & Zukiwski, 2012), and leadership (e.g., Bloom & Stevens, 2002; Stevens & Bloom, 2003). Yet, only a few of these processes were addressed in each intervention and they were not linked to theoretical frameworks. In the current research, these processes were categorized as team regulation processes reflecting actions that contribute to the *day-to-day* functioning and activities of teams in varying contexts. This temporal aspect of team regulation processes distinguishes it from structural team processes, the latter of which are addressed on a periodical rather than daily basis. Additional team regulation processes highlighted in the present research involving both coaches and athletes include *cooperate* and *make decisions*. Overall, these team regulation processes have not been particularly addressed in previous frameworks nor the cohesion and team dynamics literature.

Individual attributes such as complacency, an inability to handle nerves, and a lack of composure and concentration have been found to hinder team performance (Collins & Durand-Bush, 2010; Pain et al., 2012). Still, processes required to manage such individual attributes (e.g., individual regulation processes) have received virtually no attention in existing frameworks (Collins & Durand-Bush, 2015a). Interestingly, while McEwan and Beauchamp (2014) included several regulation processes (e.g., preparation, execution, evaluation) in their recent model of teamwork and team effectiveness, the latter were predominantly described as *team* processes implemented to regulate team performance. Presently, only a few team building intervention

studies have directly targeted individual processes. For instance, Dunn and Holt (2003) addressed individual accountability by having team members write and share their pledge to the team. Bloom and Stevens (2002) helped individual athletes respond to being selected or not to compete. Finally, Collins and Durand-Bush (2010) guided athletes to individually self-regulate (e.g., prepare to feel the way they wanted) to improve team performance and cohesion. Findings of the current research are novel in that they are amongst the first to show the importance of individual regulation processes for optimal team functioning. When considered in relation to Zimmerman's (2000) social-cognitive model of self-regulation, which comprises preparation, execution, and evaluation phases, it becomes apparent that coaches and athletes reported using a number of strategies to prepare for (e.g., visualize), control (e.g., fake it), and evaluate (e.g., journal) their performances. Given this, and the fact that self-regulation skills were found to be essential for team functioning in previous curling research (Collins & Durand-Bush, 2010, 2014; Tamminen & Crocker, 2013), the present research addresses a crucial gap in the way we view team functioning. Indeed, it is easy to see how on small teams like those involved in curling, a loss of individual regulation processes reflected in a player's inability to remain aware and exert self-control, can impact the way team members perform (i.e., think, feel, and act). It was shown that individual regulation processes are important on larger teams as well (Callary & Durand-Bush, 2008). For instance, by learning to regulate the way they individually felt and interacted, members of a varsity volleyball team reported that they were better able to manage themselves as a group and enhance their performance (Callary & Durand-Bush, 2008).

Overall, these findings highlight the importance of helping team members to both individually and collectively regulate themselves in the process of achieving optimal functioning. Both coaches and teammates play a key role in facilitating self-regulation (Collins & Durand-

Bush, 2010, 2014; Durand-Bush, McNeill, & Collins, 2015; Hadwin, Jarvelä, & Miller, 2011) and knowledge of all team members is essential (Beauchamp, Jackson, & Lavallee, 2007; Collins & Durand-Bush, 2010). Teams should thus explicitly discuss what they need to effectively self-manage and specify how others can support their self-regulation in different situations and contexts. For instance, in the present study, coaches contributed to this by providing performance reminders and encouraging athletes to ask for what they need, do self-assessments, and accept feedback (Collins & Durand-Bush, 2015c).

Finally, the present research highlighted the unique roles that high performance curling coaches play in developing optimally functioning teams. In performing their role as technical/tactical specialists, mediators, facilitators, managers, and motivators, coaches helped teams to nurture structural team processes (e.g., kept track of individual and team goals, manager role), individual regulation processes (e.g., praised athletes for taking personal responsibility for mistakes, motivator role), and team regulation processes (i.e., mediated interpersonal conflict, mediator role). Coaches also helped athletes to enhance individual (e.g., corrected athletes' technique during practice, technical/tactical specialist role) and team attributes (e.g., discussed ways to improve team tactics, facilitator role). Additionally, they monitored the context (e.g., scouted rocks, manager role) as well as desired outcomes (e.g., facilitated a discussion regarding team dynamics due to poor team functioning, facilitator role). Some of these roles are in line with findings showing that expert coaches manage the technical, tactical, physical, mental, and organizational aspects of their sport (Côté, Yardley, Hay, Sedgwick, & Baker, 1999; Thelwell, Weston, Greenlees, & Hutchings, 2008). While considerable research has focused on the technical and tactical elements of coaching (Lyle, 2002), less attention has been paid to the other roles that coaches were found to play in high performance curling.

The OTF model: A checklist to address components. In the aforementioned sections, several unique features of this research were discussed, which provide valuable insight into optimal team functioning. That said, in order to effectively distribute the knowledge gained from this research and ensure its availability for future users, the results are simplified into clear systematic guidelines that can be used to steer coaches, athletes, and practitioners in their work with teams. The following section will outline the Optimal Team Functioning (OTF) Checklist (see Figure 1), developed based on the results of this research and the existing literature. This initiative addresses Collins and Durand-Bush's (2015a) request for scholars to "invest more effort into providing concrete guidelines to not only help practitioners build effective teams in their practice, but also guide researchers attempting to use frameworks in intervention studies and report applicable findings" (p. 13).

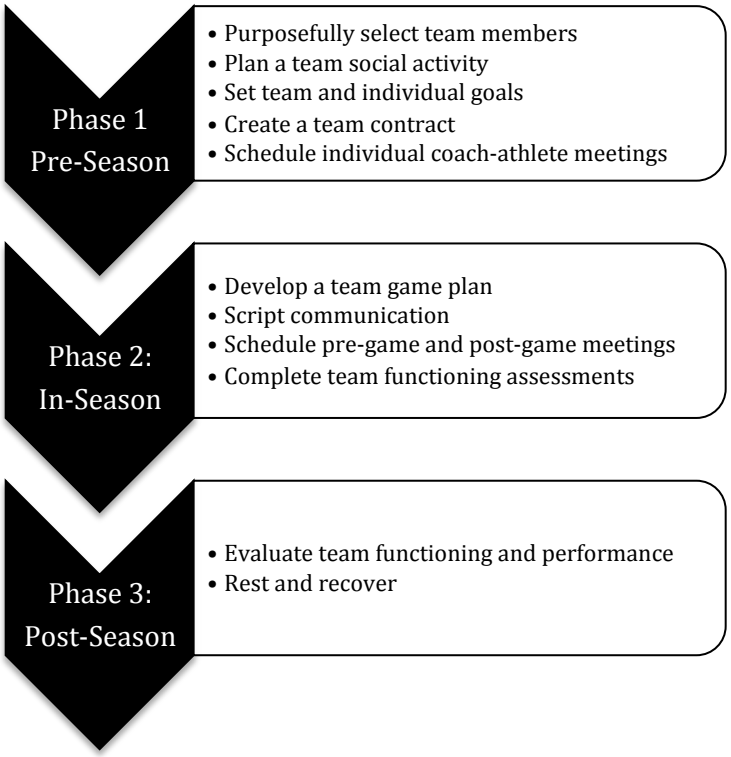

Figure 1: The OTF Checklist

The OTF Checklist is divided into three phases: (a) pre-season, which focuses on the preparation of teams for the upcoming season (i.e., preparatory phase of periodization, Holliday et al., 2008), (b) in-season, which involves practicing and performing as a team (i.e., competitive and peak phases of periodization, Holliday et al., 2008), and (c) post-season, which allows teams to reflect on and recover from the season (i.e., recovery phase of periodization, Holliday et al., 2008). This three-phase approach is consistent with research suggesting that mental training should be periodized to ensure that key concepts are introduced and revisited at appropriate times in a competitive season, and also to reduce the likelihood of training overload (Holliday et al., 2008; Lidor et al., 2007). To date, no known studies have proposed an evidence-based phasic or periodized approach to develop and sustain team functioning in sport.

Within each phase of the OTF Checklist, self-regulation theory provides an additional strong foundation for implementing team and individual processes and strategies. Specifically, consistent with the social-cognitive model of self-regulation (Collins & Durand-Bush, 2010; Zimmerman, 2000), an emphasis is placed on (a) preparing teams to achieve optimal team functioning, (b) executing or performing as a team, and (c) reflecting on team functioning. Incorporating these elements is appropriate for two reasons. First, highlighted in the OTF model is the importance of individual regulation processes - remain aware, prepare, exert self-control, take responsibility, and adapt (Collins & Durand-Bush, 2015c), which have been addressed in the self-regulation literature (Durand-Bush et al., 2015; Zimmerman, 2000). Secondly, studies have shown that teams in which members *prepared* (e.g., anticipated responses to challenges), used individual and collective strategies to *perform*, and *reflected* on/debriefed games, reported enhanced cohesion and performance (Callary & Durand-Bush, 2008; Collins & Durand-Bush, 2010, 2014).

