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Coaching age-group swimming: Contradicting perceptions and practices

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To the Graduate Council:

I am submitting herewith a thesis written by Samuel Dwyer Davy entitled "Coaching age-group swimming: Contradicting perceptions and practices." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Recreation and Sport Management.

Robin Hardin, Major Professor

We have read this thesis and recommend its acceptance:

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Accepted for the Council:

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

Coaching age-group swimming: Contradicting perceptions and practices

A Thesis Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Samuel Dwyer Davy

May 2017

Dedication

To my youth sport coaches, Randy Matsche, Justin Stoffel, Nick Hansen and Dan Quade, Mr. King, Mr. Wimme and Mr. Herzog, and Coach Burhite, Coach Peel and Coach Streveler.

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Lastly, and most importantly, I must thank my parents, Nadine and Timothy Davy. I would not be the man I am today without the love and support of my mother and father. They are the greatest role models, cheerleaders and teachers a son could ever ask for, and I will love you forever and always.

Abstract

The current study investigates coach's perceptions of sport specialization in age group swimming. Eleven swim coaches working with athletes under the age of 14 were interviewed. Despite the evidence in support of sport diversification over sport specialization, the study found coaches involved in youth swimming overwhelmingly support early sport specialization. This finding contradicts the literature. Three themes emerged: (1) support of sport sampling, (2) sacrifices connected to sport participation, and (3) coaches need for control. All 11 coaches acknowledged the role of other sports in the development of their athletes, but all 11 provided explanations as to why their athletes may not, or cannot, partake in other sports or general activities. Sacrifices connected to sport participation were discussed in all 11 interviews, and included both the loss of sport variety, and social sacrifices, often times connected to the same reasons athletes may not, or cannot, find time to participate in other activities. Eight of 11 participants suggested a need for control over their athletes, both in terms of their physical activities and spare time outside of school and sport. A possible explanation for these findings is many of these coaches work within programs designed and constructed to funnel athletes through the sport on the track of early sport specialization in hopes of achieving increased performances and accomplishing elite level swimming.

Keywords: sport specialization, coaching, swimming, sport diversification, development

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Key Terms

Sport specialization: (1) an athlete limiting participation to one sport which is practiced, trained for and/or competed in on a year-round basis (Hill & Simons, 1989; Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2012). (2) The point when an athlete's sports training and competition is restricted to, and focused upon, a single sport in the pursuit of elite performance (Capraria & Millard-Stafford, 2011).

Sport diversification: The participation in a variety of sports and activities through which an athlete develops multilateral physical, social, and psychological skills (Wiersma, 2000).

Age-group swimming: Competitive swimming for athletes aged 18 and under

Long-term athlete development (LTAD): A training system with the goal to construct a program where all youth sport participants flourish, based upon Balayi (1999) and Balayi and Hamilton (2004) where sustained success comes from training and performing well over the long-term, rather than winning in the short term. LTAD attempts to align training prescription with the timing and tempo of maturation as opposed to chronological age (Lloyd et al., 2015).

Developmental model of sport participation (DMSP): The Developmental Model of Sport Participation (DMSP) presents quantifiable and testable concepts about athlete development (Côté & Hancock, 2014). The three stages of the developmental model of sport participation are labeled as sampling years (age 6-13), specializing years (age 13-15), and investment years (age 15+) (Côté, 1999). The various stages of the DMSP are consistent with both sport-specific and general theories of child and adolescent development (Côté & Vierimaa, 2014).

Chapter 1: Introduction

In the United States, nearly 72% of school-aged youth, aged 6-17, participate in a minimum of one organized sport team or club (Myer et al., 2015). Organized sport plays a vital role in the development of children and youth (Fraser-Thomas, Côté, & Deakin, 2008). Widespread belief is sport participation, especially among youth, contributes to physical development (i.e., general fitness and enhancement of motor skills) and psycho-social development (i.e., increased self-confidence, self-image, and character development) (Harrison, 2016; Myer et al., 2015). Beneficial at times, the impact of sport is dependent on a variety of factors. For instance, the spectrum of youth (age 6-18) activity levels in the United States ranges from extreme inactivity to over activity in sport (Feeley, Agel, & LePrade, 2016). On the high end, youth participate year round in sport, and on the low end, medical issues related to weight gain take hold at an early age (Feeley et al., 2016). In combination with increased sport participation, researchers speculate sports specialization may be at an all-time high (Mostafavifar, Best, & Myer, 2013).

Sport Specialization and Sport Diversification

Sport specialization has been defined as an athlete limiting participation to one sport which is practiced, trained for and/or competed in on a year-round basis (Hill & Simons, 1989; Jayanthi et al., 2012). Sport specialization has also been defined as the point when an athlete's sports training and competition is restricted to, and focused upon, a single sport in the pursuit of elite performance (Capranica & Millard-Stafford, 2011). The expansion of sport specialization has occurred with controversy. Youth sport has evolved from child-driven, enjoyment-based, recreational free play to highly structured practices devoted to sports-specific skill development, driven by adult influences (Jayanthi et al., 2012).

Sport diversification exists in contrast to sport specialization. Sport diversification is the participation in a variety of sports and activities through which an athlete develops multilateral physical, social, and psychological skills (Wiersma, 2000). The premise of early sport specialization is a point of contention among researchers (Baker, 2003), particularly as sport diversification has been suggested to foster fundamental skills for lifelong involvement in a variety of sports, prolonged sport enjoyment and mixed social opportunities (Fraser-Thomas et al., 2008). One reason sport specialization thrives is the consistent link between quality of training and level of proficiency attained, but this focus on early sport specialization during developmental stages is linked to numerous negative consequences (Baker, 2003).

Burnout and Dropout. Burnout is described as withdrawal from an activity previously enjoyable to the participant due to stress or dissatisfaction (Smith, 1986). Burnout does not happen overnight, but develops over time (Malina, 2010). Typical reasons for dropping out among talented athletes is training programs overemphasize early specialization (Baker, 2003; Côté, Baker, & Abernathy, 2007). Malina (2010) found three primary factors involved in burnout: Negative performance evaluations, mixed messages and overtraining. In a 10 year retrospective investigation of drop out from competitive youth sport, researchers found during early stages of involvement lack of enjoyment was the most important reason for transfer to a different sport or withdrawal from sport altogether (Butcher, Lindner, & Johns, 2002). Barynina and Vaisekhovskii (1992) found swimmers who specialized early spent less time on the national team and retired earlier than athletes who specialize later. These elite swimmers who dropped out reported the main reasons for leaving the sport were psychological fatigue, general health and difficult loads (Barynina & Vaisekhovskii, 1992).

Physical Hindrances. In conjunction with negative consequences of physical burnout, other negative physical side effects exist due to early sport specialization, including limiting overall motor skill development (Malina, 2010; Wiersma, 2000), increased risk for injury (Feeley et al., 2016; Malina, 2010) and loss of transferable athletic skills (Hill & Simon, 1989). Wiersma (2000) speculated the limited range of skills executed during early sport specialization has the potential to limit overall motor skill development. Some researchers speculate this limited motor development may impact overall physical activity by decreasing the likelihood of participation in alternative physical activities during early life stages (Baker, 2003). Compounding the negative influence of sport diversity, and the lack of well-rounded athletic abilities, increased training associated with early sport specialization poses a threat to the physical health of youth athletes.

Research has associated sport specialization and sport injury through higher training volumes, potentially increasing risk for injury (Jayanthi et al., 2012). Increased training volume is often viewed as a necessity for athletes taking the path of sport specialization, causing overuse injuries. Overuse sport injury in youth athletes often relates to musculoskeletal and physiologic immaturity (Feeley et al., 2016). The muscles, ligaments, and bones of adolescents are not fully developed, leading to potential injury with repeated use (Feeley et al., 2016). The contradictory nature of increased volume of training and absence of complete physical development primes youth athlete for overuse injuries.

Psychological and Sociological Challenges. Multiple psychological and sociological challenges exist due to early sport specialization. The focus on a single sport, and the associated time commitment, may foster social isolation (Malina, 2010; Wiersma, 2000) and an overdependence on the athlete identity (Malina, 2010; Brustad & Ritter-Taylor, 1997). The time

commitment and focus on a single sport may increase isolation from peers, parents and family, especially during adolescence (Malina, 2010). Excessive training, one aspect of extreme time commitment, may substantially limit the time necessary for social growth, resulting in social isolation (Wiersma, 2000).

