AN EXAMINATION OF COACH-ATHLETE INTERACTIONS IN A MODEL SPORT PROGRAM FOR ATHLETES WITH DISABILITIES

by

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Abstract

The purpose of this study was to analyze the coach-athlete interactions occurring in a successful sport program for athletes with disabilities and their able-bodied siblings. The successful nature of this program was established by its athletes’ competitive achievements and by the athletes’ reports of positive experiences within this sport environment. This study utilized state space grid and observational methodology and was the second application of this methodology in field-based sport psychology research (Erickson, Côté, Hollenstein, & Deakin, in press). The head coach of the program and twenty-four athletes were observed over multiple practice sessions. Both coach and athlete behaviour was coded continuously for the duration of each practice session. Measures of coach-athlete interaction structure, based on dynamic systems concepts, were derived from these coded behaviours. These measures were examined for the team as a whole and compared between groups within the team (competitive vs. recreational athletes and athletes with disabilities vs. able-bodied athletes). Results indicated that the coach-athlete interactions of the team were highly patterned. Within this consistent pattern, the coach spent most of her time silently observing the athletes. Other commonly exhibited behaviours included individualized technical instruction, organization, and positive feedback. With regards to behavioural sequencing, the coach’s time spent observing the athletes was often interspersed with periods of organization, instruction, and feedback. The coach appeared to adapt her coaching style according to the competitive levels of the athletes, but no differences emerged when comparing the coach-athlete interactions between athletes with disabilities and able-bodied athletes. Overall,
this successful sport environment was characterized by positive coach-athlete interactions that were deliberately patterned and mutually respectful.
Co-Authorship

This thesis presents the original work of Jennifer Murphy-Mills in collaboration with her advisors, Dr. Jean Côté and Dr. Janice Deakin.
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# Table of Contents

Abstract ........................................................................................................................................... ii
Co-Authorship .................................................................................................................................. iv
Acknowledgements .......................................................................................................................... v
List of Figures ................................................................................................................................... ix
List of Tables ..................................................................................................................................... x
Chapter 1 Introduction ..................................................................................................................... 1
Chapter 2 Literature Review ............................................................................................................. 4
Methodologies in Coach-Athlete Interaction Research ................................................................. 7
  Qualitative coaching research ......................................................................................................... 8
  Questionnaire based coaching research ......................................................................................... 10
  Observational coaching research .................................................................................................... 12
  Coaching behaviours ....................................................................................................................... 15
    Instruction ..................................................................................................................................... 16
    Organization ................................................................................................................................... 17
    Feedback ......................................................................................................................................... 18
    Silence/observation ...................................................................................................................... 20
Limitations in Coaching Research .................................................................................................. 20
Dynamic Systems and the State Space Grid Method ........................................................................ 23
Coaching in Disability Sport .............................................................................................................. 28
Purpose of the Study .......................................................................................................................... 31
Chapter 3 Methods ............................................................................................................................ 32
Participants ......................................................................................................................................... 32
  Description of the program ............................................................................................................. 33
Procedure .......................................................................................................................................... 33
Measures ........................................................................................................................................... 35
  Youth Experience Survey for Sport ................................................................................................. 35
  Basic Need Satisfaction in Relationships Scale .............................................................................. 35
Coach-Athlete Interaction Measure ................................................................................................ 36
  Coach and athlete behaviour content ............................................................................................. 37
  Contextual validity ........................................................................................................................... 40
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coder training and reliability.</td>
<td>41</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>41</td>
</tr>
<tr>
<td>Variability</td>
<td>43</td>
</tr>
<tr>
<td>Attractor states</td>
<td>44</td>
</tr>
<tr>
<td>Transitions and sequences</td>
<td>45</td>
</tr>
<tr>
<td>Chapter 4 Results</td>
<td>46</td>
</tr>
<tr>
<td>Coach and Athlete Behavioural Content: State Space Grid Analysis</td>
<td>47</td>
</tr>
<tr>
<td>Variability</td>
<td>48</td>
</tr>
<tr>
<td>Attractor States</td>
<td>50</td>
</tr>
<tr>
<td>Athletes engaged in practice activities</td>
<td>50</td>
</tr>
<tr>
<td>Athletes’ Interactions</td>
<td>54</td>
</tr>
<tr>
<td>Transitions and Sequences</td>
<td>55</td>
</tr>
<tr>
<td>Chapter 5 Discussion</td>
<td>61</td>
</tr>
<tr>
<td>Variability</td>
<td>61</td>
</tr>
<tr>
<td>Coach’s Behavioural Content Patterns</td>
<td>63</td>
</tr>
<tr>
<td>Use of silence/observation</td>
<td>63</td>
</tr>
<tr>
<td>Use of organization</td>
<td>64</td>
</tr>
<tr>
<td>Use of instruction</td>
<td>66</td>
</tr>
<tr>
<td>Use of feedback</td>
<td>67</td>
</tr>
<tr>
<td>Additional behavioural content patterns</td>
<td>68</td>
</tr>
<tr>
<td>Athletes’ Behaviours</td>
<td>70</td>
</tr>
<tr>
<td>Coach Behaviour Transitions and Sequences</td>
<td>70</td>
</tr>
<tr>
<td>Comparisons between Groups</td>
<td>71</td>
</tr>
<tr>
<td>Integrated Picture of Coach-Athlete Interactions</td>
<td>74</td>
</tr>
<tr>
<td>Chapter 6 Conclusions</td>
<td>76</td>
</tr>
<tr>
<td>Limitations and Future Directions</td>
<td>77</td>
</tr>
<tr>
<td>References</td>
<td>79</td>
</tr>
<tr>
<td>Appendix A Letters of Information</td>
<td>100</td>
</tr>
<tr>
<td>Appendix B Consent Forms</td>
<td>103</td>
</tr>
<tr>
<td>Appendix C Questionnaire</td>
<td>106</td>
</tr>
<tr>
<td>Appendix D Coding Manual</td>
<td>111</td>
</tr>
<tr>
<td>Appendix E Tables</td>
<td>121</td>
</tr>
</tbody>
</table>
List of Figures

Figure 1. Example of a SSG trajectory for one coach-athlete dyad during a practice with general classification of coaches’ and athletes’ behavioural categories........................................43

Figure 2. SSG for one coach-athlete dyad displaying summed trajectories across practices......49

Figure 3. The lagged phase plot SSG’s for the coach summed across all practices, with coach behaviour at a given time on the x-axis and the subsequent coach behaviour (lag) on the y-axis. 56

Figure 4. The lagged phase plot SSG’s for the coach summed across all practices, with both first and second order transitions.................................................................60
List of Tables

Table 1. Descriptive statistics of the YES-S and the BNSRS

Table 2. Mean duration (seconds) and mean number of visits per practice session for coach behaviours while athletes were engaged in practice activities

Table 3. Percentage of practice time of coach behaviours while the athletes were engaged in practice activities

Table 4. ANOVA results table when comparing the time effects on the content of coach behaviours between competitive and recreational athletes

Table 5. ANOVA results table when comparing the time effects on the content of coach behaviours between able bodied athletes and athletes with disabilities

Table 6. Mean visits per practice session and transitional probabilities of frequently occurring coach behaviour sequences

Table 7. Athlete characteristics

Table 8. Pearson correlation coefficients for the subscales of the YES-S and BNSRS

Table 9. Comparison of the responses of competitive and recreational athletes on the YES-S and the BNSRS

Table 10. Comparison of the responses of able bodied athletes and athletes with disabilities on the YES-S and the BNSRS

Table 11. ANOVA results table when comparing the group effects on the content of coach behaviours between able bodied athletes and athletes with disabilities
Chapter 1

Introduction

Organized sport plays an important role in youth development. There is an extensive body of literature that links sport participation with positive outcomes, including the development of leadership skills, enhanced academic achievement, and increased prosocial behaviour (Eccles, Barber, Stone, & Hunt, 2003; Elley & Kirk, 2002; Rutten, Stams, Biesta, Schuengal, Dirks, & Hoeksma, 2007). However, evidence exists to suggest that involvement in sport can also be associated with negative outcomes, such as increased aggression and alcohol consumption, and decreased moral reasoning (Eccles & Barber, 1999; Gardner & Janelle, 2002; Lemyre, Roberts, & Ommundsen, 2002). The existence of conflicting results illustrates that participation in sport does not necessarily translate into positive developmental experiences. As a result, there is a need to further understand the features of the sport environment that may contribute to youth’s positive or negative development.

One aspect of the sport setting that may account for the disparity in youth’s developmental experiences is the influence of the coach. It is well documented that coaches can exert a significant influence on athletes’ sport experiences and developmental outcomes through their interactions with their athletes (Fraser-Thomas, Côté, & Deakin, 2005; Smith & Smoll, 1990). Indeed, previous research suggests that coaches can serve as important role models for their athletes and can also have a

1
considerable impact on their athletes’ physical, psychological, and social well-being (Horn, 2002). Therefore, coach-athlete interactions may serve as an effective avenue through which to foster positive development in youth sport.

As might be expected, the majority of studies pertaining to the role coaches play in promoting positive youth development focus on coaches of able-bodied athletes (e.g., Fraser-Thomas et al., 2005; Vella, Oades, & Crowe, 2011). Empirical research examining coaches of athletes with disabilities is limited (Cregan, Bloom, & Reid, 2007). Although coaching athletes with disabilities requires many of the same skills as coaching able-bodied athletes, research suggests that there are several circumstances and considerations that are specific to coaching athletes with disabilities. For example, coaches may need to develop an understanding of the nature of the disability and its necessary biomechanical adaptations (DePauw & Gavron, 2005). Moreover, coaches may need to develop individualized training plans to suit each athlete’s condition and specific needs (Cregan et al., 2007). Because coaching athletes with disabilities presents a unique set of challenges for coaches attempting to facilitate youth development through sport (Rimmer, Rowland, & Yamaki, 2007), an investigation of the coach-athlete interactions specifically within the disability sport context is warranted.

The need for research examining coach-athlete interactions in disability sport is further underscored by the fact that while there have been several studies to demonstrate the positive outcomes of sport participation for athletes with disabilities (e.g., Blinde & McClung, 1997; Giacobbi, Stancil, Hardin, & Bryant, 2008; Martin, 2006), studies
evaluating how these outcomes can be acquired are limited. With this in mind, the present study sought to address how the coaching process may be associated with athletes’ personal development outcomes. More specifically, the purpose of this study was to examine the influence of coach-athlete interactions on athlete development in a highly successful sport program that includes both athletes with disabilities and their able bodied siblings.

Furthermore, since the athletes of this successful program also represented a wide range of competitive levels, another aim of this study was to assess how coach-athlete interactions differed according to the competitive level of the athletes. Côté, Young, North, and Duffy (2007) and Côté, Bruner, Erickson, Strachan and Fraser-Thomas (2010) recently outlined a typology of 4 different categories of coaches based on different developmental contexts: (a) participation coaches for children, (b) participation coaches for adolescents, (c) performance coaches for young adolescents, and (d) performance coaches for older adolescents and adults. They suggest that each of these different contexts has different athlete needs and considerations, and thus the methods by which coaches can promote positive athlete outcomes will depend on the age and competitive level of the athletes they coach. By evaluating the nature of one coach's interactions with a diverse range of athletes, the present case study sought to enhance our understanding of the influence of specific athlete characteristics on the coaching process.
Chapter 2

Literature Review

Recent theoretical and applied research suggests examining the factors and experiences that may influence youth development from a positive or “asset-building” perspective that views youth as a resource to be developed, rather than a problem to be solved (Benson, 1997; Damon, 2004; Dworkin, Larson, & Hanson, 2003; Lerner et al., 2005). Due to its popularity and the significant amount of time youth spend in sport in comparison to other extracurricular activities (Larson & Verma, 1999; Guèvremont, Findlay, & Kohen, 2008), sport is promoted as an appropriate avenue through which positive physical, psychological, and social development can be facilitated. Empirical research is beginning to verify this claim by suggesting associations between sport participation and a myriad of positive outcomes (e.g., Hansen, Larson, & Dworkin, 2003; Larson, 2000; Martinek, Schilling, & Hellison, 2006; Strong et al., 2005). For example, participation in sport is linked with improved physical health, the acquisition of motor skills, and the development of critical psychosocial skills (Côté & Fraser-Thomas, 2007).

Although the existing literature primarily focuses on the experiences of able-bodied athletes, the benefits of sport participation for athletes with disabilities are also well documented. Previous studies indicate that individuals with disabilities can derive numerous physical benefits from engagement in sport and physical activity. Some of these benefits include reduced risk of depression and anxiety, improved muscular
strength and cardiovascular fitness, gains in overall physical functioning, and enhanced quality of life (e.g., Blundell, Shepherd, Dean, & Adams, 2003; Groff, Lawrence, & Grivna, 2006; Hutzler & Bar-Eli, 1993; McBurney, Taylor, Dodd, & Graham, 2003; Rimmer, 2001).

Additionally, there are several important psychosocial benefits associated with participation in sport for athletes with disabilities (Martin & Smith, 2002). Previous research suggests that sport can have a positive influence on the way in which individuals view their bodies and may serve as a means to counter the negative social stereotypes and stigma commonly experienced by athletes with disabilities (e.g., Giacobbi et al., 2008; Taub, Blinde, & Greer, 1999). Research also indicates that sport may be a context which can provide opportunities for friendship and social support, enhance affective states such as enjoyment, and facilitate the development of independence and self-efficacy (e.g., Blinde & McClung, 1997; Giacobbi et al., 2006; Martin, 1999; Martin & Smith, 2002). Furthermore, Goodwin and colleagues (2009) posit that sport programs have the potential to foster an increased sense of community among athletes with disabilities. Given the various benefits that are linked with participation in sport, it is evident that sport has a significant effect on the physical, psychological, and social development of athletes with disabilities. However, while previous studies have investigated the types of developmental outcomes which may be fostered through disability sport, studies evaluating how these outcomes can be acquired are limited.
One aspect of the sport environment that plays a critical role in youth’s sport experiences is the coach (Greendorfer, 2002). Over the last thirty years, researchers have examined the role of sport coaches in fostering positive youth development through their behaviours and interactions with athletes (e.g., Conroy & Coatsworth, 2004; Curtis, Smith, & Smoll, 1979; Kenow & Williams, 1999; Smith & Cushion, 2006). This body of literature provides consistent evidence that coaches are an important influence on youth’s sport experiences, including youth’s enjoyment and withdrawal (Barnett, Smoll, & Smith, 1992; Liukkonen, 1999), perceived competence (Balaguer, Duda, Atienza, & Mayo, 2002; Black & Weiss, 1992; Sarrazin, Guillet, & Cury, 2001), motivation (Amorose & Horn, 2000; Hollembeak & Amorose, 2005; Mageau & Vallerand, 2003) and self-esteem (Smith & Smoll, 1990; Smoll, Smith, Barnett, & Everett, 1993).

Despite the extensive body of literature that exists on youth sport coaching, there is a paucity of research that focuses on coaches of athletes with disabilities (Cregan et al., 2007). Indeed, prominent researchers suggest that the field of sport psychology has done a poor job of addressing the needs of athletes with disabilities (Asken & Goodling, 1986; Crocker, 1993; DePauw & Gavron, 2005). In 1986, the US Olympic Committee formed the Committee on Sport for the Disabled and identified coaching as a research priority area (DePauw & Gavron, 2005; Reid & Prupas, 1998). However, in a review of the literature from 1986 to 1996, Reid and Prupas (1998) found only five published articles relating to the topic of coaching athletes with disabilities. This number pales in
comparison to the 339 articles Gilbert and Trudel (2004) found in a similar time period (1986-1997) relating to the topic of coaching able-bodied athletes.

Due to this lack of research on coaches of athletes with disabilities, Cregan and colleagues (2007) suggest that it may be appropriate to draw upon the literature on coaches of able-bodied athletes to explore the influence of coaches on athlete development. Thus, the aim of the following sections is to: (a) highlight the methodological approaches utilized to examine the relationship between coaches’ behaviours and athletes’ outcomes within the able-bodied sport context, (b) elaborate on the coaching behaviours commonly employed by youth sport coaches, (c) outline the limitations that exist in the current coaching literature, (d) explore the contribution of a novel methodology to the study of coach-athlete interactions in youth sport and (e) review the coaching literature that exists on disability sport.