An important consideration when implementing the OTF Checklist pertains to the roles of coaches and athletes in the process. Given that Collins and Durand-Bush (2015d) found that coaches play a large role in developing and maintaining optimal team functioning in high performance curling, and are often viewed as mediators, facilitators, managers, and motivators, coaches are in a great position to oversee the use of the OTF Checklist. This is consistent with research suggesting that coaches are responsible for directing all aspects of the coaching process, not merely technical/tactical aspects (Lyle, 2002). Moreover, with training or guidance, coaches can develop the skills necessary to deliver interventions and thus have a profound positive impact on the functioning and performance of their athletes.

While coaches can be tasked to manage the OTF Checklist, athletes must be active participants in the process. This is crucial as ultimately, team members must be able to manage themselves without the help of their coaches. Results of this research showed that athletes have an awareness of what helps and hinders team functioning, which supports Pain and colleagues' (2012) findings. Moreover, similar to what previous studies demonstrated, athletes reported using strategies to enhance various team regulation processes such as problem solving (Holt et al., 2012) and communication (Collins & Durand-Bush, 2010), as well as individual regulation processes such as self-control (Tamminen & Crocker, 2013). Therefore, athletes should provide valuable insight into how to nurture team processes on their team. Also, when athletes can provide input and are encouraged to take initiative, they experience greater levels of self-determined motivation and persistence (Pelletier, Fortier, Vallerand, & Brière, 2001). Thus, it is argued that by having considerable influence over the processes and strategies included in the OTF Checklist, athletes will be more apt to continue working towards optimal team functioning, particularly when faced with challenges and setbacks.

Within each phase of the OTF Checklist, items and questions for reflection, group discussion topics, and specific team exercises that coaches or athletes can facilitate are provided.

Phase 1: Pre-season. The pre-season phase takes place prior to the start of the competitive season (i.e., summer). The aim of this phase should be threefold: (a) to create opportunities for team members to get to know one another and begin to form or solidify relationships (i.e., bring awareness to individual and team attributes), (b) to set the foundation for the team by providing ample opportunities for team members to learn how to communicate with one another, both for task and social purposes, and (c) to create a strong team structure wherein the team is selected, goals are set, roles are established, norms are created, and expectations are clarified (Collins & Durand-Bush, 2015b, 2015c). Considerable time should be devoted to this phase as by doing this groundwork during the pre-season phase, many issues and obstacles will likely be avoided. As suggested by Anderson (2000), "coaches and players are more generous with their time during this preseason phase and thus are more likely to engage in the goal-setting process" (p. 101), and arguably other processes as well.

Purposefully select team members. Teams almost unanimously spoke about the importance of considering compatibility when selecting team members. Compatibility was discussed in relation to personal characteristics such as personality, lifestyle, priorities, technical skills and tendencies, and preferences for group interactions (Collins & Durand-Bush, 2015b, 2015c). Thus, selecting new teammates was not simply about selecting the athletes with the best sport-specific skills. In order to select teammates that will best 'fit' within a team, it is advised that team members undertake three steps in the pre-season phase: (a) Talk to potential new members' existing and previous teammates and coaches – what is it like to coach and/or compete with these individuals? (b) Observe potential new members in their performance environment

(e.g., via recordings of televised competitions) – how do they communicate and interact with teammates? What are their technical tendencies? Can they remain composed when frustrated or under pressure? (c) Conduct a formal or informal interview with potential new members to learn more about their personal qualities and motivations (i.e., personal characteristics), skills (i.e., individual sport competencies and characteristics), communication tendencies (i.e., communicate), and other team processes in which they would be expected to engage such as how well they can control themselves (i.e., self-control) and work with others (i.e., cooperate). Collecting key information will allow team members to make an informed decision during the selection process. The aim is not to find a 'perfect' candidate but rather someone with whom coaches and athletes can confidently work, and someone who will help them achieve their goals and desired outcomes.

Plan a team social activity. The development of intra-team trust and respect are essential for effective communication and success (Collins & Durand-Bush, 2010, 2015c; Yukelson, 1997). Pain and colleagues (2012) found that opportunities to connect socially with teammates helped with the development of cohesion. Once the team has been formed, teams should spend some time together in the pre-season phase to get to know one another and establish sound and trusting relationships. To this end, team members should brainstorm possible social activities in which all members, including the coach, can participate. For example, renting a cottage to get away from the hustle and bustle of daily life makes for great team bonding. Other examples shared in the present research included going for dinner or drinks, playing golf, and participating in circuit training together (Collins & Durand-Bush, 2015b).

Set team and individual goals. A key process stemming from both the present research (Collins & Durand-Bush, 2015b, 2015c) and the existing literature (Senécal et al., 2008;

Widmeyer & Ducharme, 1997; Yukelson, 1997) pertains to goals. Setting goals should therefore be prioritized once team members have had a chance to get to know one other a bit better. Since setting goals it is a structural team process (Collins & Durand-Bush, 2015c), it should occur in the pre-season phase. To accomplish this, team members should plan a lengthy meeting to determine what they want to collectively and individually achieve in the upcoming season. They should take the time in this exercise to assess individual and team attributes (i.e., strengths and weaknesses) by openly discussing them or using validated questionnaires, as attributes inform what goals to set. Team members should also identify potential barriers to goal achievement such as communication breakdowns or low commitment to training and effective responses to them should be planned (Collins & Durand-Bush, 2010). Coaches can play a key role in facilitating goal achievement and accountability by monitoring and evaluating goal progress. This, in turn, will help increase or maintain effort and reduce social loafing (Eccles & Tenenbaum, 2007; Steiner, 1972).

Create a team contract. Team contracts were one of the most commonly used strategies to enhance team functioning in the present research. Contracts were used to increase commitment (i.e., personal characteristics), state acceptable behaviour/standards (i.e., create norms), and hold team members accountable for their actions and performances (i.e., take responsibility; Collins & Durand-Bush, 2015b). In an effort to create guidelines for team functioning, the team contract should address several processes (e.g., include set goals) and attributes (e.g., stipulate required commitment for training and competitions). In this exercise, teams should discuss to create norms and clarify expectations regarding attitude, effort, communication, support, decision-making, problem solving, and leadership, to name of few. By

putting in place team ground rules and consequences, and by clarifying individual expectations, teams will know how to respond if issues or conflict arise (Collins & Durand-Bush, 2010).

Schedule individual coach-athlete meetings. Toward the end of the pre-season phase, it is advisable that coaches schedule one-on-one meetings with each team member for three reasons. First, these meetings will give coaches and athletes the opportunity to get to know one another on a more personal level (e.g., share additional personal characteristics in private, further establish trusting relationships). This is essential as coaches and athletes who have honest relationships characterized by trust and caring, are better able to communicate and share thoughts and concerns, and experience greater satisfaction and cohesion (Jowett, 2005; Jowett & Chaundy, 2004; Jowett & Cockerill, 2002). Secondly, these meetings will provide coaches with a chance to discuss with athletes their set goals and desired outcomes and how they can best support their achievement of these in the upcoming season. Thirdly, one-on-one coach-athlete meetings will enable coaches to discuss, in confidence, any aspect of the team contract and clarify with athletes their roles (Eys, Burke, Carron, & Dennis, 2010) for the upcoming season.

Phase 2: In-season. The purpose of the in-season phase, which spans a team's competitive season, should be twofold: (a) to develop and sustain both individual (e.g., prepare, adapt) and team (e.g., interact, lead) regulation processes, and (b) to continue nurturing individual and team attributes, communication, and structural team processes (Collins & Durand-Bush, 2015b, 2015c).

Develop a game plan. In team building research, very few studies have addressed how teams make day-to-day or game-by-game decisions. For the most part, scholars have instead focused their attention on how teams solve larger problems (McEwan & Beauchamp, 2014) or conflict (Holt et al., 2012). However, planning how to operate in different performance situations

contributes to shared knowledge (Bourbousson, Poizat, Saury, & Seve, 2011; Eccles & Tenenbaum, 2004; Eccles & Tran, 2012). Thus, by creating a game plan in this exercise, team members will be able to anticipate actions and decisions, allowing them to maintain effective functioning during games. Based on the results of this research, examples of processes and attributes that should be considered and discussed when developing the game plan are: (a) roles of each team member (e.g., who will clean the path) established during the pre-season, (b) athletes' attributes (e.g., shot-making ability of each player and the team) assessed during the pre-season, (c) how team members will cooperate (e.g., positioning of sweepers), support each other (e.g., help teammates refocus), make decisions (e.g., provide input), and lead (e.g., give feedback), and (d) the context (e.g., address changes in ice conditions). The effectiveness of the game plan should be continually assessed and adapted as necessary.