In conjunction with social isolation, overdependence on sport can lead to increased dependency on athletic identity. Within a team, social subcultures are established where members share similar values, beliefs and attitudes (Brustad & Ritter-Taylor, 1997). This shared world view leads athletes to identify with behaviors and expectations, basing their sense of self to the extent necessary to be accepted by other members of the group (Wiersma, 2000). These common practices among sport teams as a means of legitimizing an identity as a committed athlete can be harmful (Brustad & Ritter-Taylor, 1997). An athlete in a specialized sport may construct an even more narrow identity than multisport athletes because the necessity for those athletes to adhere to an exacting schedule (Brewer, Van Raalte, & Linder, 1993). A restricted identity may be detrimental in many ways, particularly if the athlete suffers a career-ending injury, is cut from a team, or retires from sport (Brewer et al., 1993).

Early Sport Diversification

The typical multi-sport athletes of the past are being replaced by finely trained specialized athletes (Hensch, 2006). In contrast to early sport specialization, early sport diversification postulates the first years of sport participation should be characterized by the involvement in different sports as well as a high amount of play-like practice focusing little on deliberate practice activities (Moesch et al., 2011). Wiersma (2000) defines sport diversification as the participation in a variety of sports, and activities through which an athlete develops multilateral physical, social, and psychological skills. The early sport diversification approach to

athletic opportunities provides athletes an environment to develop general athletic capabilities (Baker, 2003).

There is evidence linking early sport diversification and late sport specialization to benefits resulting in elite athletic performance (Moesch et al., 2011). This diversified approach, particularly in early stages, develops transferable athletic skills through the effects of cross-training in multiple sports and/or activities (Baker, 2003). For example, aerobic exercise, in any form, causes gross central adaptations at the onset of any physical training programs (Baker, 2003). This decreases over time, further supporting the notion of early sport diversification coupled with late sport specialization (Baker, 2003). The experience of sport sampling may support the growth of certain developmental outcomes, including increased intrapersonal skills, the development of prosocial behaviors and personal identity, the ability to connect with diverse peer groups and the accrue ment of social capital (Strachan, Côté, & Deakin, 2009). It can be reasoned that engaging in a variety of different sports allows the young athlete to experience different physical, cognitive, affective and psycho-social environments (Côté, Lidor, & Hackfort, 2009).

Sampling also provides an atmosphere promoting the development of intrinsic motivation (Côté et al, 2007), thus enhancing enjoyment; the strongest factor related to sport commitment and a positive indicator of the sport experience (Wiersma, 2000). This promotion of intrinsic motivation serves as the basis for self-regulated involvement in elite sport at a later stage (Côté et al., 2009). Baker (2003) also found the amount of time elite and non-elites spent training was not significantly different until after 18 years of age when elites dramatically increased their commitment to training. This dynamic relationship between early sport diversification and the

progression of both physical and intellectual skills begs the question: Why is early sport specialization is thriving?

Purpose of the Study

The purpose of this study is to examine age group swim coach's perceptions of sport specialization. This study looks to add to the research on sport specialization, particularly through the eyes of coaches by providing perspectives from coaches directly involved with athletes at the age where the decision to specialize versus sample is often decided. Coaches have a substantial influence on the experiences athletes with whom they interact (Greendorfer, 2002) and can offer support and guidance to athletes ultimately allowing for the formation of strong bonds (Jowett & Poczwardowski, 2007). This study bears great significance because of the potentially negative side effects of sport specialization, it is critical to understand what coaches perceive is important related to sport specialization.

Chapter 2: Literature Review

Growth of Specialization

Over 100 years ago, specialization resulted in excessive attention on a small number of athletes deflecting energy from the needs of the majority of men and boys who most needed the work (Fisher, 1912). Five years prior, Fisher discussed sport specialization and its morbid nature. Many extreme ideas have spread about the danger of specialization and premature death of athletes (Fisher, 1907). These early notions of sport specialization focus both on the impact of sport specialization on others involved, and the potential for extreme negative physical side effects. Fisher (1907) did go on to say these charges were extremely emotional in character, and of an unscientific nature. One response from the Young Men's Christian Association (YMCA) included the promotion of play and sport in the communities YMCA's were located (Fisher, 1912). Despite Fisher's own recognition of his statements being purely opinion, and not scientifically founded, it provides an interesting historical perspective.

Fast forward half a century, Novak (1976) discussed sport specialization within the context of play and the progressive loss of freedom exchanged for increased competitiveness and intensity. Gruneau (1983) viewed specialization in youth sports as a contributor to the elimination of the amateur code in athletics in favor of an approach built on capitalism and bureaucratic ethics. Both of these findings support the trend first identified in the early 1900s where sport specialization was recognized as a means to develop individual athletes and specific skills through the elimination of play in a variety of sports. Hill and Simon (1989) believed sport specialization by athletes at the high school level was a growing national trend, and specialization in youth athletics would occur at progressively earlier stages. The researchers explored the possibility of sport specialization as an irreversible trend, finding athletic directors

believed specialization, at the high school level, would increase and predicted its continuation over the next decade (Hill & Simon, 1989). Recently, sport specialization has continued its emergence in connection with societal trends: The privatization of youth sports, the development of unique ideas about parenting, and a focus on deliberate practice and the 10,000 hour rule.

Privatization of youth sports. In the past 50 years, youth sport has exchanged playgrounds, parks and public schools, for the world of private clubs and agencies (Stewart & Shroyer, 2010). Specialization in youth sports is a contributor to the elimination of the amateur code in athletics in favor of an approach built on capitalism and bureaucratic ethics (Gruneau, 1983). The exchange from playgrounds to private clubs and agencies is one way sport organizations sought to contribute to trend of sport specialization at an earlier age. Prior to 1954, most organized youth sport occurred within social agencies such as the YMCA/YWCA, Boys and Girls Clubs, and Boys Scouts and Girl Scouts (LeUnes & Nation, 1989). Since the 1950s, opportunities to participate in youth sports shifted from social agencies and activities organized by the youth themselves, to adult-organized programs (Seefeldt & Ewing, 1997). Seefeldt and Ewing (1997) believe the movement towards adult-organized sports activities for youth was associated with the advent of Little League Baseball growing from 70,000 participants in 1954 to 2.5 million in 1989. At a minimum, this explosive growth is an indicator of the change of culture around youth sport.

This rift between private organizations and public entities through the middle of the 20th century is related to physical educators fighting to pass legislation condemning overspecialization, overemphasis on competition and poor coaching provided by parents of team members (Harrison, 2016). Instead of legislation restricting the growth of overspecialization, competition and poor coaching, legislation for private organization came from an unlikely

source. Coakley (2015) cites emerging cultural beliefs of the 1980s where government was a problem, not a solution. As a result, park and recreation departments received less funding, and from the mid-1980s through the mid-1990s, park and recreation departments could no longer maintain public youth sport programs (Coakley, 2015; Harrison, 2016). In reaction to changing times, these departments were confronted with the reality of finding new sources of income. Instead of providing the full array of sports, departments issued permits to rapidly emerging private programs to exploit their vacant facilities and increase revenues (Coakley, 2015). It is interesting to note, youth desire for freedom to play outside of organized youth sport organizations was seen in the increase in extreme and alternative sports such as skateboarding, inline skating, and snowboarding, all experiencing marked advances in participant numbers (600% increase since 1990) during this time period (Harrison, 2016). Despite youth looking to alternative options, private sport organization grew through the mid-2000s, resulting in the modern youth sport organizations. Although most adults were well intentioned, the explosion of youth sport organizations impacted the dynamic of families and their fiscal dependency on youth sport. Teams run by parents and families members of sport participants inevitably lead to year-round membership dues and participation becoming essential for the future success of children and families, both economically and socially (Coakley, 2015). The ensuing marketing and selling of youth sport specialization focused attention on success stories, resulting in longer seasons, demanding schedules, year-round participation and travel, and the growth of early sport specialization (Coakley, 2015).

These youth sport organizations rely on a pyramidal membership with a broad base populated by beginners, often as young as 5-years old with families motivated by low organizational activities, and a focus on fun and participation (Stewart & Shroyer, 2010).

Beginner programs cast a wide net in search of potential families to become staples within the program. Eventually adults within these families volunteer as coaches, initiate additional competitive experiences, increase scheduled practices, and document game results (Stewart & Shroyer, 2010). As the competitive atmosphere intensifies the pressure to commit to the sport for extended periods of time increases (Stewart & Shroyer, 2010). The rationale for this increased practice periods, intensity of training and extended seasons stems from an assumption where optimal sport performance is achieved after prolonged periods of practice (Seefeldt & Ewing, 1997). At some point, paid coaches from upper levels of the pyramid offer off-season camps and traveling teams (Stewart & Shroyer, 2010). Potentially, by the age of 12, youth athletes may have participated for as long as seven years in a structured, specialized sport environment. From the growth of Little League Baseball, through the governmental changes in the 1980s, youth sports were almost completely transformed in a generation.