Methodologies in Coach-Athlete Interaction Research

A number of approaches have been taken within the sport psychology literature to investigate the ways in which coaches’ interactions with their athletes may contribute to youth’s experiences in sport. These various approaches can be organized into three broad categories: qualitative methods, questionnaire measures, and systematic observation. Qualitative approaches have shed light on both coaches’ and athletes’ perceptions of effective coaching behaviours and coaching strategies (e.g. Côté & Sedgwick, 2003; Culver & Trudel, 2000; Sedgwick, Côté, & Dowd, 1997). Alternatively, studies using questionnaires such as the Coaching Behaviour Scale for Sport (CBS-S; Côté, Yardley,
Hay, Sedgwick, & Baker, 1999), the Leadership Scale for Sport (LSS; Chelladurai & Saleh, 1980), and the Coaching Behaviour Questionnaire (CBQ; Martin & Barnes, 1999) have assessed the impact of perceived coaching behaviours on a myriad of athlete outcomes (e.g. Baker, Yardley, & Côté, 2003; Chelladurai, Imamura, Yamaguchi, Oinuma, & Miyaiuchi, 1988; Kenow & Williams, 1999). Finally, researchers have utilized systematic observation instruments, including the Coaching Behaviour Recording Form (Tharp & Gallimore, 1976), the Arizona State University Observation Instrument (ASUOI; Lacy & Darst, 1984), and the Coaching Behaviour Assessment System (CBAS; Smith, Smoll, & Hunt, 1977) to elucidate the relationship between observed coaching behaviours and various psycho-social variables in athletes.

**Qualitative coaching research.**

Recently, researchers have expressed a growing interest in employing qualitative and mixed-method approaches to examine several aspects of coaching behaviours and coach-athlete relationships (e.g., Becker, 2009; Culver & Trudel, 2000; Philippe & Seiler, 2006; Potrac, Jones, & Armour, 2002). For instance, a series of studies by Jowett and colleagues illustrated how the factors of closeness, commitment, and complementarity and co-orientation can act as important determinants of the quality of coach-athlete relationships (e.g., Jowett & Cockerill, 2003; Jowett & Meek, 2000; Trzaskoma-Bicsérdy, Bognár, Révész, & Géczi, 2007). Qualitative studies have also explored coaches’ and athletes’ perceptions of coaching behaviours that may contribute to positive sport experiences (e.g., Côté & Sedgwick, 2003; Keegan, Spray, Harwood, & Lavallee,
While the results of such studies often complement previous research emphasizing the importance of coaching behaviours such as instruction, feedback, and behavioural reinforcement (e.g. Keegan, Harwood, Spray & Lavallee, 2009), they have also uncovered unique dimensions of effective coaching behaviours that had not surfaced with quantitative measures of coaching effectiveness. For example, behaviours such as recognizing individual differences (Côté & Sedgwick, 2003) and ‘one-to-one’ coaching (Keegan et al., 2009) have been identified as examples of coaching behaviours that may play a key role in promoting positive athlete outcomes.

Researchers have also used qualitative methods to more directly address positive athlete development. For example, Gould, Collins, Lauer, and Chung (2007) employed in depth interviews to examine the life skill promoting strategies employed by award winning high school football coaches. Results indicated that coaches had definite and specific strategies for fostering personal development in their athletes. These strategies included holding players to high expectations, developing individualized programs, reinforcing expected behaviours, discussing and reprimanding inappropriate behaviours, and setting up procedures for dealing with parents and officials. The findings of this study are congruent with previous research which highlights that working with athletes and building strong, personal relationships can positively influence athletes’ sport experiences (Jowett & Poczwardowski, 2007).

Collectively, these studies highlight how qualitative methods can be effectively used to examine the coaching process. In particular, these studies help to illuminate
coaches’ and athletes’ perceptions of both effective coaching behaviours and strategies to promote positive development. While qualitative methods offer many advantages to researchers, they also entail some limitations. Since qualitative techniques are intended to provide a more in-depth understanding of the phenomena under investigation, the generalizability of the findings from qualitative studies are often limited by the small number of participants. Moreover, due to the lack of control groups in qualitative studies, it can be difficult to establish direct links between coaching behaviours and athlete outcomes. One methodological approach that attempts to address some of these limitations is questionnaire based research.

**Questionnaire based coaching research.**

Over the years, many researchers have employed a quantitative approach to investigate the relationship between coaches’ behaviours and athletes’ experiences. In a recent review of the coaching literature published between 1970 and 2001, Gilbert and Trudel (2004) found that questionnaires were the most commonly used method of data collection. Indeed, of the 610 coaching articles compiled in the review, questionnaires were used in nearly 70% of the studies (Gilbert & Trudel, 2004).

One of the most prominent lines of questionnaire-based research within the coaching literature centres on the Leadership Scale for Sport (LSS), Chelladurai and Saleh (1980) constructed the LSS to explore athletes’ perceptions and preferences of coach behaviour, as well as coaches’ perceptions of their own behaviours. The LSS consists of five subscales, two of which assess the coach’s decision making style.
(democratic and autocratic), two of which assess the coach’s motivational tendencies
(social support and positive feedback) and one that assesses the coach’s instructional
behaviour (training and instruction). Since its inception, the LSS has been used
extensively to investigate the influence of variables, such as gender, age, and personality,
on preferred and/or perceived leadership behaviour (e.g., Dwyer & Fischer, 1988, 1990;
Terry, 1984; Terry & Howe, 1984; Sherman, Fuller, & Speed, 2000). Additionally,

studies employing the LSS have examined the congruence between perceived and
preferred forms of leadership and athletes’ performance and satisfaction (e.g.,
Chelladurai & Riemer, 1998). Results of previous studies consistently indicate that
athlete satisfaction is positively associated with a democratic leadership style as
perceived by athletes and negatively associated with an autocratic leadership style. More
specifically, this research suggests that leadership behaviours associated with training and
instruction, positive feedback, and social support can be linked with athletes’ satisfaction
(Horn, 2002) and intrinsic motivation (Amorose & Horn, 2000).

Another line of research has explored the importance of autonomy supportive
coaching behaviours in facilitating positive athlete outcomes using quantitative
questionnaires (e.g., Amorose & Horn, 2000, 2001; Black & Weiss, 1992; Gagné, Ryan &
Bargman, 2003; Mageau & Vallerand, 2003; Pelletier, Fortier, Vallerand & Briere,
coaching behaviours that may influence the quality of youth’s sport experiences,
including (a) providing athletes with choice, (b) providing opportunities for initiative-
taking, (c) using a democratic leadership style, (d) giving a rationale for their actions, (e) showing concern for the athlete both on and off the field, (f) giving constructive feedback, and (g) fostering a task-oriented sport environment. Previous studies consistently demonstrate that athletes who perceive their coaches’ behaviours to be autonomy supportive experience more positive outcomes, such as increased enjoyment, performance, persistence, and concentration (Amorose & Horn, 2000, 2001; Black & Weiss, 1992; Gagné et al., 2003). Alternatively, athletes whose coaches exhibit behaviours that are controlling or coercive in nature, or employ an autocratic leadership style tend to experience lower levels of positive outcomes (Mageau & Vallerand, 2003).

Overall, studies using a questionnaire-based approach have provided a wealth of insightful information regarding the role of coaches in shaping youth development in sport. However, although many previous studies have examined athletes’ perceptions of coach-athlete interactions in sport, few studies have attempted to confirm the accuracy of these perceptions. Consequently, the adoption of approaches that can explore the question of perception-behaviour consistency may be necessary. One methodology that may help to address this gap is behavioural observation.

**Observational coaching research.**

A third major approach to the study of coaching behaviours involves employing observational techniques to elucidate the relationship between coach-athlete behaviours and athlete development. Stemming from Tharp and Gallimore’s (1976) observation of renowned basketball coach, John Wooden, a number of studies have used observational
methods to analyze the effects of coaching behaviours on athlete outcomes (e.g., Cushion & Jones, 2001; Fisher, Mancini, Hirsch, Proulx, & Staurowsky, 1982, Smith & Cushion, 2006). This approach has led to the development of a variety of systematic observation tools, including the Arizona State University Observation Instrument (ASUOI; Lacy & Darst, 1984), the Coaching Behaviour Recording Form (Tharp & Gallimore, 1976) and the Coaching Behaviour Assessment System (Smith et al., 1977).

In one of the most prominent lines of observational research, Smith, Smoll, and colleagues (Curtis, Smith, & Smoll, 1979; Smith & Smoll, 1990; Smoll, Smith, Curtis, & Hunt, 1978; Smith, Zane, Smoll, & Coppel, 1983) used observational techniques to investigate the association between youth sport coaches’ behaviours and athletes’ experiences. In order to code coach behaviours, Smith and colleagues developed the Coaching Behaviour Assessment System (CBAS; Smith et al., 1977). The CBAS consists of 12 behavioural categories (eight in response to athlete behaviour and four initiated by the coach) that were developed through detailed observation of coaches in a variety of youth sports. Smith, Smoll, and colleagues utilized the CBAS to create behavioural profiles for youth sport coaches by calculating the relative frequency of expression of the distinct behavioural categories. This line of research was complemented by the administration of interviews and questionnaires to youth sport participants to assess the relationships between coaches’ actual behaviours and athletes’ perceptions of coach behaviours, their sport experiences, and themselves (Magill, Ash, & Smoll, 1982).
In general, Smith, Smoll, and colleagues (Curtis et al., 1979; Smith & Smoll, 1990; Smith et al., 1983) suggest that youth sport coaches who exhibit higher levels of supportive and instructional behaviours are rated more positively by their athletes. Additionally, they propose that athletes of coaches who present these behaviours report having more fun and being more satisfied with their coach and teammates in comparison to athletes of coaches whose behaviours are more punitive in nature. Curtis et al. (1979) also noted a consistently low correlation between coaches’ observed and self-reported behaviour. Coaches’ perceptions of their own behaviours had little congruence with the objective behaviours they exhibited and their observed behaviours were much more strongly related to athlete outcomes. This finding lends support to the view that the direct observation of coach-athlete interactions, in comparison to self-report methods, may enable researchers to gain a more complete understanding of coach-athlete interactions.

Building upon the results of these descriptive and correlative studies, Smith, Smoll, and colleagues developed the Coach Effectiveness Training program (CET; Smith & Smoll, 1997; Smith & Smoll, 2002). The CET program advocates a philosophy that emphasizes the importance of learning, effort, and improvement, as opposed to objectively evaluated successes, such as win-loss records. This program teaches coaches general principles related to the role of sport in youth development and provides behavioural strategies (e.g., providing encouragement and instruction and avoiding sarcasm) that are intended to help coaches create a positive sport environment (Smith & Smoll, 1997; Smith & Smoll, 2002). By implementing this training program with a
variety of youth sport coaches, previous research demonstrates the efficacy of this program in altering coach behaviour and promoting positive athlete outcomes (Barnett et al., 1992; Coatsworth & Conroy, 2006; Smith & Smoll, 1997; Smoll, Smith, & Barnett, 1995; Smoll, Smith et al., 1993; Smith, Smoll, & Curtis, 1979). More specifically, results of these studies suggest that athletes of coaches who participated in the CET program reported having more fun, had lower levels of attrition, and evaluated their coaches, teammates, and their sport experiences more positively than athletes of untrained coaches. Collectively, these studies highlight the important role which coaches may play in promoting positive development in youth sport. Further, this body of literatures provides support for the contention that specific coach behaviours are more effective at facilitating positive athlete outcomes. These specific behaviours are reviewed in the next section.

**Coaching behaviours.**

One of the key goals of observational coaching research is to determine the types of coaching behaviours that coaches display and to examine the relationship between these behaviours and athletes’ sport experiences. As might be expected, coaches can exhibit a wide range of behaviours in their interactions with their athletes. For example, interactions may involve instructional behaviours such as providing instruction and organizing activities, as well as interpersonal behaviours such as providing feedback, praise, or punishment (Smith & Smoll, 2007). There is a growing body of literature that emphasizes the importance of these different types of coaching behaviours in facilitating
athletes’ development (Horn, 2002; Jones, Housner, & Kornspan, 1997). Indeed, as illustrated by the work of Smith, Smoll, and other sport researchers, effective coaching behaviours can influence athletes’ levels of performance, enjoyment, persistence, and confidence (Mageau & Vallerand, 2003). The aim of the following section is thus to provide an outline of four coaching behaviours that consistently appear in coaching research and that may be linked with positive development in youth sport: (a) instruction, (b) organization, (c) feedback, and (d) silence/observation.

**Instruction.**

Coach instruction refers to the communication of information to athletes. In many sport environments, instruction consumes a large proportion of practice time (Douge & Hastie, 1993). According to Landin (1994), high quality instruction can be characterized by clarity, the use of demonstration, and the delivery of cues that are accurate, informative, and appropriate in frequency. Consistent with this perspective, several studies have demonstrated links between the quality of coaches’ instructional behaviour and athlete learning (e.g., DeMarco, Mancini, & Wuest, 1997; Gallimore & Tharp, 2004). In addition, previous research employing questionnaires, such as the LSS, indicates that training and instructional behaviours can also be associated with athlete outcomes other than learning, including athletes’ satisfaction (Horn, 2002) and motivation (Amorose & Horn, 2000).
Another key function of coaches is to organize and manage the practice environment. In their observation of ten high school basketball coaches, Lacy and Goldston (1990) revealed that management was the third most frequently exhibited coaching behaviour, accounting for 15.3% of all behaviours over the course of a season. Similarly, in their analysis of youth ice hockey coaches and players over forty training sessions, Trudel and Brunelle (1985, as cited by Trudel, Côté, & Bernard, 1996) found that the coaches’ roles primarily consisted of organizing the athletes. While these studies illustrate that organizational behaviour may be an important component of the coaching process, it remains unclear how much organization is optimal for athlete development. For example, Claxton (1988) indicated that more successful high school tennis coaches used far fewer instances of organizational behaviour than did less successful coaches. These findings are supported by More and Franks (1996) who suggest that effective coaches spend less time organizing their athletes, which may enable them to spend a greater proportion of their time providing performance related instruction and feedback to their athletes. Collectively, these studies illustrate that while organization can be an effective coaching tool, coaches need to ensure that it is not used at the expense of more interactive behaviours with athletes, such as technical instruction and feedback. This is particularly important given the established links between instructional and reinforcement coaching behaviours and athletes outcomes, such as self-esteem (Smith & Smoll, 1990).
Another critical element of coaching is the ability to appropriately and adequately modify athlete behaviour. By exhibiting behaviours such as feedback, praise, and punishment, coaches hope that performance will be improved and athletes will learn the skills necessary to succeed. Drawing upon the motor learning literature, feedback enables learning, not necessarily due to the reward or punishment of responses, but due to the provision of information about a previous performance and suggestions of how to improve in subsequent performances (More & Franks, 2006). According to Magill (1993), effective feedback should thus contain informational content to direct the learner’s attention to a specific aspect of performance. Extending these propositions to the sport context, previous research suggests that coaches’ feedback should go beyond simple praise or punishment (e.g., Good job, not like that), and should include some degree of informational content (e.g., Good job, but next time try to keep your arm straight). This informational content can either reinforce correct aspects of the athletes’ performance or can identify discrepancies between actual and desired techniques so that performance can be modified.

In their pioneering work, Tharp and Gallimore (1976) observed the coaching behaviours of John Wooden and found that his use of corrective feedback nearly doubled his use of praise. Similarly, a study conducted by Markland and Martinek (1988) with high school varsity coaches revealed that the majority of feedback given by the more successful (defined by win/loss record) coaches was corrective in nature. The results of
this study also suggested that the athletes of the more successful coaches received more feedback than the athletes of less successful coaches. These findings are consistent with the results of a study by Claxton (1988) whose research with nine high school tennis coaches showed that the more successful coaches exhibited less praise than the less successful coaches. Collectively, these studies lend support to Schmidt’s (1991) contention that the overuse of praise, particularly general praise, can be interpreted as nonspecific feedback and can thus dilute its positive effects. Thus, it is suggested that coaches should refrain from overusing praise when it is not deserved and should attempt to incorporate constructive, technical feedback into their interactions with their athletes.