Script communication. Given the foundational process of communication in the OTF, teams should address communication early in the in-season phase. One relevant exercise involves identifying *what* team members will need to communicate in game situations (e.g., regarding strategy, line of delivery of rocks), *when* the information will be communicated (e.g., before shots, between ends), *how* the information will be shared (e.g., tone of voice), and by *whom* (e.g., skip, designated communication leader). This information can then be integrated into a script that coaches and athletes can review when preparing for games. Coaches and athletes in the present research shared the importance of openly talking about needs and preferences for communication, which supports the importance of tailoring communication scripts to specific individuals and situations (Beauchamp et al., 2007; Beauchamp et al., 2005; Collins & Durand-Bush, 2010, 2015b, 2015c; Yukelson, 1997). To elicit information from coaches and athletes, the following questions can be asked: What do you want to hear (or not hear) when you are

performing well and performing poorly (e.g., after making mistakes)? How do you yourself typically communicate when the team is winning versus losing? What would be ideal?

Eccles and Tenenbaum (2004) reported that in performance situations, team members only have limited opportunities to communicate with one another, thus effective communication is largely dependent on pre-process planning. This exercise can therefore allow team members to be clear and concise while communicating during games, remain aware of changes in the environment (e.g., deteriorating ice conditions), and stay connected regardless if they are winning or losing. They may also be able to keep communication more task-focused, which has been linked to successful teams (Lausic, Tennenbaum, Eccles, Jeong, & Johnson, 2009). The effectiveness of such communication scripts could be evaluated by recording on-ice communication during select games, and addressing it during team debriefs.

Schedule pre-game and post-game meetings. Pre-game and post-game meetings were found to be key aspects of effective team functioning (Collins & Durand-Bush, 2010) and this was corroborated in the current research and is congruent with self-regulation processes (i.e., preparation and self-reflection, Zimmerman, 2000). In order to allow team members to effectively prepare before games and evaluate their performances after games, pre- and post-game meetings should be scheduled and structured. It is recommended that coaches first facilitate a discussion with team members regarding what they need to adequately prepare individually and collectively before games (e.g., alone time to listen to music, dynamic warm-up) and ensure their routine allows them to meet their needs. To identify the content of the pre-game meeting, which is one aspect of their preparation, it is recommended that teams consider establishing a structure allowing them to: (a) establish and/or revisit team and individual goals (b) discuss the context and opponents, (c) revisit the game plan and determine if and how it

should be adapted based on the context and opponents, and (d) discuss quick reminders as necessary (e.g., roles, expectations, communication). Pain and Harwood (2007) stated that one of the most important aspects of pre-game routines may not be the content of the routines themselves, but the familiarity and consistency of them for athletes' physical and mental preparation. Consequently, teams' pre-game preparation, including the pre-game meeting, should be as consistent as possible, yet allow for adaptation as this is an important aspect of self-regulation and was identified as an important individual regulation process in the present research.

Similarly, teams' routines after games should be discussed, planned, and implemented as consistently as possible, regardless of the outcome (Durand-Bush & Salmela, 2002). Coaches can help determine the structure of post-game meetings by discussing it with the team before it is established. For example, what do team members want to hear from the coach and other teammates after a win and after a loss? How will members keep their emotions in check during discussions? What team processes and attributes should be revisited? Based on the results of this research, a four-step debriefing process is recommended during post-game meetings: (a) each team member shares a strength of another member he/she noticed during the game so that each member receives praise and support. This serves to set a positive climate and puts everyone in a good frame of mind to share during the meeting; (b) the coach asks questions to get team members to communicate and debrief aspects of the game (e.g., "Skip, in the 4th end when you called this shot, what led you to make this decision? Was this the best choice or was there a better alternative?" By asking questions instead of giving answers, coaches can facilitate reflection and contribute to enhanced learning and development (Cassidy, Jones, & Potrac, 2009); (c) the coach shares observations that were not addressed in the previous step in order to

create awareness and maximize learning opportunities (e.g., “It looked like there was some tension out on the ice after this end, was this the case and did if affect your shots in the next end?” By sharing observations, more discussion entails and issues can be resolved as necessary; and (d) identify how lessons from the debrief can be integrated into the next game or practice. For instance, what should team members continue to do and what should they change (e.g., goals, game plan, roles, desired outcomes)? This allows team members to adapt and sustain optimal functioning.

Complete team functioning assessments. Various forms of assessment have been used to promote reflection and to tailor interventions in sport (e.g., Pain et al., 2012; Rogerson & Hrycaiko, 2002). Some teams in this research used assessing tools as a strategy to optimize team functioning. According to Pain and colleagues (2012), when teams continually evaluate strengths and weaknesses, it is much easier for the coach to address them. This exercise in which team functioning (i.e., various processes and attributes) is periodically (e.g., every two months) assessed is vital for gaging and responding to peaks and valleys during a lengthy competitive season. Assessments can be done via paper and pencil questionnaires (e.g., the Performance Environment Survey, Pain & Harwood, 2008; the Group Environment Questionnaire, Carron Widmeyer, & Brawley, 1985), formal or informal interviews with the coach, as well as observations during games and practices. Results of these assessments provide team members with an opportunity to: (a) reflect on themselves and their team (i.e., remain aware); (b) discuss important data regarding team functioning and improve as necessary (i.e., take responsibility and adapt); and (c) reinforce effective processes already in place, as well as individual and team attributes that help sustain optimal team functioning.

Phase 3: Post-season. Following the end of the competitive season, teams should reflect on it and draw lessons for the future (e.g., overall team functioning, achievement of set goals and desired outcomes). They should also schedule some time for rest and recovery.

Evaluate team functioning and performance. This exercise involves evaluating and comparing team and individual performances and achievements in relation to teams' set goals and desired outcomes, and reflecting on gains and losses (e.g., discrepancies) to improve in the future. This type of reflection distinguishes elite athletes from less elite ones (Jonker, Elferink-Gemser, & Visscher, 2010; Toering, Elferink-Gemser, Jordet, & Visscher, 2009) and is a key component of self-regulation and learning (Zimmerman, 2000). Thus, in the present exercise, coaches and athletes should reflect on all components of the OTF model, rate them, and identify both strengths on which to build and areas to improve. To this end, they could complete the assessments recommended during the in-season phase one last time and/or have a lengthy discussion of team functioning and performance in relation to key aspects of the season. For instance, questions that could be asked include: What are our team and individual strengths and weaknesses? What should we continue doing and stop doing? What new things can we try doing or learn to take us to the next level?

Being able to adapt and learn from reflection is dependent upon being highly aware, open, and honest. Thus team members should be curious and explore their perceptions and experiences. If coaches and athletes do not agree with others' perceptions, they should respectfully discuss them by using appropriate communication strategies (e.g., by sharing observations, focusing on what is most important, saying things the right way, paying attention to non-verbal cues). While encouraging team members to make effective self-judgments, coaches can also ensure that they take responsibility for their actions and contributions (or lack thereof)

to team functioning and performance. Members should feel motivated to learn from their experiences, as adaptive self-reactions are associated with greater persistence and effort in the future (e.g., experiment with new self-control strategies; Zimmerman, 2000).

Rest and recovery. As noted by Johnson and Tenenbaum (2006), periods of rest and recovery are essential in high performance sport because of the "highly taxing nature of deliberate practice in both physical and psychological dimensions" (p. 34). Indeed, at the elite level, curling teams spend an enormous amount of time travelling to and competing in multiple events, training, and performing other curling related tasks. Thus, as stipulated by Ericsson and colleagues (1993), recovery is essential: "Under the assumption that practice draws on limited physical and mental resources, one would expect that the level of practice an individual can sustain for long periods of time is limited by the individual's ability to recover" (Ericsson, Krampe, & Tesch-Römer, 1993, p. 371). Given that coaches were often responsible for planning practices and organizing schedules in this research, they are in an ideal position to emphasize the importance of taking time away from the rink and from one another during this phase. This way, team members can spend more time with family and friends, an important strategy highlighted in Article 3.

In sum, the OTF Checklist provides a structure as well as items and questions for reflection, group discussion topics, and exercises to periodize team work with coaches and athletes. It is not an exhaustive checklist, as can be seen when comparing it with the strategies presented in Article 3. Instead, efforts were made to simplify and condense the recommended strategies as much as possible to increase the feasibility of use, and provide a structure and timeline for implementing them based on the hierarchy of components in the OTF model and recommendations for periodizing interventions. As Senécal and colleagues (2008) stated,

"coaches acting as [an] intervention facilitator may not have the patience, time, commitment, and know-how to successfully facilitate a team-building intervention" (p. 187; Brawley & Paskevich, 1997). By creating the OTF Checklist, efforts were made to reduce the time demands placed on coaches when working to optimize team functioning and provide them with practical guidelines to expand their practice in this area. That said, it would be beneficial for coaches to undergo specific training to effectively and efficiently facilitate this process involving extensive components and steps (see subsequent section on applied contributions).