Ideas about parenting. The 1980s not only brought legislation reducing public funding of park and recreation departments, but also introduced an increased emphasis on individualism and personal responsibility, shaping ideas about what constituted good parenting (Coakley, 2015). Rooted in a middle-upper class value system, a culture of involved and intensive fathering and mothering parenting principles emerged with potential connections to youth sport (Trussell & Shaw, 2012). The primary trend is a parent's moral worth may be evaluated by their children's successful participation in sport (Trussell & Shaw, 2012). The reason for assessment may have resulted from the inclination where, for the first time in history, parents were entirely responsible for the whereabouts and actions of their children at all times (Coakley, 2015). Through this cultural shift, the moral worth of parents became linked to the actions and achievements of their children more than ever (Coakley, 2015).

Trussell and Shaw (2012) found the high value and significance of children's participation in organized sport opportunities as it related to being a good parent. Moreover, the analysis of parental dialogue discovered parenting extended beyond the household environment, becoming a public act observable by other parents, creating the basis of what was deemed to be good parents (Trussell & Shaw, 2012). Some parents developed ambivalent feelings towards their child's youth sport experiences. This is expressed by bragging and complaining about the time and energy devoted to nurturing the sport achievements of their children proving moral superiority, while other parents explained their commitment in terms of the benefits they expected their child to gain from sport participation (Coakley, 2006). Trussell and Shaw (2012) found three main themes reflecting parental perspectives: (a) paying a high price to play, (b) judging other parents and (c) maintaining the gendered ideal, with a core theme of parenting in private and public spaces emerging.

In connection with parental expectations and return on investment, extreme cases of parental sport sponsorship have become heralded as the epitome of parental success. When Shawn Johnson's parents put an additional mortgage on their home to continue nurturing Johnson's Olympic gymnastics dreams, NBC commentators identified them as ideal parents (Coakley, 2015). The story of Shawn Johnson is far from unique in the sport of gymnastics, as 2012 and 2016 Olympian, Gabrielle Douglas, moved across the country to train at a gymnastic gym when Gabrielle was age fourteen (Douglas, 2016). Olympic skier Lindsey Vonn began her athletic career early, enjoying early success (Stewart & Shroyer, 2010). Her career caused significant family upheaval when, at age 11, she and her mother permanently moved to Colorado to train while her two brothers and sisters remained in Minnesota with their father (Stewart & Shroyer, 2010). In the sport of swimming, Michael Phelps, the most decorated Olympian of all-

time, specialized early and reaped many rewards, catapulting his mother into the national spotlight with interviews, book deals, and a constant camera feed during his nationally televised events (Stewart & Shroyer, 2010). The role and influence of parents and media are undeniable in the growth on sport specialization. One avenue the media has interjected itself into the narrative of sport specialization is through the self-help books on deliberate practice, 10,000 hours, and what it takes to become elite.

Deliberate practice and 10,000 hours. Malcolm Gladwell, the bestselling author of *Outliers: The Story of Success* (2008) popularized the “10,000 hours” rule for achieving elite performance in a particular skill set. This theory was originally proposed for musicians but has been extrapolated across multiple fields, including athletics (Feely et al., 2016). Ericsson, Krampe and Tesch-Romer (1993), in their seminal study of German music students speculated early specialization and deliberate practice enabled individuals to achieve elite status in their given discipline. Deliberate practice is defined by Ericsson et al. (1993) as “effortful practice, lacking inherent enjoyment, done with the sole purpose of improving current levels of performance” (p. 368). The researchers found deliberate practice to be essential in producing elite performance. Ericsson et al. (1993) proposed three stages in becoming an elite musician: (1) Start at an early age, (2) specialize and increase participation, and (3) dedicate full-time commitment. The culmination of these stages results in the accumulation of an average of 10,000 hours of deliberate practice (Ericsson et al., 1993). The combination of this study, and *Outliers* (Gladwell, 2008), has given life to the notion of early specialization and the importance of training early and intensely. Ericsson et al. (1993) found the differences between elite and non-elite performance attributed to a life-long dedication to deliberate practice in a specific

domain. In this model, opportunities to achieve at an elite level diminish when early specialization is lacking.

This dependency on early versus late specialization exists because the accumulation of hours of deliberate practice must coincide with crucial periods of biological and cognitive development (Baker, 2003). This means students who exceed 10,000 hours of training later in life may not receive similar training adaptations to those who begin earlier in life. In an alternative study of musicians deliberate practice explained approximately 30% (on average) of the reliable variance in performance (Hambrick et al., 2013). This leaves roughly 70% of performance variables explainable by other factors, meaning deliberate practice does not explain all, nearly all, or even most of the variance in performance (Hambrick et al., 2013). Researchers found a multitude of other factors to consider in conjunction with deliberate practice, including starting age, intelligence, personality and genes (Hambrick et al., 2013). The debate over why and how some people become elites while others fail is a topic of intense debate in psychology, raging for well over a century, and will remain so for many years to come (Hambrick et al., 2013). Regardless of the limitations of the 10,000 hour rules and deliberate practice, these ideas churn through sport society thanks to literary work on elites, feed the sport specialization opinions, and continue to be the topic of discussions and research.

Early Sport Specialization

Sport specialization, specifically early sport specialization, has been defined as an athlete limiting participation to one sport which is practiced, trained for and/or competed in on a year-round basis (Hill & Simons, 1989; Jayanthi et al., 2012). A separate study defined sport specializations as the point in an athlete's sports training and competition restricted to and focused upon a single sport in the pursuit of elite performance (Capranica & Millard-Stafford,

2011). The growth of this phenomenon has occurred with controversy. Youth sports has evolved from child-driven, enjoyment based, recreational free play, to highly structured practices devoted to sports-specific skill development, driven by adult influences (Jayanthi et al., 2012). During the past two decades, the shift from youth-driven recreational sports activities to parent and coach-driven skill development with an emphasis on a single sport has gained significant momentum (Feeley et al., 2016). There are positive and negative side effects when adhering to the restriction of participation to a single sport at a young age. The premise of early sport specialization in the development of sport elite performance is a point of contention among researchers (Baker, 2003).

Positives of early sport specialization. There is a wealth of evidence supporting the early specialization approach (Baker, 2003). The earlier one begins focused training the greater chance of achieving exceptionally in their chosen domain (Ericsson et al., 1993), and there is general agreement the number of hours spent in deliberate practice and training positively correlates with the level of achievement in both individual and team sports (Jayanthi et al., 2012). This means not only deliberate practice in the short term, but extensive hours during a span of several years result in subsequent elite performances. Studies with musicians indicate the difference between elites and non-elite is due to the amount of time spent in deliberate practice (Ericsson et al., 1993). In a study of two groups of rhythmic gymnasts, one elite and the other sub-elite, researchers found intense training began at similar ages, but elites were involved in fewer activities from ages 4-16, accumulating more hours of training by age 16 (Law, Côté, & Ericsson, 2007). Studies also found elites to have greater task-specific knowledge, store and access information more effectively (McPherson, 1993), pick up advance information earlier, use situational probability data better than novices (Abernathy & Russell, 1987), make decisions

more rapidly, and more appropriately (Williams, 2000). Research has grown during the past two decades, coinciding with the explosion of specialized athletes at younger and younger ages, seeking the elite status required to achieve at the highest levels. As the trend grew, research on the negative side effects did as well.

Negative consequences of early sport specialization. While there is consistent evidence linking quality training with level of proficiency attained, a focus on specialized training during earlier stages of development have been linked with several negative consequences (Baker, 2003). These negative consequences include burnout and dropout, physical hindrances, and psychological and sociological challenges.