Nonetheless, praise is still an important behavioural element of coaching practice as it is often the second or third most exhibited coaching behaviour overall in various observational studies with successful coaches (e.g., Bloom, Crumpton, & Anderson, 1999; Cushion & Jones, 2001; Lacy & Darst, 1984). Potrac and colleagues (2002) propose that the use of praise can help coaches create positive learning environments that are conducive to the development of positive athlete outcomes, such as motivation and self-efficacy. This is consistent with the work of Smith and Smoll (2002) which found that high frequencies of reinforcement for effort and performance and encouragement following errors are key characteristics of a positive, and moreover, effective approach to coaching. Given these findings, it is evident that effective coaches must be able to successfully negotiate a balance between the use and overuse of positive reinforcement.
Finally, silence/observation is another important aspect of coach-athlete interactions. As might be expected, silence can account for up to 40% of a coach’s total behaviour in training and competition (Smith & Cushion, 2006). Whereas past coaching research has interpreted observation as a passive or off-task behaviour, there is increasing recognition that observation should be conceptualized as a deliberate coaching strategy that can promote positive athlete experiences (Potrac, Jones, & Cushion, 2007; Smith & Cushion, 2006). Cushion and Jones (2001) highlighted the important role of observation in effective coaching as they contend that periods of silence allow coaches to analyze and reflect on appropriate interventions. Moreover, the authors propose that observation can be a crucial component of feedback sequencing, such that any corrective information will not be “diluted by continuous interaction” (Cushion & Jones, 2001, pg. 369). These findings suggest that coaches should learn to effectively incorporate deliberate silence/observation into their coaching practice. As such, developing an understanding of which behaviours should proceed or follow periods of silence/observation is crucial.

**Limitations in Coaching Research**

Collectively, instruction, organization, feedback, and silence represent four key dimensions of coaching behaviour. Indeed, previous research suggests that coaches’ use of instruction, organization, feedback and silence/observation can be associated with positive athlete outcomes, including enhanced performance, team cohesion, and self-confidence (e.g., Smith & Smoll, 2007). However, it is important to acknowledge that
these are only a few of the behaviours that coaches may exhibit in their interactions with their athletes. Moreover, while the existing research offers a wealth of insight into “what coaches do” in regard to coaching behaviour, some limitations must be noted.

First, with respect to studies employing observational methods, coaching behaviours have typically been recorded through the use of frequency counts (e.g., Smith et al., 1983) or duration recording (e.g., Trudel et al., 1996). Thus, although researchers collected data on how often particular coaching behaviours occur, there is limited information on the dynamic structure of these behaviours (e.g., sequences, and variability). The exploration of not only what behaviours a coach exhibits, but also how these behaviours are enacted over time may yield new insight into the structural and temporal elements that comprise coach-athlete interactions.

A second limitation of the coaching literature is that few studies have contextualized their results according to the age or competitive level of the athletes. Recent theoretical research suggests that in order to gain a greater understanding of how coaches can effectively facilitate positive athlete outcomes, it is critical to examine the context in which coaching occurs. Indeed, Côté et al. (2007) propose that coaching can be classified across 4 distinct coaching contexts: (a) participation coaches for children, (b) participation coaches for adolescents, (c) performance coaches for young adolescents, and (d) performance coaches for older adolescents and adults. Participation coaching is characterized by a setting in which competition is not emphasized and in which participants are less intensively engaged in sport. The aim of coaches in this context is to
promote enjoyment and health-related outcomes among their participants (Côté & Gilbert, 2009). Conversely, performance coaching is characterized by a commitment to competition and athletic excellence. In this context, coaches provide athletes with specific, planned programs that are designed to enhance performance variables. By drawing upon the examples above, it is evident that different coaching contexts have different athlete needs and considerations. As such, the methods by which coaches can promote positive athlete outcomes may differ according to the specific coaching context (Lyle, 2002). There is thus a clear need to explore the influence of the coaching context on the coaching process and to investigate how coaches actually go about promoting positive sport experiences with athletes of various ages and competitive levels.

Finally, the majority of previous studies have been conducted with a unidirectional flow of influence (Kahan, 1999; Horn, 2008). That is, studies investigated the influence of coaches’ behaviours on athlete experiences without accounting for how the athletes’ behaviours may in turn influence coaches’ behaviours and subsequently, athlete outcomes. This line of research has therefore evaluated the impact of coach-athlete interactions on athlete development based on the perspective of only one member of the relationship. This is a particularly important limitation to acknowledge as recent theoretical work suggests that coaching can be conceptualized as a complex, reciprocally-influential process based on systems of social interaction (Bowes & Jones, 2006; Cushion, Armour, & Jones, 2006; Jones & Wallace, 2005). As such, both the coach and the athlete have a significant effect on the other and on the way in which their
relationship progresses (Smith et al., 1979). Research that neglects the complex and reciprocal nature of coach-athlete interactions by solely considering the perceptions of the coach thus provides us with an incomplete picture of the role of coach-athlete interactions in youth development. The lack of research on athlete behaviours is further illustrated by the fact that only one study to date (Erickson, Côté, Hollenstein, & Deakin, in press) has incorporated an observational instrument that captures both coach and athlete behaviour within the sport context. While a number of studies in the physical education setting have assessed both student and teacher behaviours, student behavioural categories are often not directly related to interactions with the teacher (e.g., student is off task) or are associated with student’s active learning time (e.g., Behets, 1997; Hastie, 1994). Thus, there is a clear need for research investigating youth’s interactive behaviours (e.g., discussions with coaches or peers) and their relation to personal and performance outcomes.

**Dynamic Systems and the State Space Grid Method**

In an effort to address these limitations, the dynamic systems perspective is proposed as an effective theoretical framework for studying coach-athlete interactions. A dynamic system is composed of the reciprocal interaction of individual components which influence and are influenced by each other to produce the functioning of the entire system (Lewis, 2000). In this case, the system is defined as the coach-athlete dyad, and the coach and the athlete are the individual components. Dynamic systems theory provides a framework for understanding how a coach-athlete dyad changes over time,
both moment to moment and longitudinally. Indeed, the goal of dynamic systems oriented research is to describe how patterns of interactions emerge, change, and stabilize through a system’s own self-organization processes (Granic & Hollenstein, 2003; Lewis, 2000).

Theoretically, any complex system has a broad range of possible behaviour patterns within which it can function (Hollenstein, 2007). In dynamic systems terms, this range is known as the state space. However, in reality, every system tends to stabilize within a fairly limited range of preferred behaviours or states (Granic & Hollenstein, 2003). Referred to as attractors, these stable patterns represent states that draw the system away from other possible states (Lewis, Lamey, & Douglas, 1999). For example, a dysfunctional coach-athlete dyad might often function in a mutually negative state and might therefore have difficulty maintaining interactions outside this range, such as in a mutually positive state. The strength of attractors can vary; the stronger the attractor, the more likely it is for coach-athlete dyad to frequently exhibit that particular behavioural state and to exhibit that behaviour for longer durations of time (Granic & Patterson, 2006). In contrast to attractors, there are states that rarely or never occur, known as repellors. An example of a repellor in interpersonal dynamics might be mutual negativity within a close and supportive coach-athlete relationship. It is the configuration of attractors and repellors that comprises the state space of the system (Hollenstein, 2007).

A dynamic systems perspective of interpersonal interactions thus draws upon the concepts of attractors and repellors within a state space (Hollenstein, 2007). However,
the empirical evaluation of such concepts using traditional methodologies presents a significant challenge to researchers. In response to this challenge, Lewis and colleagues (Lewis et al., 1999) developed the state space grid (SSG) method. Inspired by dynamic systems principles, the SSG method is a graphical approach designed to account for the reciprocal nature and structure of interactions over time. This technique utilizes observational data to construct a state space grid for the system in question, a grid which represents all of the possible behavioural states within which the system could function.

The system, for example the coach-athlete interaction, is characterized by two or more categorical variables, each representing a dimension of the system. All of the potential behaviours of the coach comprise the x-axis of the grid, while all of the potential behaviours of the athlete comprise the y-axis. Each cell of the grid represents the simultaneous occurrence of both the coach’s and athlete’s behaviour. Any time there is a change in either the coach’s or the athlete’s behaviour, a point is plotted on the grid in the cell representing the new joint behavioural event and a line connecting the two points is drawn. Thus, the SSG represents a sequence of joint behavioural events. By observing the changes in the system’s location within the grid over time, it is possible to record the sequences and patterns of behaviours that occur during the interaction. The ability to chronicle these patterns holds significant potential as our understanding of the behavioural structures of coach-athlete interactions is currently limited.

In order to assess these patterns, practices or competitions are videotaped and are then used to code the coach and athletes’ interactive behaviours. To this end, the video is
viewed and the variables of interest, in this case coach and athlete behaviour, are recorded. This recording is completed continuously using duration-based coding (noting the start time, duration, and stop time of both the coach and athlete’s behaviour). Once all of the behaviours of the coach and the athletes are coded, the data are used to construct specific SSG’s (e.g., for the interactions between the coach and athlete A, etc.) and measures of the interactions are calculated using GridWare software (Version 1.1; Lamey, Hollenstein, Lewis, & Granic, 2004).

This technique allows researchers to investigate whether coach-athlete interactions are comprised of a specific set of behaviours or if their behavioural patterns are relatively variable. Researchers can also track how long the coach-athlete interaction stays in certain areas of the SSG over others and how quickly the behavioural patterns return or stabilize in particular areas. In doing so, researchers can examine the relative occurrence and strength of attractors and the variability within the system (Granic & Hollenstein, 2003). Furthermore, the occurrence and strength of attractors within the coach-athlete interaction can be derived quantitatively from SSG analysis and can subsequently be tested statistically for changes in real time or compared between athletes (Hollenstein, 2007). These attractor analyses can be used to illustrate how the coach-athlete dyad’s patterns of interaction emerge and stabilize over time.

The utility of this methodological approach to the study of coach-athlete interactions in youth sport is supported by a recent study by Erickson and colleagues (in press), which successfully incorporated the SSG method into their comparison of the
coach-athlete interactions of two teams producing different performance outcomes and athlete experiences. Both teams (two head coaches and 17 athletes) were video recorded and observed over multiple training sessions and the behaviours of the coaches and athletes were subsequently coded. Measures of coach-athlete interaction content and structure were derived and compared between the two teams using SSG methodology. Results indicated that there were significant differences between the two teams on measures related to interaction variability, behavioural content patterns, and sequences of coaching behaviours. More specifically, the more successful team, as identified through both performance outcomes and athletes’ experiences, was characterized by more patterned, less variable interactions between the coach and her athletes. This general pattern of coach-athlete interactions consisted of more individualized technical feedback and positive reinforcement and significantly less use of negative feedback. In addition, the sequencing of coach behaviours within this successful sport environment was more patterned and placed heavy emphasis on the pairing of corrective technical feedback and positive reinforcement. Alternatively, the less successful team was characterized by more variable coach-athlete interactions and the coach spent significantly more time providing organizational instructions and negative feedback. Finally, the coach of the less successful team spent significantly more time being disengaged from the practice activities of her athletes.

The findings of this study suggest that the characteristics of coach-athlete interactions, with respect to the degree of variability of the interactions, the behavioural
content patterns contained within them, and the sequencing coach-athlete interactive behaviours, may influence the performance outcomes and sport experiences of participants in youth sport. In doing so, this study provides valuable insight into how previously unquantifiable qualities of coach-athlete interactions may contribute to positive sport experiences. The Erickson et al. (in press) study also highlights how the SSG method can be effectively applied to field-based, youth sport research. As such, the work of Erickson and colleagues (in press) provides a valuable foundation for future studies wishing to integrate this novel approach into the exploration of the influence of sport participation on youth development.

**Coaching in Disability Sport**

Finally, before considering how the present study incorporates SSG methodology into its examination of coach-athlete interactions in the disability sport context, findings from previous research with coaches of athletes with disabilities are first reviewed. While reports and training materials pertaining to the technical instruction of athletes with disabilities exist within the literature (e.g., Dummer & Bare, 2001; Sherrill & Dummer, 2003; Prins & Murata, 2008), very limited research has examined coach-athlete interactions within disability sport. Some of the earliest research efforts on coaches of athletes with disabilities focused on the characteristics of those who coach within the disability sport context, including coaches’ demographics, training backgrounds, and previous sport experiences. For instance, in their survey of 155 coaches, DePauw and Gavron (1991) found that coaches of athletes with disabilities tended to be college
educated persons between 26-40 years of age, with prior sport and coaching experience. Commonly cited reasons for coaching athletes with disabilities were previous experience as a coach and volunteerism. A small number of participants reported becoming a coach after competing as an athlete with disability themselves or because a family member was active in disability sport. In addition to being one of the first studies to solely focus on coaches of athletes of disabilities, the findings of this study greatly enhanced our understanding of the profiles of coaches who are involved in disability sport.

More recently, Cregan and colleagues (2007) examined the career evolution and knowledge of coaches of elite level swimmers with a disability. They interviewed six coaches through unstructured, open-ended interviews using an interview guide based on Côté, Salmela, Trudel, Baria and Russell’s (1995) Coaching Model. Results revealed that coaches faced some unique challenges in their coaching experience, including having to learn about accessibility (accessible hotels, facilities, and transportation), different types of disabilities, and how to communicate with the athletes’ support workers or caregivers where applicable (Cregan et al., 2007). The findings also indicated that coaches emphasized the significance of building autonomy in their athletes and being creative when adapting training programs to suit each athlete’s unique needs. In addition, coaches highlighted the degree of equality in their relationships with their athletes and commented that both the coach and athlete had equal input in the coaching process. According to Cregan and colleagues (2007), the importance of athlete input was underscored by the fact that the athletes understood their disability better than the coach. Finally, coaches
stressed that individuals should be considered athletes first and disabled second, and thus these elite level swimmers should indeed be treated and coached as elite athletes. The results of this study therefore provide valuable insight regarding both the challenges faced by coaches within the disability sport environment and the various factors influencing the development of positive coach-athlete relationships.

Whereas the work by Cregan and colleagues (2007) shed some light on coaches’ perceptions of coach-athlete relationships in disability sport, a recent study by Banack Sabiston, and Bloom (in press) focused on athletes’ perceptions of the influence of coach behaviour on the athlete outcomes. More specifically, Banack and colleagues (in press) explored the relationship between adult Paralympic athletes’ perceptions of autonomy-supportive coach behaviour, basic psychological needs and their intrinsic motivation to know, accomplish, and experience stimulation. One hundred and thirteen Canadian Paralympic athletes completed questionnaires that assessed coach autonomy support, perceptions of autonomy, competence, and relatedness, and the three forms of intrinsic motivation. Results revealed that perceived coach autonomy support was a significant predictor of athletes’ perceptions of autonomy and relatedness. Perceived competence was a significant predictor of all three forms of intrinsic motivation, whereas perceived autonomy was a significant predictor of intrinsic motivation to accomplish and experience stimulation. The results of this study help to illustrate the significant relationship between coach behaviour and athlete motivation in disability sport and serve as an important foundation for future research in this area. However, this research
centres on the effects of coach behaviour within an elite sport context and thus, the impact of coach behaviour on the development of young athletes with disabilities has yet to be explored.

**Purpose of the Study**

The present study therefore intends to build upon and extend the findings of Banack and colleagues (in press) and Erickson and colleagues (in press) by examining the coach-athlete interactions that occur in a highly successful sport program for athletes with disabilities and their able bodied siblings. Due to the exploratory nature of this investigation, no specific hypotheses were formulated. Rather, this study aims to answer the following research questions regarding the nature of the dyadic coach-athlete interactions occurring within this successful program: (a) how variable are these dyadic interactions? (b) to what behavioural patterns do these dyads tend to be drawn? (c) are these interactions characterized by particular behavioural sequences? and (d) are the coach-athlete interactive behavioural patterns and sport experiences consistent across all athletes (e.g., recreational vs. competitive, and able bodied siblings vs. athletes with disabilities) or are they unique to each dyadic pair?
Chapter 3

Methods

Participants

The program in this study was a competitive swim team for athletes with disabilities and their able-bodied siblings, located in southern Ontario, Canada. This particular program was selected as it is the largest programs of its kind in Canada (Shevchenko, 2008). Furthermore, this program was selected for both its record of elite performance and its reputation as a sport environment that is conducive to positive development (Shevchenko, 2008). Participants included the female head coach \( n = 1 \) and athletes \( n = 24 \) from this swim program. Participants were both male \( n = 11 \) and female \( n = 13 \), between 8-19 years of age \( M = 13.73, SD = 3.1 \), and averaged 4.45 years of swimming experience.