Contributions of the Research

Theoretical and Methodological Contributions

This research has significant theoretical implications. As highlighted in Article 1, existing frameworks of team processes in sport can be criticized for a number of reasons (Collins & Durand-Bush, 2015a), including their lack of comprehensiveness, their lack of practical implications and guidelines to guide team building intervention research and practice, the exclusive top-down or deductive approach from which they were developed, and their predominant focus on the outcome of cohesion. Scholars have noted that this emphasis on cohesion has limited our understanding of how to build effective teams (Bruner, Eys, Beauchamp, & Côté, 2013) and that cohesion does not always lead to successful performance (McEwan & Beauchamp, 2014), thus other processes and outcomes must be considered.

The OTF model developed in the present study addresses the theoretical limitations of previous frameworks of team processes in sport. As indicated in Article 2 (Collins & Durand-Bush, 2015c), it is a comprehensive framework addressing multiple processes and attributes, which far exceeds those addressed in existing frameworks. The model was also the first one to be developed using a bottom-up or inductive approach using constructivist grounded theory

(Charmaz, 2006). By examining the real life experiences of coaches and athletes working together as teams in the context of curling, numerous team processes that were not explicitly or extensively addressed in existing frameworks were uncovered. Furthermore, based on the guidelines of constructivist grounded theory (Charmaz, 2006), the OTF model targets actions that can be easily integrated into practice to optimize team functioning. With practical implications in mind, strategies used to enable teams to more effectively work together were elicited from coaches and athletes and linked to each component of the OTF model (Collins & Durand-Bush, 2015b). Finally, the OTF model addressed a component of "Desired Outcomes" that extends beyond cohesion. Indeed, teams in this research discussed several outcomes of optimal team functioning (e.g., optimal performance, well-being) that reciprocally impacted all components of the model. It is therefore important to allow teams to identify and monitor different outcomes deemed important to their overall functioning.

The OTF model makes a significant contribution to theory. It marks the first comprehensive, sport-specific, applicable, grounded theory framework of team functioning in sport. The model can be used to guide future research on team functioning in curling and potentially other sports. It can also be used to scientifically ground future team building interventions in curling and other future validated contexts. This is essential as scholars have argued that "interventions (e.g., team building) should be developed on the basis of a theoretical understanding or modeling of how things work" (Evans, Eys, Bruner, & Kleinert, 2013, p. 518).

From a methodological standpoint, this research shows how a constructivist grounded theory approach can be implemented to examine team functioning in a particular sport. The thorough description of steps and procedures in the methods chapter reveals how rigorous yet flexible parameters were conducive to meeting the demands of high performance coaches and

athletes during the research process and to adapting to challenges in the context (e.g., scheduling interviews during training camps and competitive events over a two-year period). The inductive nature of the methodology was paramount in addressing key gaps in the literature and developing a comprehensive model and inventory of strategies that coaches and athletes can utilize. Charmaz's (2012) constructivist variant of grounded theory, which has a strong focus on actions, was crucial for meeting the aims of this research. To date, this variant has seldom been used in grounded theory research in sport, thus from this standpoint, the current research makes a unique contribution to methodologies used in sport research.

Applied Contributions

In addition to making significant theoretical and methodological contributions, this research has valuable practical implications for both coaches and athletes.

Coaches. Currently, in order to be certified to coach in high performance curling contexts in Canada, coaches must complete the National Coaching Certification Program (NCCP). This training consists of three parts: participation in a curling "Competition Coach" workshop, completion of the "Make Ethical Decisions" evaluation (online), and the completion of a "Competition Coach" curling evaluation (in-person or via video). The topics currently addressed in the certification program relate to teaching and learning strategies, strategy and tactics, delivery and brushing skills, skill analysis, practice planning, and drills to correct (CC, 2015). None of the 'softer' and more interpersonal skills required to develop optimal team functioning are targeted. As indicated in Article 4, aside from the skills required to fulfill the role of technical/tactical specialist, those required to perform the roles of mediator, facilitator, manager, and motivator are not addressed in the NCCP program. This highlights a huge gap that needs to be addressed.

Results showed that not all coaches were comfortable or competent to fulfill each role to optimize team functioning. Thus training must be incorporated into coach education programs or their ongoing professional development. In order to give high performance curling coaches every opportunity to be successful in their career, they must be provided with opportunities to learn the skills required to fulfill different roles and efficiently use strategies to guide team functioning. Given the intentional action-oriented focus of the OTF model and associated strategies to nurture all team processes and attributes included in the model, it has significant practical implications to train coaches. This was demonstrated in the OTF Checklist provided in a previous section.

Athletes. The implications for athletes are equally as valuable. While Articles 2, 3, and 4 highlighted the important contributions that coaches made and the roles they played in guiding teams to optimal team functioning, results showed that athletes were also significantly involved in this process. Indeed, high performance teams in curling are highly knowledgeable and self-directed and anecdotal evidence shows that they often compete without coaches. This was corroborated in the current research as not all teams had a coach at the time of data collection, and teams who did, shared that their coach did not always accompany them to competitive events and practices. Additional anecdotal evidence shows that even at a high performance level, many teams face budgetary constraints. Furthermore, when in attendance at events, coaches have limited opportunities to interact with their athletes during games. Consequently, it is imperative that athletes know how to function and manage themselves in the absence of their coach. As one athlete stated, “For the weekends, [Coach] is away, like we can’t just fall to pieces. We still have to be able to maintain ourselves”.

This study makes an important applied contribution as results can assist athletes in fostering high quality team functioning. Similar to how coaches can utilize the findings of this

study, athletes can use the OTF model in Article 2 as a map to initiate discussions surrounding the role that each team member plays in the day-to-day operation of the team, as well as situations and contexts that might challenge their ability to effectively function. The strategies presented in Article 3 could provide them with ideas regarding *what they can do* to nurture processes and attributes so that they can successfully get their job done, even in the most difficult of circumstances. Having an open dialogue about these topics is essential as mistakes and feelings of frustration in high-pressure games have been shown to hinder team functioning (Collins & Durand-Bush, 2010). By anticipating and preparing for potential obstacles, high level athletes can develop strategies to more easily navigate some of the hurdles that challenge their functioning and performance (Collins & Durand-Bush, 2010; Durand-Bush & Salmela, 2002). For instance, an issue shared in this study related to communication breakdowns when teams performed poorly. By anticipating this obstacle, and more importantly preventing it, team members could put in place pre-emptive strategies to maintain communication in difficult situations by scripting desired communication between ends or by tasking someone to initiate communication in such instances (see strategies in Article 3 and OTF Checklist in previous section).

Similar to coaches, it is imperative that high performance curling athletes be provided with additional resources to help them develop and implement appropriate team processes and strategies. For example, workshops could be provided at national training camps and mentoring could be provided as necessary throughout a season to help athletes address and nurture team functioning, particularly in the absence of their coach. Additionally, similar to the indirect approach used to facilitate team building (Carron & Spink, 1993), training in this area could also

be accomplished by educating coaches on how to teach athletes key team functioning skills and strategies.

Limitations

Generalizability

In line with Collins and Durand-Bush's (2015a) call for grounded theory research to develop comprehensive models of team functioning in sport, the OTF model was developed in the current study. While this model has clear benefits, it, along with the overall research, presents limitations. Specifically, grounded theory studies are sometimes criticized for their limited generalizability (Charmaz, 2006). Given the sport-specific (i.e., curling) and context-specific (i.e., high performance level) results generated in this research, the findings are not necessarily applicable to other sports (e.g., hockey, football) and contexts (e.g., developmental level). It seems probable that the components addressed in the OTF model may be relevant to other sports, however, the strategies used to optimize each component and the role of coaches in this process, would perhaps differ. For example, coaches working with larger teams in which there are 50 athletes (e.g., football) would likely have to take a more directive approach and delegate more tasks in order to manage teams. More time, effort, and strategies could be required to develop team processes and attributes and monitor the context and desired outcomes. Consequently, in order to extend the value of the OTF to other sports and contexts, efforts must be made to validate it with other sport populations.

Focus Group Interviews

An additional limitation of the present research relates to the methods employed during data collection, that is, focus group interviews and telephone interviews. For instance, focus group interviews have received criticism because they can be dominated by one or two people

(Smithson, 2000), which can lead some participants to not share their thoughts. In an effort to reduce the likelihood of this happening during the focus group interviews, efforts were made to encourage participation from all team members by directing questions towards each individual. However, it is still possible that not all pertinent experiences were shared as a result of the group context.