Burnout and dropout. Burnout is described as withdrawal from previously enjoyable activity due to stress or dissatisfaction (Smith, 1986). Physical burnout (Feeley et al., 2016; Hill & Simon, 1989; Malina, 2010; Wiersma, 2000), psychological burnout (Hill, 1989; Malina, 2010; Wiersma, 2000) and sport dropout (Baker, 2003; Malina, 2010) have all been linked to sport specialization. Burnout does not happen overnight, but develops over time (Malina, 2010). A typical reason for dropping out among talented athletes is training programs focus on early specialization (Baker, 2003; Baker, Côté & Abernathy, 2007). In a ten year retrospective investigation of drop out from competitive youth sport, researchers found during early stages of involvement, lack of enjoyment was the most important reason for transfer to a different sport or withdrawal from sport altogether (Butcher et al., 2002). Much of the youth sport dropout research has been framed within motivation theories, with the most commonly cited reasons for withdrawal being conflicts of interest, and negative experiences such as lack of fun and playing time and coach conflicts (Fraser-Thomas et al., 2008). Malina (2010) found three primary factors involved in burnout: Negative performance evaluations (critical rather than supportive,

inconsistent feedback from coaches and officials), mixed messages and overtraining. Barynina and Vaisekhovskii (1992) found swimmers who specialized early spent less time on the national team and retired earlier than athletes who specialize later. These elite swimmers who dropped out reported the main reasons for leaving the sport were psychological fatigue, general health and difficult loads (Barynina & Vaisekhovskii, 1992).

Physical hindrances. In conjunction with the negative consequences of physical burnout, other negative physical side effects exist due to early sport specialization. These include limiting overall motor skill development (Malina, 2010; Wiersma, 2000), increased risk for injury (Feeley et al., 2016; Malina, 2010) and loss of transferable athletic skills (Hill & Simon, 1989). Wiersma (2000) speculated the limited range of skills executed throughout early sport specialization has the potential to limit overall motor skill development. This may impact long-term physical activity involvement by decreasing the likelihood of participation in alternative physical activities during early life stages (Baker, 2003). In a study of rhythmic gymnasts, researchers found elites were involved in fewer activities from age 4-16 and accumulated more hours of training by age 16, but also rated their health as lower than sub-elites, and experienced less fun in their overall participation (Law et al., 2007). Compounding the negative influence of sport diversity and a lack of well-rounded athletic abilities, the increased training associated with early sport specialization poses a threat to the physical health of youth athletes. A study of 519 US Tennis Association junior tennis players found 70% began specializing at an average age of 10.4 years old but were more likely to have reported previous injury and players who suffered an injury have a significantly higher risk of future tournament medical withdrawal (Jayanthi et al., 2011). Research has associated sport specialization and sport injury through higher training volumes, potentially increasing risk for injury (Jayanthi et al., 2012). Increased training volume

is often viewed as a necessity for athletes taking the path of sport specialization, causing overuse injuries. Overuse sport injury in youth athletes often relate to musculoskeletal and physiologic immaturity (Feeley et al., 2016). The muscles, ligaments, and bones of adolescents are not fully developed, leading to potential injury with repeated use (Feeley et al., 2016). The contradictory nature of increased volume of training and absence of complete physical development primes youth athlete for overuse injuries.

Psychological and sociological challenges. Two psychological and sociological challenges exist due to enrollment in early sport specialization. A singular sport focus, and the associated time commitment, may foster social isolation (Malina, 2010; Wiersma, 2000) and an overdependence on the athlete identity (Brustad & Ritter-Taylor, 1997; Malina, 2010). The time commitment and focus on a single sport may increase isolation from peers (age and sex), parents and family, especially during adolescence (Malina, 2010). Excessive time training, an aspect of extreme time commitment, may substantially limit the time necessary for social growth, resulting in social isolation (Wiersma, 2000). In conjunction with social isolation, overdependence on sport can lead to increased dependency on athletic identity. Within a team, social subcultures are established where members share similar values, beliefs and attitudes (Brustad & Ritter-Taylor, 1997). This shared world leads athletes to identify with behaviors and expectations, basing their sense of self to the extent necessary to be accepted by other members of the group (Wiersma, 2000). These common practices among sport teams as a means of legitimizing an identity as a committed athlete can be harmful (Brustad & Ritter-Taylor, 1997). An athlete in a specialized sport may construct an even more narrow identity than multisport athletes because the necessity for those athletes to adhere to an exacting schedule (Brewer et al., 1993). A restricted identity may be detrimental in many ways, particularly if the athlete suffers a career-ending injury, is cut

from a team, or retires from sport (Brewer et al., 1993). In opposition of early sport specialization, research points to the diversification of sports through the early years, into the development years.

Sport Diversification

The multi-sport athletes of the past may have benefitted in a variety of ways not easily recognized when compared to the specialized athletes found in sport today. Early sport diversification postulates the first years of sport participation should be characterized by the involvement in different sports as well as a high amount of play-like practice focusing little on deliberate practice activities (Moesch et al., 2011). Wiersma (2000) defines sport diversification as the participation in a variety of sports and activities through which an athlete develops multilateral physical, social, and psychological skills. There is evidence linking early sport diversification with late sport specialization and the benefits resulting in elite athletic performance (Moesch et al, 2011). Baker (2003) found the amount of time elites and non-elite spent training was not significantly different until after 18 years of age when elites dramatically increased their commitment to training. Additional studies demonstrate some athletes with diversified sport backgrounds who engaged in deliberate play during childhood still reached an elite level in sport (Baker, Côté, & Abernathy, 2003; Baker, Côté, & Deakin, 2005; Soberlak & Côté, 2003). Research suggests engaging in a variety of different sports allows the young athlete to experience different physical, cognitive, affective and psycho-social environments (Côté, Lidor, & Hackfort, 2009). This experience of sport sampling may support the growth of certain developmental outcomes, including increased intrapersonal skills, the development of prosocial behaviors and personal identity, and the accruelement of social capital (Strachan et al., 2009; Wilkes, MacDonald, Horton, & Côté, 2009). In addition to these cognitive developmental

outcomes, research has found sport diversification as a means to increase physical activity and sport participation throughout life and promote the growth of well-rounded athletic abilities.

Increased life skills. One outcome of sampling sports is an increased set of life skills. Life skills are defined as attributes or abilities contributing to an individual's success in various social environments (Danish, Nellen, & Owens, 1996). These skills consist of intrapersonal skills (time management) and interpersonal skills (communication, leadership), both being developed through sport programs (Wilkes et al., 2009). In their study of 11th grade students, Fredricks and Eccles (2006) found participation in both high school clubs and sports predicted academic adjustment, psychological adjustment, and educational status, with the breadth of activity associated with indicators of adult adjustment. These studies have also found those involved in a variety of extracurricular activities (e.g. sports, volunteer, arts) score more favorably on outcome measures such as grade point average and positive peer relationships than youth who participate in fewer activities (Fredricks & Eccles, 2006).

Development of prosocial behaviors and personal identity. Past studies suggest youth who participate in a number of different activities report higher levels of positive peer relationships than youth who participate in fewer activities (Fredricks & Eccles, 2006). Furthermore, the National Research Council and Institute of Medicine (NRCIM) (2002) suggest the social norms children are exposed to early in life have long-lasting effects, often into adulthood. The reinforcement of norms, such as respect and academic achievement in multiple social venues, was proposed by the NRCIM as critical to helping children grow into healthy and productive citizens (Wilkes et al., 2009). Sampling is a strategy to help ensure children are exposed to prosocial norms in multiple programs, a situation specialized youth athletes may not experience (Wilkes et al., 2009). Within a group, such as a sport team, social subcultures are

established where participants share similar values, beliefs and attitudes (Brustad & Ritter-Taylor, 1997), allow members to develop a holistic understanding of other world views, and adopt values of the group. Sampling encourages identity exploration by exposing children to different environments which provide opportunities to decide the level at which they wish to participate (Wilkes et al., 2009). In addition to the identity exploration and developing positive peer relationships, extracurricular activities have also been linked to lower levels of risky behavior during the high school years than their non-involved peers (Eccles & Baber, 2003).

Accrue ment of social capital. Research indicates sport experiences foster citizenship, social success, positive peer relationships and leadership skills (Wright & Côté, 2003). Social capital includes the relationship between youth, their parents, other adults, and the community (Smylie, Medaglie, & Maticka-Tyndale, 2006). Given the fact samplers are in contact with significantly more coaches across seasons and careers, social capital may be more easily nurtured in their experiences (Strachan et al., 2009), and children involved in multiple sports have the opportunity to garner social capital through developing relationships with a wider range of adults than youth involved in only one activity (Wilkes et al., 2009). Samplers have more experiences related to the integration of sport and family, and also between community and sport (Strachan et al., 2009).