Participants represented a wide range of disabilities as determined by their sport classification categories (Dummer, 1999; Sherill, 1997). Swimmers with a physical disability are classified based on several factors (e.g., muscle strength, movement coordination, joint range of movement, and limb length). Within this classification system, the lower the number of the class, the greater the functional impairment (e.g., class 1 represents a severe disability and class 10 represents a less severe disability). Class 14 represents swimmers with an intellectual disability and class 15 represents swimmers with a hearing impairment. Participants from this particular program ranged from most severe to least severe as follows: classes 4 \( n = 1 \), 5 \( n = 1 \), 6 \( n = 3 \), 8 \( n = 2 \), 9 \( n =
1), 10 (n = 3), 14 (n =1) and 15 (n= 1). Eleven of the participants were the able-bodied siblings of the athletes with disabilities.

Participants also represented a wide range of competitive levels. Twelve of the participants (2 athletes with disabilities and 10 able-bodied siblings) were recreational athletes who competed at the local or age group level. Twelve of the athletes (11 athletes with disabilities and 1 able-bodied sibling) were competitive athletes who competed at the regional (n = 4), provincial (n = 4), national (n = 2), and international (n=2) levels (see Appendix E, Table 7 for detailed participant table).

Description of the program.

A unique aspect of this particular program was that it allowed its participants to choose to focus on either recreational participation or elite performance while working with the same coach. Athletes who chose the recreational stream practiced two times a week, while athletes in the competitive stream practiced between five to seven times a week. The smaller practices designed for the competitive athletes had between 6-9 athletes in attendance, whereas the larger practices that were open to all athletes had between 15-19 athletes in attendance.

Procedure

The head coach, the athletes, and the athletes’ parents were required to provide written consent prior to participation. An information session was then provided for the parents and athletes to further explain the nature of the project, as well as answer any questions before the beginning of the data collection process. Eight practices were
videotaped, with the coach wearing an omni-directional wireless microphone to capture her own and the athletes’ verbalizations. Two trial recordings were used to acclimatize the coaches and athletes to the presence of the researcher and to the recording process in an effort to minimize reactivity (Smith et al., 1977).

The videos for each of the practices were used to code coach and athlete interactive behaviours. Two 30-minute segments were selected for analysis from each of the eight practices, resulting in a total of eight hours of observation time spread over 16 video segments to be coded. The first 60 minutes from each practice session was selected to be coded since they contained the greatest density of analyzable coach-athlete interactions. These 60 minutes were then split into two 30-minute segments. The variables of interest (coach behaviour and athlete behaviour), were recorded continuously for each participant using real time duration-based coding. Each behavioural variable was coded separately.

Finally, at the beginning of the last recorded practice, athletes were asked to complete the Youth Experience Survey for Sport (YES-S; MacDonald, Deakin, Eys, & Côté, 2009) and the Basic Need Satisfaction in Relationships Scale (BNSRS; LaGuardia, Ryan, Couchman, & Deci, 2000), keeping in mind their experiences within this sport program. These measures were included to assess athletes’ perceptions of their experiences within this sport environment. The time needed for participants to complete the questionnaires was approximately 30 to 40 minutes. Any questions that were raised during this phase of data collection were addressed by the primary researcher. Although
efforts were made to ensure that all athletes completed the questionnaire, one athlete was unable to complete the questionnaire due to limitations in their communication abilities.

**Measures**

**Youth Experience Survey for Sport.**

Athletes’ personal development was assessed using the Youth Experience Survey for Sport (YES-S; MacDonald et al., 2009). The YES-S is a 37-item, self-report questionnaire that measures experiences of youth on the five dimensions of personal and social skills (14 items; i.e., “I became better at giving feedback”), cognitive skills (5 items; i.e., “This activity increased my desire to stay in school”), goal setting (4 items; i.e., “I set goals for myself in this activity”), initiative (4 items; i.e., “I put all my energy into this activity”), and negative experiences (10 items; i.e., “I got stuck doing more than my fair share”). Athletes reflected on their current sport involvement and responded to each statement using a 4-point Likert-type scale anchored by 1 (Not at all) and 4 (Yes definitely). Reliability analyses of the subscales in the previous research produced Cronbach alpha values between .79 and .90 (MacDonald et al., 2009). This measure has been successfully used with youth sport participants ranging in age from 9-19 years (MacDonald et al., 2009; see Appendix C).

**Basic Need Satisfaction in Relationships Scale.**

The second measure that was used was an adapted version of the Basic Need Satisfaction in Relationships Scale (BNSRS; LaGuardia et al., 2000). This instrument consists of 9 items and assesses need satisfaction in athletes’ relationships with their
coach. Athletes responded to each item on a 7-point scale with anchors of 1 (Not at all true) and 7 (Very true). Scores on this measure reflected the extent to which athletes’ perceive their basic needs for autonomy (3 items; i.e., “When I am with my coach, I feel free to be who I am”), competence (3 items; i.e., “When I am with my coach, I feel very capable and effective), and relatedness (3 items; i.e., “When I am with my coach, I feel loved and cared about) are satisfied in their interactions with their coach. Reliability analysis in previous research has produced Cronbach alpha values between .83-.84 for the three subscales of this measure (Coatsworth & Conroy, 2009). This measure has previously been used with youth sport participants ranging in age between 10-18 years (see Appendix C).

**Coach-Athlete Interaction Measure.**

Coach and athlete behaviours were coded with a contextually based coding system. This system was developed in accordance with Brewer and Jones’ (2002) recommendations for the development of systematic observation instruments in sport psychology. Brewer and Jones (2002) propose that any systematic coding system must be designed to suit the sporting context in which it will be used in order to produce valid data, thus precluding the use of previous observation instruments without modification. They suggest that the process of a contextually valid observation instrument development should include amending an existing instrument, establishing context-specific validity, extensive observer training, and testing of observer reliability. The newly developed PARA-Coach Athlete Interaction Observation System (PARA-CAICS; Appendix D) is
intended for observation of competitive swim practices in a program that includes athletes with disabilities. The PARA-CAICS provides an exhaustive categorization of coach and athlete behaviour content. All categories within each of the behavioural dimensions are mutually exclusive. The selection of behavioural categories within each dimension is discussed below; for detailed descriptions of each category refer to the attached coding manual (Appendix D).

**Coach and athlete behaviour content.**

The process of developing the PARA-CAICS began with the modification of the Coach-Athlete Interaction Coding System (CAICS; Erickson et al., in press) to capture both the coach’s and athletes’ behavioural content. The CAICS was created for use in a youth synchronized swimming context and allows for the continuous measurement of coach and athlete behaviour content, affect, and context. The CAICS, originally adapted from the CBAS, consists of 12 behavioural categories that are used to classify coach behaviour content: (1) positive reinforcement, (2) corrective encouragement, (3) future encouragement, (4) corrective technical, (5) future technical, (6) organization, (7) observation, (8) general communication, (9) not engaged, (10) keeping control, (11) error technical, and (12) negative evaluation. The CAICS is also comprised of 8 behavioural categories that are used to code athlete behaviour: (1) technical talking, (2) clarification, (3) acknowledgement, (4) general talking, (5) engaged, (6) disengaged, and (7) not codable.
One of the concerns that necessitated the modification of the CAICS for use in the current study was the fact that the CAICS was initially developed in a female youth synchronized swimming context. As such, the categories were not completely representative of the coaching behaviours occurring in a co-ed, competitive swimming context designed for both athletes with disabilities and their able-bodied siblings. The first step involved in modifying the CAICS to better suit the current study was the observation of several practice sessions and the subsequent development of the behavioural priorities that would guide the coding system. During this step, three fundamental behavioural categories were proposed: (a) behaviours that were unique to the disability sport context, (b) new instructional behaviours, and (c) behaviours that were conducive to creating a positive environment.

Based on these behavioural priorities, a number of categories were added to the CAICS coding system. First, with regards to behaviours that were unique to the disability sport environment, the category of physical assistance was added to the coach content categories in order to account for coach behaviours that involved helping the athletes into or out of the pool or helping the athletes with their equipment. Examples of these types of behaviours include lifting an athlete out of their wheelchair and into the pool and helping athletes onto the starting blocks. In addition, one category of athlete behaviour content (helping others) was created to account for times when the athletes physically helped their teammates.
Second, some of the instructional categories of the CAICS were renamed to better reflect this particular swimming context. More specifically, (a) the categories of positive reinforcement and corrective encouragement were collapsed into one category and (b) the categories of corrective technical and future technical were renamed as technical instruction with modelling and technical instruction. The technical instruction category represents coach behaviours when the coach is verbally describing to athletes how to do a skill whereas the category of technical instruction with modelling reflects occurrences when the coach physically demonstrates the performance of the skill or technique or the coach physically manipulates the athlete to demonstrate technique. Two other categories of instructional behaviours (cues and coach-initiated athlete input) were also added to the coding system. This conceptualization of instructional behaviours was validated in the coding of pilot videos and is consistent with a number of existing observation systems including the Arizona State University Observation System (Lacy & Darst, 1984), and the Coaching Behaviour Recording Form (Tharp & Gallimore, 1976).

Finally, two coach content categories were added (inter/intra personal instruction and humour) to account for behaviours that may be conducive to creating a positive environment. Inter/intra personal instruction represents the coach’s deliberate attempts to instill attitudes or skills that may contribute to personal development, including setting an example (leadership), teaching responsibility, teaching athletes how to interact positively with one another and encouraging athletes to provide support, assistance, and feedback to their teammates. Humour was also included in the coding system to reflect the coach’s
deliberate attempt to include humour in the practice and includes both the coach using humour herself and encouraging the athletes to use humour. One category was also added to the athlete content dimension (positive response) to account for times when the athletes exhibited a positive reaction to the coach’s use of humour.

Overall, these modifications to the CAICS resulted in a total of 16 coach behaviour content categories: (1) humour, (2) positive reinforcement/encouragement (3) coach-initiated athlete input, (4) technical instruction with modelling, (5) technical instruction, (6) cues, (7) inter/intra personal instruction, (8) organization, (9) observation, (10) general communication, (11) physical assistance, (12) keeping control, (13) error technical, (14) negative evaluation, (15) not engaged and (16) uncodable. The athletes’ behavioural content consisted of ten categories mostly derived from the CAICS: (1) helping others, (2) positive response, (3) technical talking, (4) clarification, (5) acknowledgement, (6) general communication with an athlete, (7) general communication with the coach, (8) engaged, (9) disengaged, and (10) not codable.

**Contextual validity.**

In keeping with Brewer and Jones’ (2002) recommendations, the resulting coding instrument was discussed with both the head coach and volunteer assistant coaches of the swim program in order to gauge the face validity of the selected categories. Furthermore, the coding instrument was pilot tested with sample videos of competitive swimming practices as a means of determining its validity in the competitive swimming context and
its ability to capture, categorize, and differentiate the coach and athlete behaviours that were relevant to the research questions of this study (Brewer & Jones, 2002).

**Coder training and reliability.**

For the purposes of establishing inter-coder reliability, frequency agreement referred to the total number of occurrences that both coders activated the same specific behavioural category within a three second window. The primary researcher and an independent coder were trained to meet a minimum agreement of 75% on frequency for two 10-minute video segments before being allowed to code full video segments that were used in study analysis (Erickson et al., in press; Hollenstein, Granic, Stoolmiller, & Snyder, 2004). Once both coders met the required reliability standard, they began coding the segments designated for analysis. Two full 30-minute segments were randomly selected to be coded by both coders, after which the coded data for these segments was compared in a further inter-rater reliability check. Again, percentage agreement for frequency of behaviours was calculated, with both meeting adequate reliability (freq. % agreement = 76%; kappa= .75 and 77%; kappa= .76, respectively).

**Data Analysis**

Individual coach-athlete dyads were the primary unit of analysis, comprised of the coach and each individual athlete. As such, 24 coach-athlete dyads were analyzed in total. An example of the standard state space grid on which each coach-athlete dyadic interaction was tracked is presented in Figure 1. Each cell in the grid represents a distinct interactive state defined by the mutual occurrence of specific coach and athlete
behaviours (the x and y-coordinates). Measures of coach-athlete interaction structures and dynamics were calculated using GridWare software (Version 1.1; Lamey et al., 2004), which is designed for the SSG method. Measures were calculated for three concepts: (a) variability, (b) attractor states, and (c) transitions and sequences. These measures were derived from SSG’s constructed for each coach-athlete dyadic pair (i.e., coach and athlete A, coach and athlete B, etc).

Dyad measures as dependent variables were grouped together to examine the team as a whole, and were subsequently grouped by competitive level and disability status for comparison purposes. Measures were also compared across three observed practices. The three time points represented the first, middle, and last practice that each athlete attended. For those athletes who participated in an even number of practices, the practice with the higher attendance rate was selected as the middle practice. Differences between groups were tested statistically with 2 (group) x 3 (time) repeated measure ANOVAs, using Bonferonni-corrected alpha values for multiple comparisons within each conceptual grouping.
Variability.

The variability of the coach-athlete interactions was assessed by two whole grid parameters. The first parameter was the number of different cells (joint behavioural events) visited over the course of the interaction, with higher numbers of cells visited indicating a more variable pattern of behaviour. In the example in Figure 1, the coach-athlete dyad visited 42 of the 200 cells in the grid. The second parameter assessed variability by measuring the number of transitions between cells, with more transitions...
signifying greater variability. The transition parameter provided additional and different information from the number of cells visited, since an interaction may be characterized by occupying a low number of cells, but having a high number of transitions between those few specific cells. To illustrate this, the dyad depicted in Figure 1 made 320 transitions between the 42 cells visited over the course of the interaction. Variability was assessed for both the team as a whole and compared between different groups within the team (competitive vs. recreational, and able bodied vs. athletes with disabilities).

**Attractor states.**

In contrast to variability, which was assessed by whole grid measures, attractors were identified by computing and comparing parameters for each cell of the SSG. Attractors, areas within the state space to which the interaction appeared to be drawn, were identified through two parameters, which were averaged across athletes and practices. First, attractors were identified by how much time was spent in a particular region of the grid, with longer times indicating a stronger attraction. This is measured by the mean total duration (in seconds) spent in each cell. The second parameter was duration per visit, with stronger attractor cells reflected by longer durations per visit. Attractors were identified for the team overall and were then compared between the different groups with regards to the differences or similarities in the cells (or groups of cells) that exert the most pull on the interaction.
Transitions and sequences.

Sequences of coach behaviour were analyzed using lagged phase plots, in which coach behaviour at any given time (t) was plotted along the x-axis and the subsequent coach behaviour (t+1) was plotted along the y axis. Each cell in the SSG thus represented the transition from one coach behaviour to another, with more events in a particular cell indicating a more frequently occurring transition. The probability for individual transitions was calculated by dividing the number of transitions from an initial behaviour to a specific subsequent behaviour by the number of total transitions from the initial behaviour to all subsequent behaviours. Thus, transitional probability = # of A-B transitions / # of total transitions from A. These frequently occurring transitions represented common coach behaviour sequences.
Chapter 4

Results

Means and standard deviation values for each subscale of the YES-S and BNSRS with corresponding reliability coefficients are presented in Table 1. All subscales demonstrated good reliability with Cronbach alpha values all greater than 0.6. Two of the subscales, the Negative Experiences subscale from the YES-S and the Autonomy subscale from the BNSRS, each had one item removed in order to reach an alpha value of 0.6. Correlations between the subscales showed low to high relationships with Pearson coefficients between .08 and .77 (Appendix E, Table 8).