Additionally, given the focus group format utilized, confidentiality amongst athletes could not be guaranteed (Gibbs, 1997). Thus, the athletes' level of openness to share experiences was likely influenced by trust between teammates. For example, it is possible that some athletes may have been less likely to discuss issues pertaining to their coach for fear that their comments would be shared with him following the interview. While it seems likely that the highly functioning teams trusted that what they shared in the focus group interviews would remain confidential between team members, this may not have been the case for some of the newly formed or the less functioning teams. Efforts were made to manage this possible limitation by iterating the importance of keeping the content shared confidential and by providing participants with an opportunity to share their level of agreement and add any further comments, in confidence, in the exit questionnaire they completed after the focus group interview. Overall, the reported level of agreement was very high, which suggests that teams were comfortable and "on the same page". Furthermore, a common comment pertained to "how good it was for us to talk about these topics in the interview".

Telephone Interviews

For feasibility purposes, individual coach interviews were conducted over the telephone, rather than face-to-face. This method was valuable because telephone interviews could be scheduled at a time that was convenient for coaches, away from distractions at training camps

and competition venues. Novick (2008) argued that participants are more likely to feel relaxed and disclose personal information over the telephone, yet others note that telephone interviews have limitations. For instance, the absence of face-to-face contact prohibits the researcher from observing non-verbal cues. This limits the transmission of information by gestures, facial expressions, and body language, and may make it difficult to establish rapport between the researcher and participant (Novick, 2008). However, the researcher relied more heavily on the coaches' tone of voice, speech cadence, and moments of silence as cues to facilitate discussion during the telephone interviews. The openness of coaches to share both good and bad experiences, which was in part supported by the length of the interviews (i.e., average of 85 minutes), leads the researcher to believe that great rapport was established and honest information was shared.

Interviewing Coaches and Athletes Separately

Finally, one aspect of the research design that could be viewed as a potential limitation was that coaches were not included in the team focus group interviews. Coach behaviour and coach-athlete relationships can both positively and negatively impact team functioning (Bloom et al., 2003; Jowett, 2007; Turman, 2003), thus coaches were excluded from the focus group interviews in order to create an environment wherein team members felt comfortable discussing how their coach helped and hindered team functioning without fear of repercussions. This was considered essential because, as Krueger and Casey (2009) suggested, in order for focus groups to be successful, the setting must be conducive to open and honest answers. That said, because coaches were excluded from the focus group interviews, it was sometimes difficult to ascertain congruency between athletes' and coaches' perceptions. For instance, it is possible that a role prioritized by the coach may have been deemed less valuable by the athletes. However, given

that several coaches and athletes discussed the role, it was included in the results. Further research engaging coaches and athletes together is needed to fully understand how team functioning fluctuates throughout a season and can be managed by both parties. This would help uncover the best possible way to deliver interventions and implement various strategies.

Recommendations for Future Research

Test the Applicability of the OTF Model to other Sports and Contexts

As previously noted, the results of this research led to the development of a sport-specific model of optimal team functioning and corresponding strategies. While this is advantageous in that no other sport-specific model exists in the literature, it limits the generalizability of findings to other sports and contexts. Consequently, further research is needed to determine the applicability of the OTF model. First, priority should be on examining the applicability of the OTF model to other curling contexts, from grassroots upwards. This is particularly important as coaches indicated that their roles changed based on the age, maturity, and level of their athletes (Article 4). It would also be interesting to conduct a comparative study involving coaches and athletes from large (e.g., football), moderate (e.g., volleyball), and small sport teams (e.g., tennis - doubles), and/or sports with high (e.g., soccer, hockey) and low (e.g., rowing - double scull) degrees of task interdependence, to explore the relevance of the OTF model to different sports and contexts. Alternatively, investigating the perceived applicability of the OTF model by mental performance consultants working with a variety of sport teams 'in the field' would also provide interesting insight into the real world application of the model.

Create a Measure of Team Functioning

In order to further advance our understanding of the day-to-day functioning of sport teams, it is imperative that further research also be devoted to the development of a valid,

reliable, and comprehensive measure of team functioning. To date, measures have focused on select outcomes such as cohesion (Group Environment Questionnaire, Carron, Widmeyer, & Brawley, 1985; Youth Sport Environment Questionnaire, Eys, Loughead, Bray, & Carron, 2009), collective efficacy (Collective Efficacy Questionnaire for Sports, Short, Sullivan, & Feltz, 2005), and specific and isolated team processes such as communication (e.g., Scale of Effective Communication in Team Sports-2; Sullivan & Short, 2011), leadership (Leadership Scale for Sports, Chelladurai & Saleh, 1980), and roles (Role Ambiguity Scale; Beauchamp, Bray, Eys, Carron, 2002). Another assessment measure, the Performance Environment Survey (Pain & Harwood, 2008), contains a few items relating to certain components of the OTF (e.g., preparation, roles) and focuses predominantly on the performance (i.e., competition) context and thus does not account for team' overall daily functioning. Moreover, the psychometric properties of this questionnaire have not been determined (Pain & Harwood, 2008; Pain et al., 2012).

Results of this research suggest that it is insufficient to consider team processes and attributes in isolation, as optimal team functioning in curling is dependent on all of those highlighted in the OTF model and are highly interrelated. Sullivan and Short (2011) reported that sound theory should drive the development of measurement tools. Similarly, DeVellis (2012) emphasized that a thorough understanding of a topic of interest is one of the most important considerations when developing measurement instruments. Thus, given the rigorous comprehensive nature of the OTF model, it would be advantageous to develop a measure assessing all eight components of the OTF model and their corresponding processes and attributes. Such an instrument would facilitate a deeper understanding of optimal team functioning, for example, by allowing researchers to differentiate between high and low

functioning teams, and also assist in measuring the impact of research and practical interventions tailored to the specific needs of teams at specific times in their development.

Investigate Sport-Specific Team Functioning Interventions

Finally, in order to facilitate and test the impact of knowledge transfer, it is essential that further research be devoted to developing and evaluating the effectiveness of team functioning interventions in high performance curling. As noted by Collins and Durand-Bush (2015a), many existing team building interventions have not been clearly guided by empirical frameworks or there have been discrepancies between guiding frameworks and processes and strategies included in interventions. As noted by Evans and colleagues (2013), this is a limitation: "interventions (e.g., team building) should be developed on the basis of a theoretical understanding or modeling of how things work" (p. 518). By grounding research interventions in the OTF model (Collins & Durand-Bush, 2015b, 2015c, 2015d), researchers will be able to clearly justify and explain the interventions they develop and also empirically evaluate their effectiveness in creating high functioning teams.

PART V

Conclusion

Creating high functioning teams is a challenging and effortful endeavour (Bloom et al., 2003; Collins & Durand-Bush, 2010; Yukelson, 1997). Indeed, team effectiveness is contingent upon optimizing numerous attributes and team processes, such as communication and interaction, which is arguably difficult because "every athlete has an individual personality, that demands an individual approach, communication skills and specific interventions" (Trninić, Papić, & Trninić, 2009, p. 101). This research contributed new knowledge to better understand what constitutes optimal team functioning in the sport of curling. Furthermore, novel recommendations for practice were provided to help coaches and athletes build effective teams.

In summary, the first aim of this research was to critically review theoretical/conceptual frameworks in the literature directly or indirectly addressing team processes in sport and to derive implications for professional practice. The second aim was to use a grounded theory research approach to investigate factors and strategies contributing to the development and maintenance of optimal team functioning within high performance curling, as well as specific roles that curling coaches play in this process.

Aim 1: The critical review of theoretical/conceptual frameworks directly or indirectly addressing team processes in the literature revealed that seven frameworks have been used to guide research/or practice in sport. These frameworks targeted a variety of team processes regrouped under themes, the most common of which was "roles/norms". On the other hand, one of the least prevalent themes was "goals". While these frameworks addressed different outcomes, the most prevalent one was cohesion. Several limitations were identified, which confirmed the rationale for conducting this doctoral dissertation. Different levels of analyses and comparisons

revealed that the frameworks lacked comprehensiveness (e.g., limited number of team processes, unclear definitions of constructs). Furthermore, practical implications and guidelines to guide team building intervention research and practice were seldom articulated. Many of these frameworks were also atheoretical and all of them were developed using a deductive approach based on findings in the literature. Finally, there appears to be a disconnect between these frameworks and team building interventions studies conducted in sport.