Increased physical activity and sport participation. With obesity and associated disease on the rise, the importance of physical activity as a means of fostering positive youth development has gained considerable attention among researchers (Fraser-Thomas, Côté, & Deakin, 2005). Given physical activity habits developed during youth are associated with physical activity in adulthood (Robertson-Wilson, Baker, Derbyshire, & Côté, 2003), active youth are less likely to develop numerous diseases later in life (Robertson-Wilson et al., 2003;

Wilkes et al., 2009). Physically active and inactive adult females who sampled numerous sports and physical activities in childhood were found to be more physically active during adulthood (Robertson-Wilson et al., 2003). This sampling also provides an atmosphere promoting the development of intrinsic motivation (Côté et al., 2007), enhancing enjoyment; the strongest factor related to sport commitment and a positive indicator of the sport experience (Wiersma, 2000). Sampling a variety of sports may also provide enjoyable experiences for young athletes and potentially foster motivation to continue in sports throughout development and later in life (Wilkes et al., 2009). This promotion of intrinsic motivation serves as the basis for not only self-regulated involvement in elite sport at a later stage (Côté et al., 2009), but also continued physical activity into later life stages (Robertson-Wilson et al., 2003). In addition to these motivational factors, sampling may also promote prolonged engagement in sport by limiting physical injuries (Fraser-Thomas et al., 2005).

Growth of well-rounded athletic abilities. The sport diversification approach, particularly in early stages, develops transferable athletic skills through the effects of cross-training in multiple sports and/or activities (Baker, 2003). For example, aerobic exercise, in any form, causes gross central adaptations at the onset of any physical training programs, but this affect decreases over time (Baker, 2003). In a study of rhythmic gymnastics, researchers found all gymnasts participated in other sports, with no difference between elites and sub-elites (Hume, Hopkins, Robins, Robinson, & Hollings, 1994). Carlson (1988), in his study of elite tennis players, found elite players began intense training and specialized later than near elites (after age 13-15 compared to age 11). Gullich and Emrich (2006) studied 1558 German athletes in Olympic sports and found elite athletes began intense training and competition in their sport later than near-elites, and more elites participated in a variety of sports after age 11. In their study of

63 elite and 78 near elite Israeli athletes, Lidor and Lavyan (2002) found elites to be more likely than near-elites to begin intense training after age 12 and to have played more than one sport during developmental years. A study of 148 elite and 95 near elite athletes involved in centimeters, grams or seconds sports, found elite athletes began intense training at a later age compared with near-elites, and near-elites accumulated more hours of training by age 9, 12, and 15 than elites, while elites accumulated more training by age 21 than near elites (Moesch et al., 2011).

When considering the dichotomy of early specialization and sampling, it is apparent both approaches can lead to elite performance under optimal conditions (Wilkes et al., 2009). Problems arise when comparing the side effects of early sport specialization with early diversification. It should also be noted only a small percentage of children who participate in school sports ever become elite athletes, and the goal of early sport participation should not be limited to the development of high-level athletes, especially in school sport programs (Wilkes et al., 2009). Therefore, a child choosing an early sport specialization route is balancing both the increased risks associated with early sport specialization and the small possibilities of becoming an elite athlete.

Specialization and Swimming

Specialization in swimming has the potential to directly impact USA Swimming (the national governing body in the United States) through its influence on the development of young swimmers. Malina (2010) found swimming to be riddled with early specialization. The median age swimmers specialized was 10, the youngest of the seven sports surveyed (swimming, diving, tennis, golf, basketball, volleyball, track and field) (Malina, 2010). Barynina and Vaisekhovskii (1992) found elite swimmers who specialized before 11 years of age spent less time on a national

team and retired earlier than late specializers. In a study of youth swimmers who competed internationally prior to their junior year of high school, the researchers found the number of athletes fell from 60 to 18 in a three year span (Barreiros, Côté, and Fonseca, 2012). These findings call to question the direction of the sport of swimming, and why early sport specialization has taken hold of the sport despite a lack of long term success.

One reason specialization in swimming may start around the age of 10 may be attributed to USA Swimming posting national rankings for age group swimmers starting at the age of 10. Providing 10 year old swimmers and their families a perspective on where they fall in the national rankings may place unnecessary pressure to perform at a national level. In conjunction with these findings, USA Swimming (2016) membership demographics show retention rates drop after the age of 12, with a steep drop from the age of 14 to 16. These dropout rates fall in line with increases in specialization, followed by expansion of training volume and time commitment. There are a variety of reasons the myths of early sport specialization have been perpetuated, and they are often passed on by the support cast involved in youth athletics, particularly sport coaches.

Role of Coaches

One can make the argument the strongest influence in a young athlete's life, outside of their parents, is their coach (Wolfenden & Holt, 2005). At some point during a young athlete's career, the person with the greatest influence on the sports decisions shifts from parents to coaches (Fraser-Thomas et al., 2008). Parents generally progress from a leadership role during early years, to a following and supporting role during the later years (Fraser-Thomas et al., 2008). In the early stages of an athlete's career, youth athletes described coaches as focused on opportunities to move, be engaged, and learn fundamental skills, developing the foundation for

complex sport skills later in life (Côté & Hay, 2002). Athletes further develop relationships with their coaches at approximately age 13 and, simultaneously, become more technical and serious regarding their athletes' involvement in practice and training (Côté & Hay, 2002).

Coaching and specialization. In their study of elite junior tennis players, researchers found parents and athletes to have a great deal of respect for their coaches, and coaches had effective working alliances with the children (Wolfenden & Holt, 2005). A survey of elite young athletes found parents were the strongest influence of the initiation of sport (Baxter-Jones & Maffulli, 2002). In contrast to parents providing the choice to play sports, coaches may encourage children to begin focusing on their sport. This is supported by Baxter-Jones and Maffulli (2002) who found coaches were the strongest influence on their decision to perform intense training. In this study, parents introduced their child to athletics, while coaches pushed them to specialize and train intensely. High parental expectation for athletic success was considered a contributing factor to youth sport specialization by 77% of parents surveyed (Hensch, 2006). Interestingly, in the same study, despite pressure from coaches being noted by more than 60% of parents as contributing to specialization, of those, 54% wanted their children to play for coaches who promote diversification rather than specialization (Hensch, 2006). These studies point to parents pushing their children towards specialization after coaches insist on specialization, but in reality, the parents want their children to diversify.

As displayed, coaching opinions on sport specialization and participation appear to play a significant role in decision-making of the families involved in youth sports. A coach with the intention of pushing their athlete to reach elite levels may value volume of training but lose the quality of focus involved. The most critical element influencing athlete outcomes is the planning capabilities of the coach (Brylinsky, 2010). A coach who focuses on athletes increased

participation may miss the larger picture. Effective planning in both specialized and multisport training models should focus athletes' attention on what they need to do better and what is limiting their performance (Brylinsky, 2010). Oversights by coaches may contribute to mismanagement of youth athletic careers due to increased influence over the decisions of families begs the questions: How have coaching roles evolved, and where is the rightful place for coaches within the coach-athlete-parent paradigm?

Forms of sport coaching. The coach's role, and how it grows and develops, is one of the most explored areas of youth sport research (Fraser-Thomas et al., 2008). An important issue within the research is how elite athletes spend practice time; further highlighting the role a coach plays setting up optimal learning conditions (Côté & Hay, 2002). As discussed, sport has changed, becoming more professionalized, leading to changing roles of coaches (Côté, Young, North, & Duffy, 2007). As these roles evolve so must the understanding of what constitutes "good" coaching (Bowes & Jones, 2006; Côté et al., 2007a). Distinction in coaching is more than simply winning, achieving standards, and the degree of mastery during training sessions (Mallett & Côté, 2006). Excellence must be judged by how coaches employ knowledge, and demonstrate behavioral and social competencies while interacting with athletes (Côté et al., 2007b). These correlates of quality (i.e., knowledge and competence) have been difficult to generalize considering research on coaching excellence focuses on fairly small numbers of individuals (Côté et al., 2007b). Excellence in coaching needs to be understood in line with contextual factors influencing decisions and behaviors (Côté et al., 2007b).

In addition to the contextual factors, there are two distinct forms of sport coaching based on the competitive level of the athletes: Participation coaching and performance coaching (Lyle, 2002). Participation coaching involves a smaller emphasis on competition, and the performances

of participants are less engaged in the sport (Côté et al., 2007b). Performance coaches commit to preparation for competition and programming to influence performance variables (Côté et al., 2007b). This preparation means a higher degree of specificity in the program delivered to the athletes. The distinction between participation and performance coaching is dictated by the focus, or lack of focus, on organized competition. Lyle (2002) contended each form of coaching is very different, raising a number of issues with respect to matching individual coaches to athlete needs. Participation coaches work within sampling and recreational years, while performance coaches include specialization and investment years (Côté et al., 2007b). These categories are derived from the Developmental Model of Sport Participation, which highlights the importance of training patterns and competitive environments developmentally appropriate for three distinct age stages (6-12, 13-15, 16+) (Côté, 1999; Côté et al., 2007a). From 6-12 years of age, recreational participation and elite performance athletes have the same foundation, called the sampling years, followed by the decision to either stay involved in sport at a recreational level or embark on a path focusing primarily on competitive performance over two subsequent stages (Côté et al., 2007a). These stages will be further expanded upon within the theoretical framework.