Mean values demonstrate that the athletes’ experiences within the program were quite positive. The results also indicate that the athletes’ felt that their need for autonomy, competence, and relatedness was satisfied by their relationships with the head coach of the program. Using a corrected $p$ value of 0.003, no significant differences emerged based on the athletes’ competitive level (Appendix E, Table 9). Further, there were no significant differences between the responses of athletes with disabilities and able bodied athletes (i.e., disability status; Appendix E, Table 10).
Table 1. Descriptive statistics of the YES-S and the BNSRS.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Youth Experience Survey for Sport</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal and social skills</td>
<td>3.22</td>
<td>.44</td>
<td>.80</td>
</tr>
<tr>
<td>Cognitive skills</td>
<td>2.24</td>
<td>.72</td>
<td>.70</td>
</tr>
<tr>
<td>Goal setting</td>
<td>3.25</td>
<td>.65</td>
<td>.70</td>
</tr>
<tr>
<td>Initiative</td>
<td>3.67</td>
<td>.48</td>
<td>.81</td>
</tr>
<tr>
<td>Negative experiences</td>
<td>1.30</td>
<td>.27</td>
<td>.62</td>
</tr>
<tr>
<td><strong>Basic Need Satisfaction in Relationship Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>5.94</td>
<td>.90</td>
<td>.73</td>
</tr>
<tr>
<td>Competence</td>
<td>6.31</td>
<td>.96</td>
<td>.72</td>
</tr>
<tr>
<td>Relatedness</td>
<td>5.85</td>
<td>.87</td>
<td>.65</td>
</tr>
</tbody>
</table>

*a* Scale anchors between 1-4  
*b* Scale anchors between 1-7

**Coach and Athlete Behavioural Content: State Space Grid Analysis**

The analyses presented below focus on both coach and athlete behaviour content categories. Results of coach-athlete dyadic interaction analyses are presented first with regards to the overall variability of the interactions across the whole grid, followed by measures of specific attractor regions of the grid. Results are discussed in relation to both the team as whole and the different groups within the team. Finally, common sequences of coach behaviours are presented.
Variability

Overall, the coach-athlete interactions of this sport program were structured in nature. On average, the dyads visited 31.43 cells ($SD = 8.93$) of the possible 200 cells of the SSG (averaged across athletes and practice sessions). In addition, the dyads made an average of 238 transitions ($SD = 34.58$) during the course of their interactions. See Figure 1 for an example trajectory of one dyadic coach-athlete interaction summed across training sessions. In this example, the dyad visited an average of 35.5 cells over the course of a practice session and made an average of 260 transitions between specific cells.

Four separate 2 (group) x 3 (time) repeated measures ANOVAs were conducted to compare the variability of the coach-athlete interactions between competitive and recreational athletes and between athletes with disabilities and able-bodied athletes. The dependent variables for these analyses were the number of cells visited and the number of transitions between cells. Results revealed that there were no significant differences in the mean number of cells visited based on competitive level or disability status. However, using a corrected $p$ value of 0.0125, there was a main effect for competitive level on the mean number of transitions per practice session. Specifically, the mean number of transitions between cells was significantly higher for interactions occurring between the coach and competitive athletes ($M = 250.12, SD = 37.44$) than those between the coach and recreational athletes ($M = 233.92, SD = 32.76; F(1,2) = 8.24, p = .009, \eta^2_p = .273$).
Figure 2. SSG for one coach-athlete dyad displaying summed trajectories across practices.
Attractor States

Athletes engaged in practice activities.

The athletes spent the vast majority of their time engaged in practice activities (82.8% of the practice time, represented by the set of horizontal transitions across the middle of the grid in Figure 1), not directly interacting with the coach or their peers. As such, patterns of coach behaviours while the athletes were engaged will be presented first. Table 2 displays the mean duration and mean number of visits per practice session for coach behaviour while the athletes were engaged. Of the nearly 1500 seconds that the athletes were engaged, the coach spent the majority of this time silently observing the athletes (48.4%), followed by providing organizational instruction targeted towards both individual athletes (9.6%) and the team as a whole (6.7%) and then by providing individualized technical instruction both with (6.6%) and without modelling (6.2%). The coach displayed higher usage of positive coaching behaviours, such as positive reinforcement (2.4%) in comparison to negative coaching behaviours, such as keeping control (0.2%). The coach’s use of positive coaching behaviours is reinforced by the fact that individualized positive reinforcement was the fifth most frequently used coaching behaviour. Finally, the coach of this program spent more practice time exhibiting behaviours that were directed towards individual athletes, as opposed to the team as a whole (see Table 3). This pattern was evident for several behavioural categories, including humour, positive reinforcement, organization, general communication and technical instruction with and without modelling.
Table 2. Mean duration (seconds) and mean number of visits per practice session for coach behaviours while athletes were engaged in practice activities.

<table>
<thead>
<tr>
<th>Behaviour Type</th>
<th>Duration M</th>
<th>Size %</th>
<th>Frequency M</th>
<th>Size %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humour team</td>
<td>8.09</td>
<td>0.55</td>
<td>1.61</td>
<td>0.85</td>
</tr>
<tr>
<td>Humour athlete</td>
<td>24.75</td>
<td>1.67</td>
<td>6.71</td>
<td>3.56</td>
</tr>
<tr>
<td>Positive reinforcement team</td>
<td>4.04</td>
<td>0.27</td>
<td>1.74</td>
<td>0.92</td>
</tr>
<tr>
<td>Positive reinforcement athlete</td>
<td>32.23</td>
<td>2.17</td>
<td>14.52</td>
<td>7.70</td>
</tr>
<tr>
<td>Coach-initiated athlete input</td>
<td>48.39</td>
<td>3.26</td>
<td>9.82</td>
<td>5.21</td>
</tr>
<tr>
<td>Technical instruction team</td>
<td>25.53</td>
<td>1.72</td>
<td>2.36</td>
<td>1.25</td>
</tr>
<tr>
<td>Technical instruction athlete</td>
<td>92.67</td>
<td>6.24</td>
<td>8.58</td>
<td>4.55</td>
</tr>
<tr>
<td>Technical instruction with modelling team</td>
<td>30.88</td>
<td>2.08</td>
<td>4.23</td>
<td>2.24</td>
</tr>
<tr>
<td>Technical instruction with modelling athlete</td>
<td>97.39</td>
<td>6.56</td>
<td>15.88</td>
<td>8.42</td>
</tr>
<tr>
<td>Cues athlete</td>
<td>7.66</td>
<td>0.52</td>
<td>3.78</td>
<td>2.00</td>
</tr>
<tr>
<td>Personal instruction</td>
<td>17.46</td>
<td>1.18</td>
<td>2.13</td>
<td>1.13</td>
</tr>
<tr>
<td>Organization team</td>
<td>99.06</td>
<td>6.68</td>
<td>18.77</td>
<td>9.95</td>
</tr>
<tr>
<td>Organization athlete</td>
<td>142.17</td>
<td>9.58</td>
<td>28.71</td>
<td>15.22</td>
</tr>
<tr>
<td>Observation</td>
<td>718.11</td>
<td>48.39</td>
<td>54.21</td>
<td>28.74</td>
</tr>
<tr>
<td>General communication team</td>
<td>4.15</td>
<td>0.28</td>
<td>0.57</td>
<td>0.30</td>
</tr>
<tr>
<td>General communication athlete</td>
<td>83.43</td>
<td>5.62</td>
<td>10.25</td>
<td>5.44</td>
</tr>
<tr>
<td>Physical assistance</td>
<td>14.71</td>
<td>0.99</td>
<td>2.54</td>
<td>1.35</td>
</tr>
<tr>
<td>Negative behaviours</td>
<td>3.48</td>
<td>0.23</td>
<td>0.99</td>
<td>0.52</td>
</tr>
<tr>
<td>Not engaged</td>
<td>29.15</td>
<td>1.96</td>
<td>1.16</td>
<td>0.62</td>
</tr>
<tr>
<td>Uncodable</td>
<td>0.60</td>
<td>0.04</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Total</td>
<td>1489.95</td>
<td>100.00</td>
<td>188.59</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Note. Percentages were calculated by dividing the mean duration (seconds) or mean number of visits by the total time or total number of visits that occurred while the athletes were engaged.
Table 3. Percentage of practice time of coach behaviours while the athletes were engaged in practice activities.

<table>
<thead>
<tr>
<th>% of Practice Time</th>
<th>Behaviours directed to:</th>
<th>Not directed:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Team</td>
<td>Individuals</td>
</tr>
<tr>
<td></td>
<td>13.77</td>
<td>37.79</td>
</tr>
</tbody>
</table>

The coach’s behaviours were compared between competitive and recreational athletes and between able bodied athletes and athletes with disabilities. Given that the coach spent more practice time displaying behaviours that were targeted towards individual athletes, in comparison to the whole team, these attractor analyses focused on individualized coaching behaviours. The $p$ value for attractor state comparisons was set at .005. Ten separate 2 (group) x 3 (time) repeated measure ANOVAs were conducted to analyze the five most frequently occurring individualized coaching behaviours (organization, technical instruction with modelling, positive reinforcement, general communication, and coach-initiated athlete input). When comparing competitive and recreational athletes, the ANOVAs revealed a significant main effect for group for positive reinforcement and technical instruction with modelling. Results indicated that the coach spent a significantly greater duration of time providing individualized positive reinforcement to the competitive athletes ($M = 37.20$, $SD = 19.36$) relative to the recreational athletes ($M = 25.79$, $SD = 21.54$; $F(1, 2) = 24.29$, $p < .001$, $\eta_p^2 = .525$). Furthermore, the competitive athletes ($M = 113.98$, $SD = 79.03$) received significantly higher levels of technical instruction with modelling compared to the recreational athletes.
When comparing the coach’s behaviour relative to the athletes’ disability status, there was no main group effect (Appendix E, Table 11). Additionally, there were no significant differences for the measure of duration per visit for any of the behavioural categories based on the athletes’ competitive level or disability status.

When comparing the content of the coach’s behaviours between competitive and recreational athletes, significant main effects for time were found for technical instruction with modelling, positive reinforcement, general communication, and coach-initiated athlete input. The main effect for time for organization did not reach statistical significance (see Table 4). These time effects indicate that there was significant variation in the duration for which these behaviours were exhibited between practices 1, 2, and 3. These main effects for time were also evident when comparing coaching behaviours between athletes with disabilities and able-bodied athletes (see Table 5).

Table 4. ANOVA results table when comparing the time effects on the content of coach behaviours between competitive and recreational athletes.

<table>
<thead>
<tr>
<th>Coach Behaviour</th>
<th>df</th>
<th>F</th>
<th>(\eta^2_p)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>(1,2)</td>
<td>4.75</td>
<td>.178</td>
<td>.021</td>
</tr>
<tr>
<td>Technical instruction with modelling</td>
<td>(1,2)</td>
<td>9.27</td>
<td>.296</td>
<td>.000*</td>
</tr>
<tr>
<td>Positive reinforcement</td>
<td>(1,2)</td>
<td>7.61</td>
<td>.258</td>
<td>.004*</td>
</tr>
<tr>
<td>General communication</td>
<td>(1,2)</td>
<td>11.07</td>
<td>.335</td>
<td>.001*</td>
</tr>
<tr>
<td>Coach-initiated athlete input</td>
<td>(1,2)</td>
<td>7.26</td>
<td>.248</td>
<td>.002*</td>
</tr>
</tbody>
</table>

*Note.* *Significant at the .005 level.*
Table 5. ANOVA results table when comparing the time effects on the content of coach behaviours between able bodied athletes and athletes with disabilities.

<table>
<thead>
<tr>
<th>Coach Behaviour</th>
<th>df</th>
<th>F</th>
<th>(\eta_p^2)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>(1,2)</td>
<td>4.48</td>
<td>.169</td>
<td>.017</td>
</tr>
<tr>
<td>Technical instruction with modelling</td>
<td>(1,2)</td>
<td>9.87</td>
<td>.310</td>
<td>.000*</td>
</tr>
<tr>
<td>Positive reinforcement</td>
<td>(1,2)</td>
<td>7.54</td>
<td>.255</td>
<td>.004*</td>
</tr>
<tr>
<td>General communication</td>
<td>(1,2)</td>
<td>9.88</td>
<td>.310</td>
<td>.002*</td>
</tr>
<tr>
<td>Coach-initiated athlete input</td>
<td>(1,2)</td>
<td>7.04</td>
<td>.242</td>
<td>.003*</td>
</tr>
</tbody>
</table>

Note. *Significant at the .005 level.

**Athletes’ Interactions.**

As stated above, the athletes spent the majority of their practice time engaged in practice activities \((M = 1483.96 \text{ seconds}, SD = 435.67)\), such as swimming during assigned sets or resting during appropriate rest periods. Other commonly exhibited athlete behaviours included talking with their teammates \((M = 47.94 \text{ seconds}, SD = 90.85)\) and discussion with the coach either about technical, performance related topics \((M = 37.13 \text{ seconds}, SD = 54.04)\) or general, non-sport related topics \((M = 19.68 \text{ seconds}, SD = 69.50)\). Eight separate 2 (group) x 3 (time) repeated measures ANOVAs were conducted to examine the four most commonly exhibited interactive athlete behaviours (technical talking, general talking coach, general talking athlete, and acknowledgment). When comparing the athletes’ behaviours based on competitive level and disability status, the corrected \(p\) value was set at .00625. Results revealed that there were no significant main group effects for either competitive level or disability status. In addition, there were no significant main effects for time.
Transitions and Sequences

The transitions and sequences of coach behaviour were analyzed using a lagged phase plot SSG (coach behaviour plotted against subsequent coach behaviour- same categories on each axis). The cells in the lagged phase plot represent the consecutive pairings of two different coach behaviours, a direct first order transition between behaviours. The lines between the cells thus represent second order transitions linking individual behaviours into longer sequences of three or more behaviours. The probability for individual transitions was calculated by dividing the number of transitions from an initial behaviour to a specific subsequent behaviour by the number of total transitions from the initial behaviour to all subsequent behaviours. Thus, transitional probability = # of A-B transitions / # of total transitions from A. These frequently occurring transitions represented common coach behaviour sequences, with the potential for frequently occurring transitions to be linked into three or more behaviour sequences. Figure 3 presents the lagged phase plot for the coach summed across all practices.
Figure 3. The lagged phase plot SSG’s for the coach summed across all practices, with coach behaviour at a given time on the x-axis and the subsequent coach behaviour (lag) on the y-axis.
The dark cells of the SSG in Figure 3 represent areas of frequently occurring first order transitions. As shown in Table 6, the transitions with the highest frequencies were the transition from the observational category into the organizational categories and the reverse transitions, represented by the dark central portion of the grid. Outside of the organization/observation pairing, the coach often combined observation with subsequent positive reinforcement, technical instruction with modelling, technical cues, or general communication to individual athletes.
Table 6. Mean visits per practice session and transitional probabilities of frequently occurring coach behaviour sequences.

<table>
<thead>
<tr>
<th>Behavioural Pairing</th>
<th>$M$ (visits)</th>
<th>$SD$</th>
<th>Transitional Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organization athlete $\rightarrow$ Observation</td>
<td>16.69</td>
<td>7.75</td>
<td>.49</td>
</tr>
<tr>
<td>Observation $\rightarrow$ Organization athlete</td>
<td>13.75</td>
<td>8.15</td>
<td>.20</td>
</tr>
<tr>
<td>2. Observation $\rightarrow$ Organization team</td>
<td>8.69</td>
<td>5.97</td>
<td>.37</td>
</tr>
<tr>
<td>Organization team $\rightarrow$ Observation</td>
<td>9.63</td>
<td>6.33</td>
<td>.13</td>
</tr>
<tr>
<td>3. Observation $\rightarrow$ Positive reinforcement athlete $\rightarrow$ Observation</td>
<td>8.68</td>
<td>3.24</td>
<td>.12</td>
</tr>
<tr>
<td>Positive reinforcement athlete $\rightarrow$ Observation</td>
<td>8.44</td>
<td>4.18</td>
<td>.39</td>
</tr>
<tr>
<td>4. Observation $\rightarrow$ Technical instruction with modelling athlete</td>
<td>7.06</td>
<td>4.22</td>
<td>.09</td>
</tr>
<tr>
<td>Technical instruction with modelling athlete $\rightarrow$ Observation</td>
<td>5.94</td>
<td>3.53</td>
<td>.23</td>
</tr>
<tr>
<td>5. Observation $\rightarrow$ Cues athlete</td>
<td>5.38</td>
<td>6.49</td>
<td>.07</td>
</tr>
<tr>
<td>Cues athlete $\rightarrow$ Observation</td>
<td>4.94</td>
<td>5.90</td>
<td>.70</td>
</tr>
<tr>
<td>6. Observation $\rightarrow$ General communication athlete $\rightarrow$ Observation</td>
<td>5.38</td>
<td>3.81</td>
<td>.07</td>
</tr>
<tr>
<td>General communication athlete $\rightarrow$ Observation</td>
<td>4.56</td>
<td>3.79</td>
<td>.31</td>
</tr>
<tr>
<td>7. Positive reinforcement athlete $\rightarrow$ Technical instruction with modelling athlete</td>
<td>3.81</td>
<td>2.81</td>
<td>.15</td>
</tr>
<tr>
<td>Technical instruction with modelling athlete $\rightarrow$ Positive reinforcement athlete</td>
<td>3.31</td>
<td>3.59</td>
<td>.11</td>
</tr>
</tbody>
</table>

Sequences of three or more coaching behaviours are represented by lines connecting two cells, two frequently occurring first order transitions, on the lagged phase plot (Figure 4). These sequences represent the coach observing the athletes, providing
individualized instruction or feedback, and then resuming observation. The coach also commonly used the sequence of positive reinforcement, followed by individualized technical instruction with modelling, and back to positive reinforcement again. This pattern illustrates that coach displayed a consistent exhibition of positive feedback, either in concert with individualized technical feedback or as a stand alone communication (as in the transition to and from observation).
Figure 4. The lagged phase plot SSG’s for the coach summed across all practices, with both first and second order transitions.
Chapter 5

Discussion

The purpose of the present study was to examine the coach-athlete interactions occurring in a successful sport program for athletes with disabilities and their able-bodied siblings. The results will be discussed in relation to the variability and behavioural content patterns (attractor states) of the coach-athlete interactions, as well as the coach’s behaviour sequences. These concepts will be discussed in relation to both the team as a whole and the different groups within the team. While no causal links between the coach-athlete interaction structures and the athletes’ sport experiences can be established, the patterns of coach and athlete behaviours will be used to characterize this unique youth sport environment.