Aim 2: The constructivist grounded theory methodology used to address the second aim of this research led to the development of the OTF Model. This comprehensive model summarizes both team and individual attributes and processes deemed necessary to develop and maintain optimal team functioning in high performance curling. The model comprises six core components (i.e., Individual Attributes, Team Attributes, Foundational Process of Communication, Structural Team Processes, Individual Regulation Processes, Team Regulation Processes) that are reciprocally influenced by two peripheral components (i.e., Context, Desired Outcomes). While the OTF model bares some similarities with existing frameworks, it is unique because (a) it provides a thorough account of interrelated components, attributes, and processes involved in optimal team functioning in curling, (b) components are presented in a hierarchical form whereby communication forms the foundation, and structural team processes guide individual and team regulation processes, (c) it distinguishes between periodic and ongoing processes, (d) it addresses both team and individual attributes and processes in the achievement of optimal team functioning, (e) it is the only inductively derived theoretical model of team functioning in sport, and (f) it focuses on dynamic and interactive processes that can be implemented into practice.

The grounded theory methodology also led to the creation of an inventory of 155 strategies that coaches and athletes used to optimize team functioning in high performance curling. While some strategies resembled those cited in previous team building intervention studies (e.g., set individual and team goals), others were quite novel (e.g., select team members based on compatibility, establish a decision-making process). Coaches applied numerous strategies to help athletes work as a team and achieve their goals, however, so did the athletes, which demonstrates that they play a substantial role in nurturing their own team processes and attributes. Linked to the components of the OTF model, the repertoire of strategies draws attention to evidence-based actions that can serve multiple purposes to build effective teams. It also highlights the importance of individual regulation and communication strategies within teams.

Finally, this research demonstrated that high performance curling coaches can contribute to developing and sustaining optimal functioning teams by playing five key roles. While the roles of technical/tactical specialist, manager, and motivator have been addressed in the literature, the roles of mediator and facilitator have received less attention. Mediating was perceived by coaches and athletes in this research as being valuable to respond to challenges and setbacks, whereas facilitating was useful for enacting several processes such as communication and cooperation. These roles were dependent on athletes' needs as well as both coaches and athletes' personal characteristics and competencies. Indeed, some coaches were reportedly less comfortable and skilled to perform certain roles. Consequently, specific training should be provided to assist coaches in their endeavour to help teams effectively work together.

This research confirms that building effective teams is an ongoing process requiring considerable effort on the part of coaches and athletes. While the development of processes and

attributes is important, effectiveness will arguably be limited without ongoing nurturing and reinforcement. As one coach in the current research highlighted: “There’s never an end to the process. That is, you can have solutions that are fine and then once those routines simply become habits, they have to be thrown away” (C5). Thus, in order to successfully operate over time, teams must continuously “share and evaluate information regarding the quality of team functioning for the purpose of establishing more effective ways of operating” (Yukelson, 1997, p. 93). As underscored in this research, this is contingent upon sound communication.

Despite the clear importance of team functioning for success, few resources are available to guide coaches, athletes, and practitioners in this process. It is hoped that the results of this research will begin to fill this gap by providing curling teams with additional tools and strategies to enhance their functioning and desired outcomes, and generate more applied research in this area. Moreover, while coaches and athletes undoubtedly possess several skills, findings of this research suggest that further training to learn how develop and sustain highly functioning teams would be beneficial. Thus, in order to contribute to the continued success of Canadian high performance curling teams, it would be worthwhile for Curling Canada to prioritize this.

PART VI

Statement of Contributions

While all aspects of this research were conducted by the doctoral candidate, Jamie Collins, the following section will briefly outline the contributions of several others throughout the process. First, the research supervisor, Dr. Natalie Durand-Bush, was involved in all aspects of the research. For instance, she contributed in the initial conceptualization of the research, engaged in regular debriefing sessions with the doctoral candidate throughout data collection and analysis, assisted in development the Optimal Team Functioning (OTF) model, and was a co-author on all manuscripts stemming from this study. The thesis committee members, Dr. Penny Werthner and Dr. Brad Young, were also involved in refining details of the study during the proposal stage.

Dr. Christopher Simon and Ms. Kylie McNeil, who were both members of the research laboratory with the doctoral candidate, also provided assistance. Both served as multiple coders during the data analysis process, and Kylie also provided helpful feedback in the early stages of several manuscripts. Finally, a valuable contribution was provided by the six members of the expert panel. While these members will not be named to protect anonymity, their feedback on the OTF model was extremely helpful.

PART VI

References and Appendices

The next section contains two parts. The first part includes a list of all references used in the thesis that were not referenced in any of the four manuscripts. The second part consists of all appendices referenced throughout the thesis.

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Appendix A

Participant Recruitment Text

CANADIAN CURLING ASSOCIATION
CANADIENNE DE CURLING

TEAM DYNAMICS HAVE A PROFOUND IMPACT ON PERFORMANCE IN CURLING

We, along with the Canadian Curling Association, would like to invite elite coaches and athletes to participate in a study on team dynamics in high performance curling. This study aims to gain valuable information that will help high performance curlers improve their performance. For example, your participation will help us learn about:

- The impact of team functioning on critical decision making and resilience
- How to minimize challenges in the 'heat of battle' or after a tough loss, and
- The importance of communication, including body language.

If you agree to participate as a coach or an athlete, your involvement will first consist of completing a brief demographic questionnaire. Athletes will then participate in a group interview with their teammates and complete a brief exit questionnaire based on their perceptions of the group interview. They will also have the possibility to follow-up on an individual basis. Coaches will partake in an individual interview.

Please share your thoughts and experiences by participating in this worthwhile study. The results will be used by the Canadian Curling Association to positively impact the performance of elite athletes and coaches through hands on training.

We currently do not know enough about team dynamics in curling - help change this!

For more information, please contact

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Appendix B

Athlete Focus Group Interview Guide

Opening Questions:

1. Let's introduce ourselves. Can you please tell me your name, how long you've been competing, both in general and on this team?

Introductory Questions:

2. What was the first thing that came to mind when you were asked to participate in a study on team dynamics in high performance curling?

3. What does 'team functioning' or 'team processes' mean to you?
   How important are team functioning and processes in HP curling?

Transition Questions:

4. Can you describe the nature of team processes within your team?
   (Probe for topics such as verbal and non-verbal communication, day-to-day interactions, goal-setting, decision-making, chemistry, personalities, business versus friendship mindset, discipline, roles and responsibilities, leadership, task execution, social activities, conflict resolution, team proximity, etc.).

5. If you were to observe a video recording of your team on a 'good' day and a 'bad' day, what would you see/hear/think/feel?
   (Probe for verbal elements such as words and tone, and non-verbal behavior such as gestures, body language, feelings and emotions; of both the athletes and the coach).

Key Questions:

6. What contributes to optimal team functioning within your team?
   (*Probes – Is this considered during team formation? Is this discussed at various points in the season? When are you functioning at their best/worst (training versus competition) and why?)*

7. How does team functioning impact your individual and team performance? How about your coach's performance?
   (Probe for examples and concrete outcomes in training and competitions and reasons for positive or negative impact)

8. What role does your coach play in optimizing team functioning on this team? How does he/she help you work and interact effectively with one another? Does he/she sometimes hinder team functioning? Explain how and why.
   (Probe regarding the level of coach involvement in organization, training/practice, and competition; if there are things that hinder team processes, is the coach aware and does he/she do anything about it? What role would you like a coach to play? What would be the impact?)

9. Can you provide some specific examples of strategies that you or your coach use to facilitate team functioning, particularly in response to challenges, setbacks, or obstacles? What is the impact on performance?
   (Probe to determine proactive strategies used when it's going well and reactive strategies executed in response to challenges/obstacles).

10. Who else on the team or affiliated with the team impacts team functioning? Explain how, why, and the outcome on performance. Are these individuals ever in conflict with the coach or other team members? If so, explain how and why.
    (Probe for the level of the individual's involvement in organization, training/practice, and competition; role, strategies used to maintain team effectiveness or make changes in the face of difficulties, how this ultimately impacts performance, etc.).

Ending Question(s):

11. If you had a chance to give advice to other high performance coaches or athletes on how to optimize team functioning, what advice would you give?

12. Is there anything that you would like to add?

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Appendix C

Athlete Consent Form

Title of study: DEVELOPING AND MAINTANING OPTIMAL TEAM FUNCTIONING IN CURLING: EXPLORING THE ROLE OF COACHES AND ATHLETES USING A GROUNDED THEORY APPROACH

Researchers: Jamie Collins, PhD (cand), and Natalie Durand-Bush, PhD, School of Human Kinetics, Faculty of Health Sciences, University of Ottawa.

Invitation: I am invited to participate in a PhD thesis study conducted by Jamie Collins and her thesis supervisor, Natalie Durand-Bush.

Purpose of study: The purpose of this study is to explore the factors involved in developing and maintaining optimal team functioning in high performance curling, with a specific emphasis on the role of the coach in this process.