Participation coaches must be mindful of broader organizational roles, ensuring a youth athlete is not engaged in one sport for more than four hours a week (Côté et al., 2007b). It is important to discourage parents from entering children in one sport on a year-round basis as well (Baker et al., 2003; Côté, 1999). Performance coaches must arrange training, and competitive and organizational elements in accordance with athletes' needs (Côté et al., 2007b). This programming would include any skills required to improve during competitive performances. Performance coaches should be found in the specialization years, after the age of thirteen, and

encourage athletes to specialize by focusing on one sport on a year-round basis (Côté et al., 2007b).

Coaching and swimming. As the scope of this study targets youth swimmers, aged 14 and under, the literature on both the age and sport are of increased importance. Coatsworth and Conroy (2009), in their study on the of competitive swimming coaches, found coaches who provided information about performance, coupled with praise or encouragement, had athletes who experienced more enjoyment and had a greater preference for a challenge. It was the praising autonomous behavior that predicted youth satisfaction (Coatsworth & Conroy, 2009). Another study of competitive swimmers found those who persisted in swimming perceived their coaches as more autonomy-supportive, while those who withdrew perceived their coaches as more controlling (Pelletier, Fortier, Vallerand, & Briere, 2001). Fraser-Thomas et al. (2008), in their study of adolescent competitive swimmers, found participants in swimming were exposed to deliberate practice from a very young age, suggesting this form of training may be innate within the structure of competitive swimming. Individual receptiveness to early deliberate practice training is likely dependent on numerous factors, such as commitment, determination, and social maturity, but training related findings may also help explain why some athletes responded more positively (Fraser-Thomas et al., 2008). For example, clubs' developmental approaches, which involved limiting training volume, delaying dry land training and training camps, and promoting the development of life skills, may have provided less rigorous and more age-appropriate styles of deliberate practice (Fraser-Thomas et al., 2008). Coaches often convince their athlete year-round commitment is necessary for success in their sport, delayed dry land training and training camps may lead to fewer physical and psychological costs, given the risks associated with early specialization (Hecimovich, 2004). Fraser-Thomas et al. (2008) did

recognize the teaching of life-skills may facilitate athletes' capability to be involved in other activities outside swimming. In order to frame these research findings within development, the following theoretical framework will view sport specialization through two models: Long-Term Athlete Development and the Developmental Model of Sport Participation.

Theoretical Framework

Long-term athlete development. The number of youth athletes who can expect to successfully develop through grassroots youth to professional sport is relatively small (Lloyd et al., 2015). Consequently, it would seem intuitively naïve to overlook the potential benefits of long-term athletic development as a pathway to enhance health, fitness, and performance of all children and adolescents (Lloyd et al., 2015). In the long-term athlete development model (LTAD), the goal is to construct a system where all youth sport participants flourish. Ultimately, sustained success comes from training and performing well over the long-term, rather than winning in the short term (Balayi & Hamilton, 2004). Developing talent within sport is an important, valued and rewarding process for athletes and coaches alike, but structure, progression and integration are paramount in the development of a pathway for youth of all ages and abilities (Lloyd et al., 2015). The LTAD attempts to align training prescription with the timing and tempo of maturation as opposed to chronological age (Lloyd et al., 2015). Balayi and Hamilton (2004) suggested using Peak Height Velocity (PHV) as a reference point for the tempo of maturation with relation to periods of trainability during the maturation process. The onset of PHV is a valuable reference point for training energy systems and central nervous systems regardless of chronological age (Balayi & Hamilton, 2004). When considering the stages, ages provided are general guidelines but the individual development and maturation will influence how athletes reach various stages (Balayi, 2001; Balayi & Hamilton, 2004). In the beginning

stages of the LTAD, it encompassed a five-stage event (Balayi, 2001), but as years passed, Balayi and Hamilton (2004) updated the model to include a sixth stage.

Stage 1 - The FUNdamental stage. The first stage is categorized as males age six to nine and females age six to 8-years old (Balayi, 2001; Balayi & Hamilton, 2004). The primary objective is to learn all fundamental movement skills (Balayi & Hamilton, 2004). There are three steps within the first stage, known as initial (2-3 years), elementary (4-5 years) and mature (6-7 years) (Balayi & Hamilton, 2004). This phase should be well structured, but should also be fun, and participation in as many sports as possible is encouraged (Balayi, 2001; Balayi & Hamilton, 2004).

Stage 2 - The learning to train stage. This stage encompasses males aged nine to 12 and females aged eight to 11 years (Balayi & Hamilton, 2004). The chief objective is to learn fundamental sport skills and building overall sport skills (Balayi, 2001; Balayi & Hamilton, 2004). The recommended training to competition ration is 70 to 30 however these percentages vary according to sport and individual needs (Balayi, 2001; Balayi & Hamilton, 2004). Athletes do play to win and work to do their best, but the primary goal is to learn the basics.

Stage 3 - The training to train stage. The third stage includes males age 12-16 and females 11 to 15 (Balayi & Hamilton, 2004). The primary objective is to build the aerobic and strength base, and further develop sport-specific skills (Balayi & Hamilton, 2004). During competitions athletes play to win and do their best, but the major focus is learning basics (Balayi & Hamilton, 2004). The practice to competition ratio recommended is 60 to 40%, with the 40% including competition specific training (Balayi & Hamilton, 2004). This stage addresses the critical, or sensitive, periods of physical and skill development (Balayi, 2001; Balayi &

Hamilton, 2004). Athletes who miss this stage of training will never reach their full potential regardless of remedial programming (Balayi, 2001; Balayi & Hamilton, 2004).

Stage 4 - The training to compete stage. The fourth stage includes males age 16 to 18 and females aged 15 to 17 (Balayi & Hamilton, 2004). This phase is introduced after goals and objectives of training to train stage are met (Balayi, 2001; Balayi & Hamilton, 2004). The competition to practice ratio shifts to 50-50 and high intensity, individualized, sport specific training is provided to athletes year round (Balayi, 2001). Special emphasis is placed on optimum preparation by modeling training and competition, with individual preparation addressing each athlete's individual strength and weaknesses (Balayi, 2001).

Stage 5 - The training to win stage. This is the final stage of athletic preparation and includes males 18 and older and females 17 and older (Balayi, 2001; Balayi & Hamilton, 2004). All of the athlete's capacities are fully established and the focus of training shifts to optimal performance through training to peak at major competitions (Balayi, 2001; Balayi & Hamilton, 2004). Training to competition ratio is shifted to 25 to 75 (Balayi, 2001).

Stage 6 - The retirement / retraining stage. This stage refers to the activities performed after an athlete has retired from competition (Balayi, 2001; Balayi & Hamilton, 2004). Former competitive athletes may transition into sport related careers (Balayi, 2001; Balayi & Hamilton, 2004).

Additions to LTAD. Since the inception of the LTAD model in the 1990s and early 2000s, additional stages have been added to the model. Swimming/Natation Canada (2008) has adopted the LTAD plan, and instituted additional steps at the start and the end of the LTAD. The active start was added at the beginning, representing the first stage where children (up to the age of six) are provided with an active start to their life (Swimming/Natation Canada, 2008). The

goal is to introduce physical activity in a fun and safe environment, developing brain function, coordination, social skills, gross motor skills, emotions, leadership, and imagination (Swimming/Natation Canada, 2008). In conjunction to the active start, active for life is a final step included in Swimming/Natation Canada (2008) program. This stage is important as it considers complimentary activities to continue competitive activity, implements active lifestyle plans for de-training process, and lifestyle refinement post competitive training (Swimming/Natation Canada, 2008).