Variability

It was observed that the coach-athlete interactions of this team were highly structured in nature. Indeed, the interactions functioned in a few select mutually defined behavioural pairings and were limited to a small area of the total potential state space. This indicates that the coach-athlete interactions of this successful program tended to be consistent and patterned. These findings are congruent with Erickson et al.’s (in press) study, which sought to identify and compare the dynamic coach-athlete interaction structures of two youth sport teams differentiated by their athletes’ performance outcomes and sport experiences. In their study, it was found that the coach-athlete
interactions of the more successful team (with regards to both performance outcomes and athletes’ experiences), exhibited less variability than the interactions of the less successful team. While limited coaching research has directly assessed behavioural variability, the results of the present study, in conjunction with the findings of Erickson and colleagues (in press) indicate that reduced variability in coach-athlete interactions may be associated with positive athlete outcomes.

The notion that reduced variability may be a characteristic of effective coaching is in line with Becker’s (2009) exploration of elite athletes’ experiences of great coaching. Using qualitative interviews, Becker (2009) found that athletes described great coaches as being consistent in how they maintained their coach-athlete relationships and how they managed the overall sport environment. Moreover, athletes reported that this consistency enabled them to focus on their own development and performance since they knew exactly what to expect from their coaches. Dorfman (2003) and Anshel (1997) similarly suggested that predictability and consistency in coach behaviours can positively influence athletes’ focus and confidence. Furthermore, d’Arripe-Longueville and colleagues (2001) qualitatively identified consistent patterns of coach-athlete interaction across highly unstable performance conditions in elite level archery competitions. Interpreting the present results in light of these studies, it might be argued that successful coaches interact with both their athletes and the environment in relatively patterned, predictable ways. In doing so, these coaches may create a sport context that is conducive to positive athlete outcomes.
Coach’s Behavioural Content Patterns

Use of silence/observation.

In line with a previous state space grid study (Erickson et al., in press), the athletes in the present study spent the majority of their time engaged in practice activities. While the athletes were on task, observation was the largest coaching behavioural category in both frequency and duration. This indicates that the coach spent long periods of the time observing the practice, without directly interacting with the athletes. While this could be viewed as the coach frequently being “off task,” it has been proposed that silent observation is not necessarily a negative behaviour as it would be unrealistic to expect coaches to constantly interact with their athletes (Miller, 1992; Potrac et al., 2007). This is supported by the work of Erickson et al. (in press) and Trudel et al. (1996) that found that observation comprised a large proportion of coach’s behaviours both in practice and competition settings. Furthermore, Cushion and Jones (2001) highlighted the important role of observation in successful coaching as it provides an opportunity for insightful analysis and reflection. These findings imply that observation is an integral component of coaches’ behavioural repertoires and may thus have an important impact on the quality of youth’s sport experience. Since it remains unclear why this may be the case, it would be worthwhile for future studies to further explore the role of observation in the coaching process.
Use of organization.

The second most commonly employed coaching behaviour was organization, which accounted for 16.7% of the total practice time. This corresponds to Lacy and Goldston’s (1990) study that found that organization comprised 15.3% of high school basketball coaches’ behaviours in practice over the course of a season. This also confirms previous findings that coaches are responsible for explaining to athletes what to do, how to do it, and why they are doing it (Franks, Hodges, & Moore, 2001; Potrac & Purdy, 2004).

Interestingly, the coach of this program spent a similar proportion of practice time providing organizational (16.7%) and technical instructions (17.2%). This is in contrast to Lacy and Darst (1985) who reported that organization behaviours occurred far less frequently than instruction behaviours in their observation of winning high school football coaches. One possible explanation for this finding may be that the coach of this program had to adapt her organizational instructions to the unique needs and abilities of each of the athletes on the team. Indeed, it was often observed that the coach would change the qualities of certain practice sets according to the athletes’ competitive level, and swimming abilities. Cregan and colleagues (2007) echo this sentiment as they propose that successful coaches of elite swimmers with disabilities were able to be creative and individualize their coaching strategies. It is possible that by taking her
athletes’ specific needs into account, this may help the coach cultivate symbiotic relationships with her athletes.

While the majority of the coach’s organizational instructions occurred while the athletes were engaged, it is important to note that the athletes’ exhibited other behaviours during organization-based interactions. For example, the athletes in this program also used these interactions as an opportunity to discuss technical matters and to ask questions to clarify instructions. This finding suggests that organization-based interactions may enable athletes to actively engage in their practice session. This differs from research within the physical education setting which posits that since organization is a more passive activity, time spent on organizational activities should be minimized in order for effective learning to occur (Behets, 1997; Hastie, 1994; Lacy, Willison, & Hicks, 1998). A possible explanation for this finding may be that organizational instructions were very individualized within this program. As such, not all athletes received organization instructions at the same time, thereby allowing other athletes in the program to be active while the coach exhibited organizational behaviours with a small number of athletes. In addition, since organizational instructions were given on an individual basis, this may enable these interactions to be more reciprocal in nature. Although direct links between athletes’ outcomes and organization behaviours cannot be established, the results of the present study add to our understanding of the role of organizational coaching behaviours and may help to illuminate the positive aspect of these behaviours. However, future investigations examining the effectiveness of organizational instructions are needed.
Use of instruction.

Technical instruction was the third most commonly exhibited coaching behaviour. This is in line with previous research which indicates that instruction is an essential element of effective coaching (Cushion & Jones, 2001; Lacy & Darst, 1985; Potrac et al., 2007). While previous studies in youth sport (e.g., Miller, 1992) found instruction to be the top behavioural category, the amount of instruction in this study was lower than those previously found. However, it may be argued that the effectiveness of instruction within this context may be attributed to the quality of the instruction, rather than the quantity.

First, technical instruction within this program was very individualized. Indeed, approximately 77% of the coach’s technical instructions (while the athletes were engaged) were directed towards individual athletes. This finding suggests that individualized technical instruction may be a key characteristic of a successful and positive sport environment. This reinforces previous studies by Keegan and colleagues (Keegan et al., 2009; Keegan et al., 2010) that found that one-on-one coaching had a very positive influence on the motivation of both younger (7-11) and older (9-18) sport participants. In addition, the coach’s consistent use of individualized instruction parallels studies of successful basketball coaches Pat Summit (Becker & Wrisberg, 2008) and John Wooden (Gallimore & Tharp, 2004; Nater & Gallimore, 2006) which revealed that these coaches tended to individualize their instructions according to each athlete’s level of development and performance. Overall, these studies suggest that individualized
instruction may have a positive influence on athletes’ outcomes. Furthermore, they highlight the importance of examining not only the content of coach behaviours, but the target of these behaviours as well.

A second important aspect of the coach’s instruction was that the coach consistently incorporated modelling or demonstration into her technical instructions. Demonstration has been shown to be a valuable method for teaching motor skills (Patterson & Lee, 2008). Indeed, it is believed that demonstrations can enable athletes to actively engage in the learning process as they not simply trying to copy performance, but are rather problem solving (Hodges & Franks, 2002). Research also suggests that interspersing demonstrations with physical practices can be beneficial for motor skill acquisition (Patterson & Lee, 2008). Interpreting the coach’s use of modelling in light of this research, it might be argued that technical instruction with modelling may be an integral element of effective coaching.

**Use of feedback.**

Overall, the coach of this program employed a very positive and individualized style of providing feedback. The results indicate that the coach frequently used short bouts of positive reinforcement during the team’s practice sessions. The results also show that the coach of this program spent more time directing positive reinforcement to individual athletes, rather than the whole team. Finally, the coach spent very little time providing negative feedback without corrective information. The high degree of positive reinforcement is consistent with the findings of Smith, Smoll, and colleagues (Curtis et
al., 1979; Smith & Smoll, 1990; Smoll et al., 1978; Smith et al., 1983). Furthermore, the emphasis on individualized positive reinforcement within this program complements Erickson et al.’s (in press) finding that the individualization of positive reinforcement was one of the key characteristics that differentiated a more successful coach from a less successful coach. One might infer from these results that given adequately high levels of positive reinforcement, the direction (individual vs. team) may be a salient quality in determining the efficacy of that positive reinforcement.

**Additional behavioural content patterns.**

One of the interesting behavioural categories that emerged from the observation of the coach-athlete interactions occurring within this program was humour. The degree to which the coach employed humour was higher than previously found with Canadian National team coaches (Horton, Baker, & Deakin, 2005). Within this particular program, the results suggest that the coach of this program tried to cultivate a positive sport environment through the use of humour. Indeed, humour has been proposed as an effective method by which to promote enjoyment and positive coach-athlete relationships (Cushion & Jones, 2001; Segrave & Ciancio, 1990). While the results indicate that humour may be an important element of positive coaching behaviours, further studies should be conducted to enhance our understanding of the role of humour in the coaching process.

Another noteworthy coaching behaviour that occurred within this program was coach-initiated athlete input. This behavioural category referred to those interactions
where the coach asked the athlete how they were feeling, what their capabilities were, or asked about their opinions on a certain set or drill. Since coach-initiated athlete input was the sixth most frequently occurring coaching behaviour, it is evident that this behaviour was an important element of the coach’s behavioural repertoire. This is important given the links between this behavioural category and the autonomy-supportive coaching strategies promoted by Mageau and Vallerand (2003). Specifically, this behaviour shares striking similarities to the strategies of providing athletes with choice within specific rules and limits and providing athletes with opportunities for initiative taking and independent work. Given that previous studies have found a consistent association between these behaviours and athletes’ perceived needs satisfaction (e.g., Gagné et al., 2003; Hollembeak & Amorose, 2005) this coaching behaviour may have important implications for athletes’ sport experiences.

Overall, the findings of the present study lend new insight into the nature of coaching behaviours and the critical dimensions that may characterize positive sport environments. For further depth of understanding, the coach’s results support the utility of conceptualizing behaviour as a function of direction and duration, as well as content, rather than simply an instantaneous occurrence by an isolated actor as in simple frequency counts. In addition, these results highlight the importance examining the athletes’ behaviour in conjunction with coach’s behaviour in order to garner a more holistic understanding of coach-athlete interactions and their role in shaping the quality of athletes’ sport experiences.
Athletes’ Behaviours

The athletes in this program spent the majority of their practice time engaged in practice activities, such as swimming during assigned sets or resting during appropriate rest periods. Other commonly exhibited athlete behaviours included talking with their teammates and discussion with the coach either about technical, performance related topics or general, non-sport related topics. These results are consistent with Erickson et al.’s (in press) findings with athletes of two synchronized swimming teams. Minimal research has directly observed athletes’ behaviours within the youth sport setting. Therefore, while the results of the present study offer some initial insight into athletes’ contributions to coach-athlete interactions, future research in this area is certainly warranted.

Coach Behaviour Transitions and Sequences

The most commonly occurring behavioural transition was between observation and organization. Outside of this pairing, the coach often combined observation with subsequent positive reinforcement, technical instruction with modelling, technical cues, or general communication to individual athletes. These behavioural sequences indicate that observation was a key aspect of the coach’s behavioural patterns. In addition, they reveal that interactive coach behaviours, such as instruction and feedback, were often interspersed between periods of sustained observation. As such, the coach of this program tended to conform to a pattern of coaching similar to that observed by Cushion and Jones (2001) and Potrac et al. (2007) where after getting the athletes on task, coaches quietly
observed athletes for a while before intervening. Following intervention, the coaches often transitioned back into observation, giving instruction and feedback as deemed necessary.

By examining the results of the present study in conjunction with previous research, it could be argued that observation provides coaches with an opportunity to reflect and analyze before proceeding to the next behaviour. For example, the coach tended to display a period of observation in between providing technical instruction and positive reinforcement. In doing so, the coach may be ensuring that her athletes adhere to her feedback before giving praise. While further research is needed to substantiate this claim, the results provide some initial support for the notion that observation may be a crucial element of effective coaching. Furthermore, the findings highlight how the temporal sequencing of behaviours can enhance our understanding of coach-athlete interactions in sport.

**Comparisons between Groups**

Whereas the previous sections examined the variability and behavioural content patterns of the team as a whole, the following sections explore whether differences existed when comparing the coach-athlete interactions of competitive vs. recreational athletes and athletes with disabilities vs. able bodied athletes. When analyzing the variability of the coach-athlete interactions across the various groups, the only difference which emerged was that the mean number of transitions between cells was significantly higher for interactions occurring between the coach and competitive athletes than those
between the coach and recreational athletes. These results indicate that while the coach-athlete interactions of both competitive and recreational athletes were relatively patterned and tended to remain stable, the coach-athlete interactions of the competitive athletes were highly variable within that pattern. One possible explanation for these results is that the coach employed a more interactive style with the competitive athletes, in which both parties oscillated between talking and listening to each other. This complements Bloom, Schinke, and Salmela’s (1997) finding that coaches tended to utilize an autocratic style with club level athletes and a two-way communication style with elite level athletes. However, further exploration is necessary to determine the influence of athletes’ competitive level on the variability of coach-athlete interactions.

In comparing the content of the coach-athlete interactions between the different athlete groups, the results indicate that the coach exhibited higher levels of individualized positive reinforcement and technical instruction with modelling with the competitive athletes than the recreational athletes. This behavioural pattern may be attributed to the fact that the competitive stream of this program is purposefully structured to improve performance levels and to facilitate skill development. As such, the coach is required to prescribe instruction and feedback that will enhance each athlete’s skill set. This reinforces the proposition of Côté et al. (2007) that effective performance coaches need to be able to analyze their athletes’ abilities and then provide the necessary instruction and feedback to challenge their athletes to improve. Although these findings offer some
insight into how athletes’ competitive level may impact coaching behaviour, further investigation in this area is needed.

Interestingly, the results revealed no significant differences in the coach or athletes’ behaviours in relation to the athletes’ disability status. This finding lends support to DePauw and Gavron’s (2005) suggestion that coaching athletes with disabilities requires many of the same skills as coaching able-bodied athletes. Thus, coaches of athletes with disabilities can employ similar coaching strategies as coaches of able bodied athletes (i.e., individualized technical instruction, positive reinforcement). These results also complement modern discourse in sport psychology and adapted physical activity which emphasizes the “athlete first” philosophy (DePauw & Gavron, 1991, 2005; Cregan et al., 2007; Hanrahan, 2004, 2007; Martin, 1999). Athletes with disabilities should thus be viewed as athletes who have a disability, rather than as disabled people who participate in sport (Banack et al., in press; Hanrahan, 2007; Martin, 1999). Therefore, coaches should always focus on cultivating positive sport environment, regardless of the disability status of their athletes.

Nonetheless, it is still crucial for coaches and sport practitioners to recognize the unique and distinct qualities of the disability sport context. For instance, the coaching behaviour of “physical assistance” as captured by the PARA-CAICS, is a behaviour that may not be applicable to able-bodied sport, but is a salient feature of the disability sport environment. In addition, it is important to note that although this sport program included both athletes with disabilities and able bodied athletes, it only included the able-
bodied siblings of the athletes with disabilities. As such, while this is program can be viewed as an integrated sport environment, the coach was very selective regarding which able bodied athletes could participate in the program. In light of this, it may be beneficial for future research to examine able bodied and disability sport separately before attempting to explore how these two contexts can be effectively integrated.