Participation: My participation in this study will consist of completing a brief demographic questionnaire, which should take between 5 and 10 minutes. I will also partake in a focus group interview with my teammates that will last approximately between 90 to 120 minutes. This interview, conducted by the primary researcher, will be audio-recorded and scheduled at a time and location that is convenient for my teammates, myself, and the researcher. During this focus group interview, I will be asked to share and discuss the factors involved in developing and maintaining optimal team processes in high performance curling, as well as the role of the coach and provide specific examples of strategies that he or she uses to facilitate this process. Additionally, I will be asked to complete an exit questionnaire following the focus group interview, which should take approximately 5 to 10 minutes. Lastly, should follow-up be deemed necessary, I may be contacted for more information that I will be able to provide over the telephone or in an email if this is my preference, recognizing that the anonymity and confidentiality of information exchanged via email cannot be 100% guaranteed.

Risks: There is very minimal risk involved in this study and I am free to withdraw at any time without negative consequence. I may experience discomfort when discussing issues or situations in front of my teammates or in which team functioning is not optimal on the team. Furthermore, I may not feel comfortable voicing opposition to the consensus. However, the information that I choose to share is entirely up to me and the researcher will not encourage me to discuss anything with which I am uncomfortable. I know that I can contact the researcher during the study to address any questions or concerns I may have.

Benefits: There are several potential benefits from participating in this study. The present study will provide me with an opportunity to increase my awareness of team processes on my team. For example, I may become cognizant of things that I can do to promote optimal functioning on my team, or conversely, I may realize that certain behaviours or strategies may be detrimental. As optimal team processes have been associated with enhanced performance and increased member satisfaction, this may provide great benefit

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to my teammates and myself. Additionally, this study will lead to the development of a conceptual model that can be used to guide teams and coaches in their efforts to develop and maintain optimal functioning in the context of high performance curling. Thus, my participation will contribute to the practice of Canadian curling coaches as the results will be used to develop workshops and/or online training modules for the Canadian Curling Association.

Anonymity and confidentiality: The information I will share in this study will be kept strictly anonymous and confidential by the researchers. However, I realize that I cannot control whether or not my teammates will share content from the focus group interviews with others. Nonetheless, all participants will be asked to keep confidential what is shared in the group. I will be assigned a code and my name, as well as any information that could reveal my identity in the interview transcripts, questionnaires, scientific articles, and conference presentations will be excluded. The audiotapes, transcripts, and any printed document will be stored in a locked filing cabinet in Dr. Durand-Bush's laboratory at the University of Ottawa for a period of five years, after which they will be destroyed. Any electronic documents will be saved on the primary researcher's password protected computer until completion of the project and subsequently on Dr. Durand-Bush's password protected computer and they will be the only individuals able to access these documents. After the five years over which the data must be conserved, the electronic documents will be permanently deleted. Also, I will receive my interview transcripts by email or mail based on my preference so that I can verify the content. If I choose the email option, I accept that anonymity and confidentiality will not be 100% guaranteed. I will have the opportunity to read the transcript and make any desired changes to the document and send it back via email or mail (in a self-addressed stamped envelope provided) to the researcher.

Voluntary participation: My participation in this study is completely voluntary. I may withdraw from the study at any time and/or refuse to answer questions without any negative consequence. If I choose to withdraw from the study, the data collected up until that point will be securely stored as described above or destroyed if that is my preference.

Consent. I, _____, accept to participate in this study conducted by Jamie Collins, PhD (can) and her thesis supervisor, Natalie Durand-Bush, PhD, from the School of Human Kinetics, Faculty of Health Sciences, University of Ottawa. I also accept that my participation in the focus group interview and any subsequent telephone interview will be tape-recorded and that the anonymous results of this study will be published in scientific articles and presented at conferences. Should a follow-up interview be necessary, the researcher has permission to contact me:

- ☐ Yes, the researcher can contact me by:
  - Email (_____)
  - Phone (_____)
- ☐ No, I do not wish to be contacted for a follow-up interview

For any additional information regarding this study, I may contact the researchers. Any information requests or complaints about the ethical conduct of the project may be addressed to the Protocol Officer for Ethics in Research, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON, K1N 6N5, tel.: 613-562-5387, email: ethics@uottawa.ca.

There are two copies of the consent form, one for myself that I may keep and one for the researcher.

Researcher's signature: _____ Date: _____

Athlete's signature: _____ Date: _____

Appendix D

Athlete Demographic Questionnaire

Please answer the following demographic questions by checking off the appropriate box and/or filling in the blank.

1. Participant ID: _____

2. Gender:
   - ☐ Male
   - ☐ Female

3. Name of team on which you are currently playing: _____
   - Number of years on current team: _____

   Name of team(s) on which you previously played: _____
   Number of years on previous team(s): _____

4. Level of current team:
   - ☐ Junior
   - ☐ Senior

5. How involved is your coach on your current team?
   Not Involved 1 2 3 4 5 6 7 Highly Involved
   Please explain: _____
   _____
   _____
   _____

6. Approximately how many hours do you spend interacting with your coach on a daily, weekly, monthly basis in the following contexts:
   - Competition? Daily: _____ Weekly: _____ Monthly: _____
   - Training? Daily: _____ Weekly: _____ Monthly: _____
   - Organization/management? Daily: _____ Weekly: _____ Monthly: _____
   - Other (please specify) Daily: _____ Weekly: _____ Monthly: _____

7. Do you perceive your team to be performing well under your coach right now?
   - ☐ Yes
   - ☐ No

   Please justify: _____
   _____
   _____
   _____

8. Who helps your team work together as a group? Check all boxes that apply.
   - ☐ Coach
   - ☐ Teammates (specify who if anyone in particular): _____
   - ☐ Mental performance consultant
   - ☐ Other (specify): _____

9. Would you be willing to participate in a follow-up interview should it be deemed necessary by the researcher?

   Yes, here is my contact information:

   _____

   _____

   No

Appendix E

Athlete Exit Questionnaire

Please answer the following exit questions by checking off the appropriate box and/or filling in the blanks.

1. Participant ID: _____

2. Name of team on which you are currently playing:
   _____

3. To what extent do you agree with what was said during this focus group interview?
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

   Comments: _____
   _____
   _____
   _____
   _____
   _____
   _____

4. To what extent do you think your coach would agree with what was said during this focus group interview?
   Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

   Comments: _____
   _____
   _____
   _____
   _____
   _____
   _____

5. Is there anything else that you would like to add in confidentiality?

   Comments: _____
   _____
   _____
   _____
   _____
   _____
   _____

Appendix F

Individual Coach Interview Guide

Opening Questions:

1. Let's introduce ourselves. Can you please tell me your name, how long you've been coaching, both in general and on this team?

Introductory Questions:

2. What was the first thing that came to mind when you were asked to participate in a study on team dynamics in high performance curling?

3. What does 'team functioning' or 'team processes' mean to you?
   How important are team functioning and processes in HP curling?

Transition Questions:

4. Can you describe the nature of team processes within the team you are coaching?
   (Probe for topics such as verbal and non-verbal communication, day-to-day interactions, goal-setting, decision-making, chemistry, personalities, business versus friendship mindset, discipline, roles and responsibilities, leadership, task execution, social activities, conflict resolution, team proximity, etc.).

5. If you were to observe a video recording of your team on a 'good' day and a 'bad' day, what would you see/hear/think/feel?
   (Probe for verbal elements such as words and tone, and non-verbal behavior such as gestures, body language, feelings and emotions; of both the athletes and the coach).

Key Questions:

6. What contributes to optimal team functioning within your team?
   (*Probes – Is this considered during team formation? Is this discussed at various points in the season? When is team functioning at its best/worst (training versus competition) and why?)*

7. How does team functioning impact the athletes' individual and team performance? How about your performance as a coach?
   (Probe for examples and concrete outcomes in training and competitions and reasons for positive or negative impact)

8. What role do you play as a coach in optimizing team functioning on the team? How do you help athletes work and interact effectively with one another? Do you sometimes hinder team functioning? Explain how and why.
   (Probe regarding the level of coach involvement in organization, training/practice, and competition; if there are things that hinder team functioning, is the coach aware and does he/she do anything about it? Would you like to be more involved? If so, in what? What role would you like to play/ what would it look like? What would be the impact?)

9. Can you provide some specific examples of strategies that you use to facilitate team functioning, particularly in response to challenges, setbacks, or obstacles? What is the impact on their performance?
   (Probe to determine proactive strategies used when it's going well and reactive strategies executed in response to challenges/obstacles).

10. Who else on the team or affiliated with the team impacts team functioning? Explain how, why, and the outcome on performance. Are these individuals ever in conflict with you the coach or other team members? If so, explain how and why.
    (Probe for the level of the individual's involvement in organization, training/practice, and competition; role, strategies used to maintain team functioning or make changes in the face of difficulties, how this ultimately impacts performance, etc.).