Criticism of LTAD. A primary criticism of the LTAD model is its adoption of the 10,000-hour rule previously introduced (Lloyd et al., 2015), as well as the lack of research around the LTAD (Côté & Hancock, 2014). The recommendation of 10,000 is based upon Ericsson et al. (1993) research with musicians, and the idea of deliberate practice in order to reach elite performance. Given the adoption of the LTAD model by so many organizations around the world, the misnomer surrounding the 10,000 hours rule has potentially major implications for existing long-term athletic development pathways (Lloyd et al., 2015). Lloyd et al. (2015) believe 10,000 hours should not be used as a guide for athletic development pathways as it goes directly against the concept of individualized program design which will be inherently different for each child or adolescent. The lack of research around LTAD reinforces its focus as a commercial product not supported by any significant line of evidence (Côté & Hancock, 2014). These concerns specifically exist around the distinct lack of substantive evidence to support the concept of “windows of opportunity” (in stage 3) in which the founders of the LTAD believe need to be exploited to enable a child to reach their athletic potential (Lloyd et al., 2015). The LTAD was originally developed as an elite performance model based on principles of motor

development and has been adjusted over the years to fit different agendas for the organizations and governing bodies adopting the program (Côté & Hancock, 2014).

Developmental model of sport participation. The Developmental Model of Sport Participation (DMSP) has been developed and refined over the past decade and a half presenting quantifiable and testable concepts about athlete development (Côté & Hancock, 2014). The various stages of the DMSP are consistent with both sport-specific and general theories of child and adolescent development (Côté & Vierimaa, 2014). Côté (1999) interviewed 15 individuals across four families covering three members of the Canadian national junior rowing team, and one tennis player competing at the Canadian national level to create an initial model. Within these interviews, 13 dimensions were assembled into three distinct chronological categories (Côté, 1999). The three stages of sport participation are labeled as sampling years (age 6-13), specializing years (age 13-15), and investment years (age 15+) (Côté, 1999). This original model was in line with results from other qualitative studies of athletes' development, while providing explicit and original propositions quantifiable and tested empirically (Côté & Hancock, 2014). Within this three-stage model, the concepts of sport diversification and deliberate play were the main elements of the proposed model (Côté & Hancock, 2014).

Following initial research findings and the development of the model, a second quantitative, retrospective methodology was developed over several years (Côté, Ericsson, & Law, 2005). Subsequent studies were conducted with groups of elite and non-elite athletes to refine the DMSP and provide clarity on its different outcomes and trajectories (Côté & Hancock, 2014). These ensuing studies found transitioning to the specialization stages were accompanied by higher amounts of deliberate practice, usually around the age of 13, leading to greater investment and deliberate practice in a single sport (Côté & Hancock, 2014). Following this

knowledge accrument, the DMSP was adapted to reflect the different developmental trajectories, and a new early specialization pathway was added to the DMSP to parallel the three-stage model of sampling, specializing, and investment, with an additional ‘recreational participation’ stage also added (Côté & Hancock, 2014). In the DMSP refinement, the retrospective method was adapted and used to compare the activities, experiences and outcomes of athletes engaged in different pathways of the DMSP (Côté & Hancock, 2014; Fraser-Thomas et al., 2008; Robertson-Wilson et al., 2003; Strachan et al, 2009; Wright & Côté, 2003). This holistic approach to athletes’ development was further substantiated with qualitative studies of athletes who had achieved long-term participation and exceptional performance in sport (Strachan, Côté, & Deakin, 2011). For the purpose of this study, coaching objectives and definitions will be included within the DMSP model.

Sampling. Following entry in sport, if the youth athlete avoids early specialization, they experience the first stage of sport involvement in the DMSP- Sampling. The sampling years occur between the ages of six and 13 (Côté, 1999). During the sampling years, parents are responsible for initially helping their children become interested in sport, and allowing them to sample a wide range of enjoyable activities without focusing on intense training (Côté, 1999). Athletes in the sampling years need to have fun and enjoy their sport experience, continuous involvement for the simple reason that it is inherently interesting and satisfying to do so (Côté et al., 2007b). Youth athletes need to be engaged in fundamental movements and test various roles within the context of sport, requiring an environment facilitating making friends and the refinement of personal and social competencies (Côté et al., 2007b).

Coaches should plan to avoid overly encouraging competition and performance during the sampling years (Côté et al., 2007b). The focus should be on intrinsically motivating

behaviors related to deliberate play opportunities rather than highly structured, time-constrained, externally controlled activities such as deliberate practice (Côté et al., 2007b). With respect to training, the development of fundamental movements (running, jumping, object manipulation) should be given priority when coaches design low-organization activities (Côté et al., 2007b). Coaches should ensure youth athletes are not engaged in one sport for more than four hours per week and it is important to discourage parents from entering their children exclusively in one sport on a year-round basis (Côté et al., 2007b). Coaches should also respect the need for children to sample a variety of sport and non-sport activities and refrain from scheduling practices/games so frequently it comprises other opportunities for children (Baker et al., 2003; Côté 1999; Côté et al., 2007b). Finally, coaches should make efforts to organize many social activities surrounding teams to enhance the social opportunities for children (Côté et al., 2007b), and provide opportunities for children to learn important life skills, such as cooperation, discipline, leadership, and self-control through their early sport participation (Fraser-Thomas et al., 2005).

Specializing years. The second stage, the specializing years, includes athletes aged 13 to 15 (Côté, 1999). Although this stage is shorter, it marks the period in which athletes gradually decrease their involvement in various extra-curricular activities and focus on one or two specific sporting activities (Côté, 1999). While fun and excitement remain central elements of the sporting experience, sport specific skill development is an important characteristic of the child's improvement during this stage (Côté, 1999). Athletes in the sampling years have elected to pursue a performance development trajectory, as their need to have fun and enjoy their experience is now complemented by their need to receive properly structured training in progressively greater doses and to acquire sport-specific skills necessary to reach more elite

competitive levels (Côté et al., 2007b). These athletes are no longer involved in sport for its inherent interest alone, but also feel the need to achieve extrinsic benefits affiliated with competition and performance (Côté et al., 2007b). It is important for coaches to arrange training, competitive, and organizational elements in accordance with the athletes' needs (Côté et al., 2007b). Coaches should do task analyses for each athlete to determine required skills, and plan drills to improve these skills, further challenging the athlete to improve (Côté et al., 2007b). During this stage of development, coaches must find opportunities for athletes to test their skills on a public stage (Côté et al., 2007b).

Investment years. At approximately age 15, the third and final stage begins (Côté, 1999; Fraser-Thomas et al., 2008; Strachan et al., 2009). In the investment years, the athlete is committed to achieving an elite level of performance in a single activity (Côté, 1999). The strategic, competitive, and skill development characteristics of sport emerge as the most important elements in these years (Côté, 1999; Strachan et al., 2009). These years are distinguished from the specializing years mainly by the extreme intensity of the athlete's commitment to the sport, and tremendous amount of practice (Côté, 1999). During these years, the child makes the commitment to achieve a high level of excellence in the sport, leading to play activities being replaced by larger amounts of intense practice (Côté, 1999; Côté et al., 2007a). The term investment years is derived from the investment of training time, money and other resources needed to be made (Côté, 1999).

DMSP and coaching. There are two distinct forms of sport coaching based on the competitive level of the athletes: Participation coaching and performance coaching (Lyle, 2002). These two forms of sport coaching both find solid ground within the DMSP. Participation coaching is distinctive because competition performance is not emphasized, and participants are

less intensively engaged with the sport (Côté et al., 2007b). Performance coaching entails a more intensive commitment to a preparation program for competition and a planned attempt to influence performance variables (Côté et al., 2007b). To this end, there is a high degree of specificity in the program a coach delivers to the athletes (Côté et al., 2007b). Lyle (2002) contended each form of coaching is very different, raising a number of issues with respect to matching individual coaches to contextual needs. Within participation coaching the relevant time frames would be the sampling and recreational years, while performance coaching includes the specializing and investment years (Côté et al., 2007b).

Other trajectories: Recreation and early specialization. Participants in recreational years, often labeled as after 13 years, may have elected not to pursue an elite development trajectory in sport, but remain involved because they see it as an outlet where they can continue fun and challenging competition (Côté et al., 2007b). These opportunities for horizontal movement across stages (going from investment to recreational, or even immediately into recreational following sampling) should be provided for participants so they may change their level of participation at any age if they so desire (Côté et al., 2007a). In many sports it is perceived to be difficult for a mid-teen to invest in a sport if he or she has not been specializing since the ages of 12-13, but in many sports it is possible. In this stage, coaches should address participation goals related to playful competition, fitness and social interactions (Côté et al., 2007b).

In sports where peak performance is achieved before puberty (e.g., women's gymnastics, figure skating), early specialization is often necessary to reach elite performance (Côté et al., 2007a). A variety of studies support early specialization as suitable (Abernathy & Russell, 1987; Ericsson et al., 1993; Law et al., 2007). These elite performers usually skip the sampling years,

and consequently do not always experience the enjoyment associated with sampling and play (Law et al., 2007). There are a myriad of negative consequences associated with this path.