Finally, it is important to note that a significant effect for time emerged when comparing the behavioural content of the coach-athlete interactions between the different athlete groups, but not when comparing the variability of these interactions. This finding implies that while the mean duration of time that the coach and athletes’ displayed certain behaviours varied between practices, the range of behaviours that the coach and athletes displayed did not differ between training sessions. Since it is unclear why this may be the case, further exploration of this phenomenon is necessary. In particular, future studies may examine how the content of practice sessions (individual drills vs. team activities) or the timing of practice sessions relative to the team’s competition schedule may influence coach-athlete interactions.

**Integrated Picture of Coach-Athlete Interactions**

Although it may be interesting to explore the different aspects of coach-athlete interaction structures separately, it is likely that their combination has the greatest influence on the athlete outcomes produced within this unique sport environment. Overall, the coach-athlete interactions of this program are characterized by deliberate action, individualized attention, and positive, respectful relationships. First, these
interactions are deliberate as shown by the heavily patterned modes of interaction. One of the key elements of this patterning is the coach’s use of silent observation as a period of reflection and analysis. Second, the coach emphasized the use of individualized coaching behaviours. This pattern was consistent for both technical behaviours such as technical instruction and positive reinforcement, and general, non-sport related behaviours, including general communication and humour. Finally, the interactions occurring within this program can be seen as the foundation of positive and respectful coach-athlete relationships as the coach purposefully sought the athletes’ input during practices. In addition, the coach promoted an environment in which the athletes were not defined by their disabilities. Sport programs and coaches who wish to increase the quality of their athletes’ sport experiences can consider these factors and incorporate them into their own sport environments.
Chapter 6

Conclusions

The purpose of this study was to analyze the coach-athlete interactions occurring in a successful sport program for athletes with disabilities and their able-bodied siblings. The successful nature of this program was established by its athletes’ competitive achievements and by the athletes’ reports of positive experiences within this sport environment. This study utilized state space grid observational methodology and was the second application of this methodology in field-based sport psychology research.

The coach-athlete interactions of this successful team were highly patterned, indicating that relatively patterned coach-athlete interaction practices may facilitate positive athlete outcomes. Within this consistent pattern, the coach spent most of her time silently observing the athletes. Other commonly exhibited behaviours included individualized technical instruction, organization, and positive feedback. With regards to behavioural sequencing, the coach’s time spent observing the athletes was often interspersed with periods of organization, instruction, and feedback. The coach appeared to adapt her coaching style according to the competitive levels of the athletes, but employed similar behaviours with both athletes with disabilities and able-bodied athletes. Overall, this successful sport environment was characterized by positive coach-athlete interactions that were deliberately patterned and mutually respectful.

The findings of this study offer insight into the characteristics of coach-athlete interactions occurring within a unique youth sport environment. In particular, these
results add to the coaching literature by examining coach-athlete interactions in an understudied population. Additionally, by examining the dynamic and reciprocal nature of coach-athlete interactions, the results of the present study may contribute to the literature by enhancing our understanding of the coaching process. In doing so, these findings may enable current and future coaches to cultivate sport environments that are conducive to positive athlete outcomes.

**Limitations and Future Directions**

The implications of these findings should be considered in light of the limitation inherent to this study. First, this study was conducted as an observation of only one sport environment, comprised of one head coach and twenty-four athletes. Examination of a greater number of environments would be highly beneficial and would strengthen the arguments regarding the nature of coach-athlete interactions that foster positive athlete outcomes. However, the extremely unique nature of the program under study, with such a diverse range of athletes under the tutelage of one coach, necessitated the limiting of the sample to one team. In addition, given the exploratory nature of this study, the greater depth of the analysis was considered a high priority. The directions provided by the findings of this study might be investigated in greater breadth in future research.

A second potential limitation concerns how generalizable the present findings are to other sports or competitive contexts. It may be that the observed structural qualities are reflective only of this unique swimming environment. Given the present study’s findings regarding differences based on the athletes’ competitive level, these results suggest that
Further exploration of coach-athlete interactions across a range of different contexts might be necessary. Third, the results of this study indicate that coach-athlete interactions may vary between practice sessions. Therefore, longitudinal designs evaluating the impact of time on the nature of coach-athlete interactions would enhance our understanding of the coaching process. Finally, it was beyond the scope of the present study to examine the coach’s and athletes’ perceptions of the interactions occurring within this program. Future qualitative studies may thus be eminently useful in exploring the reasoning behind the content and structure of coach-athlete interactions.

Overall, this study advanced our understanding of coach-athlete interactions, especially within the disability sport context. This study adds to the growing body of literature which suggests that coaching is an essential element of the youth sport environment. In addition, this study illustrates how the both the content and structure of interactions might shape the quality of youth’s sport experiences. If all youth, regardless of disability status, experience sport in positive and supportive coaching environments, this may have important implications for youth development.
References


80


http://www.kingstonwhigstandard.com/media/sections/YMCA.pdf


Appendix A

Letters of Information
Information Sheet (coach) - Examining the influence of coach behaviours on youth’s positive developmental experiences in sport

The purpose of this study is to examine how coach behaviours affect youth’s development in sport. Specifically, the goal is to understand how the different ways coaches interact with athletes during practices influences athletes’ perceptions of their experiences in sport.

The study will have each athlete complete a questionnaire related to his/her experience with the swim program. Multiple practices in that sport setting will then be videotaped. As a coach, you will be wearing a microphone to record any talking. The videotaped practices will then be watched by the research team to understand the different coach-athlete interactions (i.e., patterns and sequences of coach/athlete interactions). The study will also consist of an interview with the researcher. The interview will take place at the practice setting and will take no longer than one hour. There are no known or foreseeable risks involved by participating in this study.

This is part of a study for which Jennifer Murphy-Mills is the primary researcher. Information collected from the coach will remain completely confidential. Although we will report direct quotations from the interviews, each interview participant will be given a pseudonym (false name), and all identifying information will be removed. For the entire study, all information collected will be kept in a locked filing cabinet by the primary researcher. Items will be available to the primary researcher and her supervisors.

The information collected will be coded for anonymity to keep individuals identity secure. While the information collected may be presented at academic conferences and published in relevant academic journals, anonymity and confidentiality of all participants will be maintained.

Should you have further questions or concerns regarding any aspect of this study, please contact any of the individuals listed below.

Primary Researcher: Jennifer Murphy-Mills
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General Ethics Review Board: Dr. Joan Stevenson (Chair)
Queen’s University
(613) 533-6081
Email: chair.greb@queensu.ca
Information Sheet (athletes and parents) – Examining the influence of coach behaviours on youth’s positive developmental experiences in sport

The purpose of this study is to examine how coach behaviours affect youth’s development in sport. Specifically, the goal is to understand how the different ways coaches interact with athletes during practices influences athletes’ perceptions of their experiences in sport.

The study will have each athlete complete a questionnaire related to his/her experience with the swim program. Multiple practices in that sport setting will then be videotaped. Coaches will be wearing a microphone to record any talking. The videotaped practices will then be watched by the research team to understand the different coach-athlete interactions (i.e., patterns and sequences of coach/athlete interactions). The study will also involve some athletes participating in an interview with the researcher. The interview will be conducted at the practice setting and will take no longer than 1 hour. There are no known or foreseeable risks involved by participating in this study.

This is part of a study for which Jennifer Murphy-Mills is the primary researcher. Information collected from participants will remain completely confidential. Although we may report direct quotations from the interviews, each interview participant will be given a pseudonym (false name), and all identifying information will be removed. For the entire study, all information collected will be kept in a locked filing cabinet by the primary researcher. This collected information will be available only to the primary researcher and her supervisors.

The information collected will be coded for anonymity to keep individuals identity secure. While the information collected may be presented at academic conferences and published in relevant academic journals, anonymity and confidentiality of all participants will be maintained.

Should you have further questions or concerns regarding any aspect of this study, please contact any of the individuals listed below.

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Appendix B

Consent Forms
PARTICIPANT CONSENT FORM - COACH

Examining the influence of coach behaviours on youth’s positive developmental experiences in sport

I have read the information letter and understand that this study requires the athletes I coach to complete a survey regarding their experiences in our specific sport setting (i.e., on this specific team, with me as a coach). I also understand that the second part of this study involves the videotaping of multiple practices in order to examine interactions between coaches and athletes. Finally, I understand that I will be asked to participate in an interview with the researcher.

I have been informed that my confidentiality will be protected throughout the study, and that the information I provide will be available only to the primary researcher and her supervisors.

I understand that my participation in this research project is completely voluntary and that I reserve the right not to answer any question(s) I do not feel comfortable with. I also recognize that I may stop participating at any time without explanation or consequence.

Finally, any questions I have about this research project and my participation have been answered to my satisfaction. I understand that I am invited to contact the primary researcher, the project supervisors, and/or the General Ethics Review Board should any further questions or concerns about this research project or my participation arise.

I consent to participate in this research project.

Name of Participant: [Participant's Name]
Signature: [Signature]
Date: [Date]

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PARTICIPANT CONSENT FORM - ATHLETE

Examining the influence of coach behaviours on youth’s positive developmental experiences in sport

I have read the information letter and understand that this study requires my child to complete a survey regarding their experience in a specific sport setting (i.e., on a specific team, with a specific coach). As well, I understand that the second part of this study involves the videotaping of multiple practices in order to examine interactions between coaches and athletes. Finally, I understand that my child may also be asked to participate in an interview with the researcher.

I have been informed that my child’s confidentiality will be protected throughout the study, and that the information he/she provides will be available only to the primary researcher and her supervisors.

I understand that my child’s participation in this research project is completely voluntary and that he/she has the right not to answer any question(s) that he/she does not feel comfortable with. I also recognize that my child may stop participating at any time without explanation or consequence.

Finally, any questions I have about this research project and my child’s participation have been answered to my satisfaction. I understand that I can contact the primary researcher, the project supervisors, and/or the General Ethics Review Board should any further questions or concerns about my child’s participation in this research project arise.

I consent to participate in this research project.

Participant’s Signature: _________________________ Date: _____________

Parent/Guardian Signature: _________________________ Date: _____________

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Appendix C
Questionnaire
Questionnaire

Name: ___________________ Birthdate: ______  Age: ___ Gender: _____

Age at which you started sport: ____

INSTRUCTIONS: Please complete each of the two parts of the survey.
This questionnaire is designed to assess your perceptions of your sport experience and your coach. There are no right or wrong answers so please give your immediate reaction. Some of the questions may seem similar but please answer ALL questions. Your honest responses are very important to us. Your responses will be kept in strictest confidence (Neither your coach nor anyone else with the team will see your responses).

Part 1. The following questions ask about your feelings about your sport experience. Please circle a number from 1 to 4 to show how much you agree with each statement.

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<td>1. I became better at giving feedback</td>
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32. Adult leaders encouraged me to do something I believed morally wrong  

33. Other youth in this activity made inappropriate sexual comments, jokes, or gestures  

34. Youth in this activity got me into drinking alcohol or using drugs  

35. I got stuck doing more than my fair share  

36. There were cliques in this activity  

37. This activity has stressed me out  

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<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part 2. The following questions ask about your feelings about your relationship with your coach. Please respond to each statement by indicating how true it is for you. Use the following scale.**

<table>
<thead>
<tr>
<th></th>
<th>Not At All True</th>
<th>Some what True</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When I am with my coach, I feel free to be who I am.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. When I am with my coach, I feel like a competent person.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. When I am with my coach, I feel loved and cared about.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. When I am with my coach, I often feel inadequate or incompetent.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
5. When I am with my coach, I have a say in what happens, and I can voice my opinion. ○ ○ ○ ○ ○ ○ ○ ○

6. When I am with my coach, I often feel a lot of distance in our relationship. ○ ○ ○ ○ ○ ○ ○ ○

7. When I am with my coach, I feel very capable and effective. ○ ○ ○ ○ ○ ○ ○ ○

8. When I am with my coach, I feel a lot of closeness. ○ ○ ○ ○ ○ ○ ○ ○

9. When I am with my coach, I feel controlled and pressured to be certain ways. ○ ○ ○ ○ ○ ○ ○ ○

Thank you for your time!
Appendix D
Coding Manual
**Coding Manual - Quick Reference Sheet**

**Subject (letters)**
- z – Coach
- 99 – Team
- o – Others (E.g., assistant coaches)
- a, b, c…x – Athletes a, b, c…x

**Coach Content (10’s and 20’s)**

10 – Humour
- E.g., “I’m a poet and I didn’t know it”

11 – Positive Reinforcement and Encouragement
- E.g., “good job”, thumbs up, etc.

12 – Coach-Initiated Athlete Input
- E.g., “how are you feeling today?”, “what stroke would you like to do in this set?”, etc.

13 – Technical Instruction with Modelling
- E.g., coach verbally and physically demonstrates catch-up drill, etc.

14 – Technical Instruction
- E.g., “make sure to stay streamlined on this set”, etc.

15 - Cues
- E.g., “kick!”, “head neutral!”, etc.

16 – Inter/Intra-Personal Instruction
- E.g., “you have to set an example for the others”, etc.

17 - Organization
- E.g., “now we’re doing ___ drill”, etc.

18 - Observation
- Default code if coach is engaged in practice but criteria not met for any actively communicative code

19 – General Communication
- E.g., talking about Olympics, school, etc.
- Default code when conversation doesn’t fit into other categories

20 – Not Engaged
- E.g., talking to lifeguards, other pool patrons, etc.

21 – Physical Assistance
- E.g., lifts an athlete into the pool, helps put goggles on, etc.

22 – Keeping Control
- E.g., “time to get back to swimming”, etc.

23 – Error Technical
- E.g., “you did ___ wrong”, etc.

24 – Negative Evaluation
- E.g., “that was terrible”, shaking head, etc.
**Athlete Content (30’s)**

31 – Technical Talking
- E.g., “I like that”, “why don’t we do ___ instead”, etc.

32 – Clarification
- E.g., “how many do I have to do?”, “I don’t understand”, etc.

33 - Acknowledgement
- E.g., “got it”, nodding, etc.

34 – General Communication with Athlete
- E.g. talking about school, etc.
- Default code if coder cannot hear content of interaction between athletes

35 – General Communication with Coach
- E.g. talking about school, etc.
- Default code if coder cannot hear content of interaction between athlete and coach

36 - Engaged
- E.g., swimming laps, resting during assigned rest periods, etc.
- Default code if not actively interacting with someone and not disengaged
- Assumed to be engaged when out of view during a set

37 - Disengaged
- E.g., actively disrupting practice, ignoring coach, etc.

38- Helping Others
- E.g., getting a teammates equipment

39- Positive Response
- E.g., laughing or smiling

**Notes**
- 99 – Uncodable coach
- 66 – Uncodable athlete
- 3-second rule for: 18, 36, 66, 99
Subjects

Coach – z
Athlete a – a
Athlete b – b
Athlete c – c
Athlete d – d
Athlete e – e
Athlete f – f
Athlete g – g
Athlete h – h
Athlete i – i
Athlete j – j
Athlete k – k
Athlete l – l
Athlete m – m
Athlete n – n
Athlete o – o
Athlete p – p
Athlete q – q
Athlete r – r
Athlete s – s
Athlete t – t
Athlete u – u
Athlete v – v
Athlete w – w
Athlete x – x
Team – 99
Coach Content

10 - Humour
Deliberate attempt to include humour in the practice. Can refer to the coach’s use of humour or encouragement of athletes to use humour themselves.

Notes
- E.g. “I’m a poet and I didn’t know it”
- Sharing a joke an athlete made up with the rest of the team.
- Can include sarcastic joking (e.g. “I give you permission to beat her up”) as long as it is clearly delivered in a humourous manner.

11 - Positive Reinforcement and Encouragement
Positive reaction by coach to desirable performance by athlete(s) or non-technical encouragement from coach either in response to athlete(s) mistake or coach-initiated.

Notes
- Focus is on success.
- Verbal (e.g., “goodjob”, “well done”, “you’ll do better next time”, etc.)
- Non-verbal (e.g., thumbs up, high five, etc.)
- If non-verbal, must be very obvious communication.