Ending Question(s):

11. If you had a chance to give advice to other high performance coaches or athletes on how to optimize team functioning, what advice would you give?

12. Is there anything that you would like to add?

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Appendix G

Coach Consent Form

Title of study: DEVELOPING AND MAINTANING OPTIMAL TEAM FUNCTIONING IN CURLING: EXPLORING THE ROLE OF COACHES AND ATHLETES USING A GROUNDED THEORY APPROACH

Researchers: Jamie Collins, PhD (cand), and Natalie Durand-Bush, PhD, School of Human Kinetics, Faculty of Health Sciences, University of Ottawa.

Invitation: I am invited to participate in a PhD thesis study conducted by Jamie Collins and her thesis supervisor, Natalie Durand-Bush.

Purpose of study: The purpose of this study is to explore the factors involved in developing and maintaining optimal team functioning in high performance curling, with a specific emphasis on the role of the coach in this process.

Participation: My participation in this study will consist of completing a brief demographic questionnaire, which should take between 5 and 10 minutes. I will also partake in an individual interview with the primary researcher that will last approximately between 60 to 90 minutes. This interview will be audio-recorded and scheduled at a time and location convenient for both myself and the researcher. During this interview, I will be asked to share some demographic information and discuss the factors involved in developing and maintaining optimal team processes in high performance curling, as well as my role as a coach and provide specific examples of strategies that I use to facilitate this process.

Risks: There is very minimal risk involved in this study and I am free to withdraw at any time without negative consequence. I may experience discomfort when discussing issues or situations in which team processes are not optimal on the team I am coaching. However, the information that I choose to share is entirely up to me and the researcher will not encourage me to discuss anything with which I am uncomfortable. I know that I can contact the researcher during the study to address any questions or concerns I may have.

Benefits: There are several potential benefits from participating in this study. The present study will provide me with an opportunity to increase my awareness of team processes on my team. For example, I may become cognizant of things that I can do to promote optimal functioning on my team, or conversely, I may realize that certain behaviours or strategies may be detrimental. As optimal team processes have been associated with enhanced performance and increased member satisfaction, this may provide great benefit to my team and myself. Additionally, this study will lead to the development of a conceptual model that can be used to guide teams and coaches in their efforts to develop and maintain team processes in the context of high performance curling. Thus, my participation will contribute to the practice of Canadian curling coaches as the results will be used to develop workshops and/or online training modules for the Canadian Curling Association.

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Anonymity and confidentiality: The information I will share in this study will be kept strictly anonymous and confidential. I will be assigned a code and my name, as well as any information that could reveal my identity in the interview transcript, demographic questionnaire, scientific articles, and conference presentations will be excluded. The audiotapes, transcripts, and any printed document will be stored in a locked filing cabinet in Dr. Durand-Bush's laboratory at the University of Ottawa for a period of five years, after which they will be destroyed. Any electronic documents will be saved on the primary researcher's password protected computer until completion of the project and subsequently on Dr. Durand-Bush's password protected computer and they will be the only individuals able to access these documents. After the five years over which the data must be conserved, the electronic documents will be permanently deleted. Also, I will receive my interview transcript by email or mail based on my preference so that I can verify the content. If I choose the email option, I accept that anonymity and confidentiality will not be 100% guaranteed. I will have the opportunity to read the transcript and make any desired changes to the document and send it back via email or mail (in a self-addressed stamped envelope provided) to the researcher.

Voluntary participation: My participation in this study is completely voluntary. I may withdraw from the study at any time and/or refuse to answer questions without any negative consequence. If I choose to withdraw from the study, the data collected up until that point will be securely stored as described above or destroyed if that is my preference.

Consent. I, _____, accept to participate in this study conducted by Jamie Collins, PhD (can) and her thesis supervisor, Natalie Durand-Bush, PhD, from the School of Human Kinetics, Faculty of Health Sciences, University of Ottawa. I also accept that my participation in the individual interview will be tape-recorded and that the anonymous results of this study will be published in scientific articles and presented at conferences.

Should a follow-up interview be necessary, the researcher has permission to contact me:

- ☐ Yes, the researcher can contact me by:
  - Email (_____)
  - Phone (_____)
- ☐ No, I do not wish to be contacted for a follow-up interview

For any additional information regarding this study, I may contact the researchers. Any information requests or complaints about the ethical conduct of the project may be addressed to the Protocol Officer for Ethics in Research, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON, K1N 6N5, tel.: 613-562-5387, email: ethics@uottawa.ca.

There are two copies of the consent form, one for myself that I may keep and one for the researcher.

Researcher's signature: _____ Date: _____

Coach's signature: _____ Date: _____

Appendix H

Coach Demographic Questionnaire

Please answer the following demographic questions by checking off the appropriate box and/or filling in the blank.

1. Participant ID: _____

2. Gender:
   - ☐ Male
   - ☐ Female

3. Name of team you are currently coaching _____
   - Number of years coaching current team: _____
   - Number of years coaching overall: _____
   - Number of years coaching at the Junior level (if applicable): _____ Senior level: (if applicable) _____

Number of years competing as a high performance athlete at the Junior level (if applicable): _____ Senior level: (if applicable) _____

4. Level of current team:
   - ☐ Junior
   - ☐ Senior

5. How involved are you as a coach on this team?
   Not Involved 1 2 3 4 5 6 7 Highly Involved
   Please explain: _____
   _____
   _____
   _____

6. Approximately how many hours do you spend interacting with your team on a daily, weekly, monthly basis in the following coaching contexts:
   - Competition? Daily: _____ Weekly: _____ Monthly: _____
   - Training? Daily: _____ Weekly: _____ Monthly: _____
   - Organization/management? Daily: _____ Weekly: _____ Monthly: _____
   - Other (please specify) Daily: _____ Weekly: _____ Monthly: _____

7. Do you perceive your team to be performing well under your coaching right now?
   - ☐ Yes
   - ☐ No

   Please justify: _____
   _____
   _____
   _____

8. Who helps your team work together as a group? Check all boxes that apply.
   - ☐ You, the Coach
   - ☐ Team members (specify who if anyone in particular): _____
   - ☐ Mental performance consultant
   - ☐ Other (specify): _____

9. Would you be willing to participate in a follow-up interview should it be deemed necessary by the researcher?
   - ☐ Yes, here is my contact information:
     _____
     _____
   - ☐ No

Appendix I

Glossary of Terms

Individual Attributes	
Personal characteristics	The sum total of the physical, mental, emotional, and social characteristics of a member (e.g., competitive, patient, calm, focused, confident, etc.)
Individual sport competencies and characteristics	A member's ability to do something successfully or efficiently (competency) and the sport-related skills contributing to this ability (characteristics)
Team Attributes	
Relationship characteristics	Mutual dealings, connections, or feelings that exist between members
Team sport competencies and characteristics	A team's ability to do something successfully or efficiently (competency) and the sport-related skills contributing to this team ability (characteristics)
Communicate	
Convey information through the exchange of knowledge, data, thoughts, and/or feelings by verbal (e.g., speech), non-verbal (e.g., visuals, signals), or written (e.g., text) means; send, receive, and interpret messages	
Structural Team Processes	
Select members	Choose specific team members in preference to another or others
Set goals	Determine the object of an individual member and the team's ambition and effort; establish the purpose, aim or desired result
Establish roles	Establish the function assumed or the part played by a member in a particular situation
Create norms	Create a team-held belief about how members should behave in a given context
Clarify expectations	Clarify the degree of probability that something will occur in the future (e.g., behaviour, outcome)
Individual Regulation Processes	
Remain aware	Know that something exists (e.g., situation, condition, problem); feel, experience, or notice something (e.g., sound, sensation, emotion)
Prepare	Make ready or suitable in advance for a particular purpose

Exert self-control	Regulate actions, thoughts, and emotions; control desires and impulses
Take responsibility	Take responsibility or account for actions
Adapt	To fit, change, or modify to suit a new or different purpose
Team Regulation Processes	
Interact	Act or come together as members and have an effect on each other; not necessarily intentional
Support	Give help or assistance to a member; not necessarily reciprocal
Cooperate	Work with another member or the team to do something or act in a way that makes something possible or likely; reciprocal
Make decisions	Select a belief or an action from available options
Problem solve	Work through details of problem to reach a solution
Lead	Guide or direct members; engage them in achieving a common purpose
Context	
A set of circumstances, conditions or facts that surround a particular event or situation (e.g., competition, score)	
Desired Outcomes	
Expected/desired outcome of an activity or process; can be individual (e.g., performance, enjoyment, self-efficacy) or team (e.g., performance, cohesion) based	