12 - Coach-Initiated Athlete Input
Coach asks the athlete how they are feeling, what their capabilities are, or their opinions on the set or drill.

Notes
- E.g., “how is your headache today?”, “do you feel that you’ll be able to do the kicking in this drill?”, “what stroke would you like do in this set?”, etc.
- Does not including asking questions for the purpose of assessing knowledge (e.g. “what are the five key points to remember about butterfly technique?”)

13 - Technical Instruction with Modelling
Coach provides technical instruction while physically demonstrating the performance of the skill or technique or coach physically manipulates athlete to demonstrate technique.

Notes
- E.g., coach verbally explains how to perform the catch-up drill while physically demonstrating it with her arms, etc.
- E.g. manipulating an athlete’s arms to demonstrate proper freestyle technique
14 - Technical Instruction
Technical/teaching instruction from coach, either in response to athlete(s) mistake or coach-initiated. Requires specific instruction regarding how the athlete can perform the skill correctly.

Notes
- E.g., “make sure to explode off the wall coming out of your turn”, etc.
- Can include pointing out athlete mistake (normally coded as ‘error technical’) but must be immediately preceded or followed (3-second rule) by corrective information (i.e. how to fix the mistake) to be coded as ‘technical instruction (with or without) modelling’ (e.g., “I could see you looking forward, your head was too far back. Make sure that you keep your head neutral”).
- Can also be in the form of a question for the purpose of testing knowledge.

15 - Cues
1-3 keys words delivered while the athlete is swimming (i.e., while head is out of water).

Notes
- E.g., “streamline!” “head neutral!” etc.
- If athlete stops swimming and moves over to side of lane or pool, coach interaction should not be coded as cues.

16 - Inter/Intra-Personal Instruction
Deliberate attempt to instil attitudes, skills, etc that are conducive to personal development (i.e. setting an example (leadership), teaching responsibility, teaching athletes to interact pleasantly with one another or with the coach or providing support, assistance, and feedback to teammates.

- E.g. “you have to set an example for the other swimmers”, etc
- E.g. “it is a swimmer’s job to be responsible for themselves”, etc

17 - Organization
Communication from coach related to organization of practice tasks and athlete actions, NOT intended to directly influence performance.

Notes
- E.g., “now we’re doing ___ drill”, “go over there”, etc.
- Cannot include any technical instruction or encouragement. Code for each separately, even if they occur in immediate sequence (e.g., “Get ready for 50 free—catch-up. Remember to stay streamlined. I know you guys can do it!” to be coded as ‘organization’ then ‘technical instruction without modelling or physical assistance’, then ‘positive reinforcement and encouragement’).
- Must code recipient (athlete, team, or other)
18 - Observation
Coach engaged in observing/watching athletes during practice activities, though not directly communicating with athletes.

Notes
- Default code if coach is engaged in practice but criteria not met for any actively communicative code.
- 3-second rule in effect before coding for observation from an actively communicative code.

19 - General Communication
Communication with athletes, assistant coaches, parents or siblings, unrelated to task or performance.

Notes
- Default category when communication does not fit into other conversational categories (e.g. technical instruction, humour etc).
- E.g., talking about school, Olympics, etc.
- Code recipient as athlete, team, or other

20 - Not Engaged
Coach not engaged in practice activities directed at athletes and not directly communicating with athletes.

Notes
- E.g. talking to lifeguards, other pool patrons, etc.

21 - Physical Assistance
Coach helps the athlete into or out of the pool, or helps the athlete with their equipment (e.g., flippers, goggles, etc.)

Notes
- E.g., lifts an athlete out of their wheelchair and into the pool, helps an athlete put their flippers on in the pool, etc.

22 - Keeping Control
Verbal reaction by coach intended to maintain order in response to athlete(s) inattentiveness, disruptive non-task related conduct, etc.

Notes
- E.g., “get back to swimming!”, “stop talking!”, etc.
23 - *Error Technical*
Technical negative reaction by coach to an undesirable performance by athlete(s) WITHOUT any corrective information; pointing out mistake.

**Notes**
- E.g., “you did ___ wrong”, “your leg was too low”, etc.
- Code as ‘technical instruction (with or without) modelling’ if directly preceded or followed (3-second rule) by corrective information (i.e., how to fix the mistake)

24 - *Negative Evaluation*
Non-technical negative reaction by coach to an undesirable performance by athlete(s).

**Notes**
- Verbal (e.g., “that was terrible”, etc.)
- Non-verbal (e.g., shaking head, etc.)
- If non-verbal, must be very obvious communication.

99 - *Uncodable*

**Notes**
- To be coded if coach is out of view with no verbal communication detected or microphone cuts out.
- 3-second rule in effect before coding for ‘uncodable’.

**Athlete Content**

**Note** - No recipient code. Behaviours are either coach or peer-directed.

31 - *Technical Talking*
Communication discussing task/technique, with athlete providing input/opinion.

**Notes**
- E.g., “I like that”, “why don’t we do ___ instead”, offering answer to coach’s technical question/quiz, etc.
- Can be coded if body language indicates, even if not heard (MUST be very obvious). If in doubt, code as ‘general talking’.

32 - *Clarification*
Communication intended to elicit more information regarding how athlete is expected to perform task/technique.

**Notes**
- Can be question (e.g., “how do I do that again?”, “how many are we doing?”, etc.).
- Can also be a statement (e.g., “I don’t understand, etc.”)
33 - Acknowledgement
Communication intended to confirm that other’s communication is understood WITHOUT any other technical information.

Notes
- Verbal (e.g., “ok”, “got it”, etc.)
- Non-verbal (e.g., thumbs up, nodding, etc.)
- If non-verbal, must be very obvious communication.
- Cannot include any technical talking, clarification, or general talking. Code for each separately, even if they occur in immediate sequence.

34 - General Communication with Athlete
Communication with other athletes.

Notes
- E.g., talking about school, etc.
- Default actively communicative code if coder cannot hear content of interaction between athletes.
- Code for involvement in a conversation whether the athlete is actively talking or listening (i.e. one continuous code for the duration of a conversation where an athlete is speaking or being spoken to).

35 - General Talking with Coach
Communication with coach unrelated to talk or performance.

Notes
- E.g., talking about school, etc.
- Default actively communicative code if coder cannot hear content of interaction between athlete and coach.
- Code for involvement in a conversation whether the athlete is actively talking or listening (i.e. one continuous code for the duration of a conversation where an athlete is speaking or being spoken to).
36 - Engaged
Engaged in practice activities and not directly communicating with peers or coach.

Notes
- E.g., doing drills, resting during assigned rest or break times, moving to new pool location on direction from coach, etc.
- Default code for anytime athlete not actively interacting with coach or other athletes unless actively disrupting practice, ignoring coach instructions, etc. (e.g., code for ‘engaged’ when coach talking to group, even if athlete may appear to not be looking at coach, unless actively not listening/being disruptive).
- Assumed to be engaged when out of view of camera during a set
- 3-second rule in effect before coding for ‘engaged’ from an actively communicative code
- Code athletes as ‘engaged’ if talking to an assistant coach. Do not code the content of that interaction (not the target coach).

37 - Disengaged
Not engaged in practice activities and not directly communicating with peers or coach.

Notes
- E.g., actively disrupting practice, ignoring coach instruction, etc.
- Requires athlete to be in opposition to current practice activity (e.g., code athlete resting during assigned rest period as ‘engaged’, code athlete chatting on deck after being told get in the pool by coach as ‘disengaged’).
- Must be very obvious.

38 - Helping Others
Helping teammates with their equipment or physically assisting them.

39 - Positive Response
Positive reaction to coach behaviour including laughing or smiling.

Notes
- Must be very obvious.

66 – Not Codable
Notes
- To be coded if athlete is out of view with no verbal communication detected.
- This is not applicable when athlete is engaged during a set.
- 3-second rule in effect before coding for ‘uncodable’
Table 7. Athlete characteristics.

<table>
<thead>
<tr>
<th>Athlete</th>
<th>Gender</th>
<th>Age</th>
<th>Competitive Level</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Female</td>
<td>16</td>
<td>Regional</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>B</td>
<td>Female</td>
<td>19</td>
<td>International</td>
<td>S6SB6SM6</td>
</tr>
<tr>
<td>C</td>
<td>Male</td>
<td>15</td>
<td>National</td>
<td>S6SB6SM6</td>
</tr>
<tr>
<td>D</td>
<td>Male</td>
<td>15</td>
<td>Provincial</td>
<td>S9SB9SM9</td>
</tr>
<tr>
<td>E</td>
<td>Male</td>
<td>16</td>
<td>International</td>
<td>S8SB8SM8</td>
</tr>
<tr>
<td>F</td>
<td>Male</td>
<td>14</td>
<td>Recreational</td>
<td>Able bodied</td>
</tr>
<tr>
<td>G</td>
<td>Female</td>
<td>17</td>
<td>Provincial</td>
<td>S14</td>
</tr>
<tr>
<td>H</td>
<td>Male</td>
<td>16</td>
<td>Regional</td>
<td>S5SB5SM5</td>
</tr>
<tr>
<td>I</td>
<td>Female</td>
<td>17</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>J</td>
<td>Female</td>
<td>14</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>K</td>
<td>Female</td>
<td>13</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>L</td>
<td>Female</td>
<td>17</td>
<td>National</td>
<td>S6SB6SM6</td>
</tr>
<tr>
<td>M</td>
<td>Female</td>
<td>15</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>N</td>
<td>Male</td>
<td>12</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>O</td>
<td>Female</td>
<td>9</td>
<td>Regional</td>
<td>S10SB9SM10</td>
</tr>
<tr>
<td>P</td>
<td>Female</td>
<td>10</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>Q</td>
<td>Female</td>
<td>8</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>R</td>
<td>Male</td>
<td>9</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>S</td>
<td>Male</td>
<td>11</td>
<td>Recreational</td>
<td>S4SB4SM4</td>
</tr>
<tr>
<td>T</td>
<td>Male</td>
<td>12</td>
<td>Recreational</td>
<td>S15</td>
</tr>
<tr>
<td>U</td>
<td>Male</td>
<td>9</td>
<td>Recreational</td>
<td>Able Bodied</td>
</tr>
<tr>
<td>V</td>
<td>Male</td>
<td>12</td>
<td>Regional</td>
<td>S10SB9SM10</td>
</tr>
<tr>
<td>W</td>
<td>Female</td>
<td>11</td>
<td>Provincial</td>
<td>S8SB7SM8</td>
</tr>
<tr>
<td>X</td>
<td>Female</td>
<td>16</td>
<td>Provincial</td>
<td>S10SB9SM10</td>
</tr>
</tbody>
</table>
Table 8. Pearson correlation coefficients for the subscales of the YES-S and BNSRS.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Personal &amp; social skills</td>
<td>.16</td>
<td>.59**</td>
<td>.63**</td>
<td>-.09</td>
<td>.19</td>
<td>.56**</td>
<td>.54**</td>
<td></td>
</tr>
<tr>
<td>2. Cognitive skills</td>
<td>.26</td>
<td>.08</td>
<td>.27</td>
<td>-.13</td>
<td>-.16</td>
<td>.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Goal setting</td>
<td>.63**</td>
<td>-.15</td>
<td>.35</td>
<td>.48*</td>
<td>.46*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Initiative</td>
<td>-.29</td>
<td>.57**</td>
<td>.75**</td>
<td>.77**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Negative experiences</td>
<td></td>
<td>-.66**</td>
<td>-.31</td>
<td>-.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Autonomy</td>
<td></td>
<td></td>
<td>.57**</td>
<td>.61**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.65**</td>
</tr>
<tr>
<td>8. Relatedness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *Correlation is significant at the 0.05 level (2 tailed)
**Correlation is significant at the 0.01 level (2 tailed)

Table 9. Comparison of the responses of competitive and recreational athletes on the YES-S and the BNSRS.

<table>
<thead>
<tr>
<th></th>
<th>Competitive M (SD)</th>
<th>Recreational M (SD)</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth Experience Survey for Sport</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal and social skills</td>
<td>3.40 (0.40)</td>
<td>3.01 (0.39)</td>
<td>2.32  (20)</td>
<td>0.03</td>
</tr>
<tr>
<td>Cognitive skills</td>
<td>2.30 (0.85)</td>
<td>2.17 (0.56)</td>
<td>0.44  (19)</td>
<td>0.66</td>
</tr>
<tr>
<td>Goal setting</td>
<td>3.60 (0.49)</td>
<td>2.82 (0.56)</td>
<td>3.48  (18)</td>
<td>0.003</td>
</tr>
<tr>
<td>Initiative</td>
<td>3.76 (0.43)</td>
<td>3.55 (0.52)</td>
<td>1.03  (18)</td>
<td>0.32</td>
</tr>
<tr>
<td>Negative experiences</td>
<td>1.27 (0.26)</td>
<td>1.33 (0.29)</td>
<td>-0.53 (18)</td>
<td>0.60</td>
</tr>
<tr>
<td>Basic Need Satisfaction in Relationship Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>6.03 (0.97)</td>
<td>5.83 (0.85)</td>
<td>0.50  (20)</td>
<td>0.62</td>
</tr>
<tr>
<td>Competence</td>
<td>6.42 (1.04)</td>
<td>6.18 (0.98)</td>
<td>1.72  (20)</td>
<td>0.59</td>
</tr>
<tr>
<td>Relatedness</td>
<td>6.03 (0.99)</td>
<td>5.63 (0.69)</td>
<td>1.10  (19)</td>
<td>0.29</td>
</tr>
</tbody>
</table>
Table 10. Comparison of the responses of able bodied athletes and athletes with disabilities on the YES-S and the BNSRS.

<table>
<thead>
<tr>
<th></th>
<th>Able bodied athletes M (SD)</th>
<th>Athletes with disabilities M (SD)</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Youth Experience Survey for Sport</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal and social skills</td>
<td>3.08 (0.48)</td>
<td>3.34 (0.37)</td>
<td>-1.40 (17)</td>
<td>0.18</td>
</tr>
<tr>
<td>Cognitive skills</td>
<td>2.23 (0.53)</td>
<td>2.25 (0.87)</td>
<td>-0.08 (18)</td>
<td>0.93</td>
</tr>
<tr>
<td>Goal setting</td>
<td>2.87 (0.64)</td>
<td>3.56 (0.48)</td>
<td>-2.84 (16)</td>
<td>0.01</td>
</tr>
<tr>
<td>Initiative</td>
<td>3.58 (0.54)</td>
<td>3.74 (0.43)</td>
<td>-0.80 (17)</td>
<td>0.44</td>
</tr>
<tr>
<td>Negative experiences</td>
<td>1.33 (0.29)</td>
<td>1.27 (0.26)</td>
<td>0.53 (18)</td>
<td>0.60</td>
</tr>
<tr>
<td><strong>Basic Need Satisfaction in Relationship Scale</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>5.87 (0.86)</td>
<td>6.00 (0.96)</td>
<td>-0.34 (20)</td>
<td>0.74</td>
</tr>
<tr>
<td>Competence</td>
<td>6.18 (0.98)</td>
<td>6.42 (1.04)</td>
<td>-0.54 (20)</td>
<td>0.59</td>
</tr>
<tr>
<td>Relatedness</td>
<td>5.8 (0.80)</td>
<td>5.89 (0.96)</td>
<td>-0.24 (20)</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Table 11. ANOVA results table when comparing the group effects on the content of coach behaviours between able bodied athletes and athletes with disabilities.

<table>
<thead>
<tr>
<th>Coach Behaviour</th>
<th>df</th>
<th>$F$</th>
<th>$\eta_p^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>(1,2)</td>
<td>0.53</td>
<td>.023</td>
<td>.476</td>
</tr>
<tr>
<td>Technical instruction with modelling</td>
<td>(1,2)</td>
<td>5.35</td>
<td>.196</td>
<td>.030</td>
</tr>
<tr>
<td>Positive reinforcement</td>
<td>(1,2)</td>
<td>5.61</td>
<td>.203</td>
<td>.027</td>
</tr>
<tr>
<td>General communication</td>
<td>(1,2)</td>
<td>0.98</td>
<td>.043</td>
<td>.333</td>
</tr>
<tr>
<td>Coach-initiated athlete input</td>
<td>(1,2)</td>
<td>3.53</td>
<td>.138</td>
<td>.074</td>
</tr>
</tbody>
</table>