Outcomes in youth sport. The postulates of the DMSP identify characteristics of sport programs promoting not only performance, but continued participation, and personal development for all involved in sport, known as the 3Ps (Côté et al., 2007; Côté & Vierimaa, 2014). There is evidence in research and practice where different youth sport programs are structured to meet these outcomes independently (Côté & Hancock, 2014). The challenging task of policymakers and administrators of youth sport programs is to develop a structure meeting the needs of multiple youth participants, and serving different outcomes of youth sport (Côté & Hancock, 2014). Challenges aside, the 3Ps are found to be the general outcomes of youth sport are presented below to further develop the picture of the DMSP.

Performance. Early specialization programs where children are identified and selected at a young age to compete and achieve at an elite level of performance are common in several countries around the world and in various sports (Côté & Hancock, 2014). The human and physical resources invested in these programs are important as youth are seen as raw potential to be developed (Côté & Hancock, 2014). The problem with identifying talent is research of talent detection in sport show long-term prediction of talented athletes is unreliable, especially when detection of talent is attempted during the pre-puberty years and growth periods (Vaeyens, Güllich, Warr & Philippaerts, 2009). The framework of deliberate practice (Ericsson et al, 1993), and 10,000 hours [popularized in *Outliers* (Gladwell, 2008)], has been discussed with pros and cons identified, but this framework proposes elite athletes must specialize in their main sport and start deliberate practice at a very young age. Côté and Hancock (2014) instead suggest

providing opportunities for children to participate in various informal and organized recreational sports even if developing elite athletes is the ultimate goal of the program.

Participation. Building upon the concept of providing opportunities to participate in informal recreational sports, sport participation is a primary goal in the DMSP. While youth sport clearly provides opportunities for long-term participation, there appears to be a void between the potential of youth sport and some of the negative realities of youth sport programs, as evidence by dropout rates (Côté & Hancock, 2014). Youth sport programs around the world are adopting a view of sport focusing on long-term athlete development, institutionalization, elitism, early selection and early specialization (Strachan et al., 2011) instead of focusing on the short-term and inherent enjoyment resulting from sport participation (Côté & Hancock, 2014). The current sport programs, promoted as recreational, often discourage children from participation in a diversity of rewarding and enjoyable activities, stifling overall sport participation (Côté & Hancock, 2014).

Personal development. Sport researchers and the wider sports community need to have a clear vision of the inherent value of sport participation and the best way to transmit positive personal values through sport (Côté & Hancock, 2014). One outcome of participation in a variety of sports is an increased set of life skills. These skills consist of intrapersonal skills (time management) and interpersonal skills (communication, leadership), both being developed through sport programs (Wilkes et al., 2009). Past studies suggest youth who participate in a number of different activities report higher levels of positive peer relationships than youth who participate in fewer activities (Fredricks & Eccles, 2006). Participation in a variety of sports also encourages identity exploration by exposing children to different environments which provide opportunities to decide the level at which they wish to participate (Wilkes et al., 2009). In

addition to the identity exploration and developing positive peer relationships, extracurricular activities have also been linked to lower levels of risky behavior during the high school years than their non-involved peers (Eccles & Baber, 2003).

The Future of the DMSP. The journey from the beginning of the DMSP in Côté (1999) has displayed a fluid system of analyzing sport participation in youth athletics. This model is under rigorous review, with researchers studying seven postulates of the DMSP. These postulates are (Côté et al. 2009):

- Postulate 1: Early diversification (sampling) does not hinder elite sport participation in sports where peak performance is reached after maturation.
- Postulate 2: Early diversification (sampling) is linked to a longer sport career and has positive implications for long-term sport involvement.
- Postulate 3: Early diversification (sampling) allows participation in a range of contexts that most favorably affects positive youth development.
- Postulate 4: High amounts of deliberate play during the sampling years build a solid foundation of intrinsic motivation through involvement in activities that are enjoyable and promote intrinsic regulation.
- Postulate 5: A high amount of deliberate play during the sampling years establishes a range of motor and cognitive experiences that children can ultimately bring to their principal sport of interest.
- Postulate 6: Around the end of primary school (about age 13), children should have the opportunity to either choose to specialize in their favorite sport or to continue in sport at a recreational level.

- Postulate 7: Late adolescents (around age 16) have developed the physical, cognitive, social, emotional, and motor skills needed to invest their effort into highly specialized training in one sport.

These seven postulates are under review from multiple researchers involved in DMSP research. Based upon early finding, postulates one, two, four, five, and six have been strongly recommended (Côté & Vierimma, 2014). Postulates three and seven have both been found to have weak support, and are not strongly recommended (Côté & Vierimma, 2014).

Purpose

The purpose of this study is to examine age group swim coach's perceptions of sport specialization. This study aims to attain perspectives from coaches in the sport of swimming instead of the athletes. Coaches have been found to be substantial influences on the experiences of the young people with whom they interact (Greendorfer, 2002) and can offer support and guidance to athletes ultimately allowing for the formation of strong bonds (Jowett & Poczwardowski, 2007). This study contributes to the research on early sport specialization by providing coaching perspectives from a group of coaches who are directly involved with athletes at the age where the decision to specialize versus sample is made (10-14), and bears significance because it is critical to understand what coaches perceive is important to the development of youth athletes. With past research looking at coach's roles in the development of the athlete and the development of the athlete itself, this research will provide a different point of view to interpret the athlete's choice of sport specialization versus sport sampling.

Chapter 3: Methods

Participants

This study gathered perspectives from coaches directly involved with youth swimmers at the age (10-14), where a decision to specialize is commonly made, with the age of 12 as the target age for the participants primary group coached. The age of 12 was the target age for multiple reasons. First, in his study of youth athletes, Malina (2010) found swimming to be the sport with the earliest median age of specialization, which was the age of 10. Barynina and Vaisekhovskii (1992) found swimmers who specialized before 11-years of age spent less time on a national team, and retired earlier than late specializers. Also, the age of 12 is also the year in swimming where teams begin to delineate between their age group program and their senior program, and often times the goals and commitment on the groups begin to shift.

Purposive sampling was used to recruit active swim coaches working for USA Swimming sponsored clubs who are USA Swimming Certified coaches. These coaches were purposefully recruited based on the inclusion criteria of certification, club performance, job title and geographic location (Patton, 2005). As the National Governing Body of the sport of swimming, USA Swimming provides a strong base of coaches to choose. Across the entirety of USA Swimming, there are thousands of club programs. In order to narrow the choice of club programs, only coaches working for club programs recognized as high achieving organizations were targeted. According to USA Swimming Club Excellence Program (2010):

The USA Swimming Club Excellence Program is a voluntary program identifying and recognizing USA Swimming clubs for their commitment to performance excellence.

This program strives to promote the development of strong, well-rounded age group and senior swimming programs producing elite 18 and under athletes, and provide

recognition and resources to motivate and assist member clubs to strive for the highest ideals of athlete performance. This program awards Gold, Silver and Bronze Medals to the top-200 clubs in the country.

This provided a large population of teams to choose. In addition to working for high achieving clubs, all participants work as full-time coaches.

The coaches contact information, specifically emails, was gathered through team websites. Once coach emails were gathered, an introductory email was sent to all potential subjects describing the nature of the study, and asked for willing and able participants. Initially 16 coaches were contacted, and of those 16 coaches, 11 responded. Within this group of 11, eight followed through and participated in the study, two were sent additional follow-ups but did not respond, and one respectively declined due to limited time to set up an interview (Corbin & Strauss, 2008; Owen, Bond, & Tod, 2014). In order to increase the number of interviews, a second group of coaches who fit within the requirements of the study was contacted, 11 in total, and of those 11, three responded and participated in the study. Eleven coaches participated in interviews in total.

The coach's age, gender, and experience level was not taken into account in order to provide natural variety within the sample. Of the 11 coaches, eight were male and three were female, and all 11 were Caucasian. Out of 11 coaches, eight identified as head age group coaches, one as the associate head coach, one as the developmental program director and the final as the head coach of the program. The associate head coach had recently been promoted from age group head coach, while the developmental program director fulfilled the same duties as head age group coach for other programs included. The lone participant who identified as head coach was also a lead coach for their age group program. Interestingly, coaching experience

fell on one of two ends of the career spectrum for all but one coach, with five coaching for thirty or more years, five for eight years or less, and the final for 17 and a half years. In total, the longest tenured coach was 42 years, while the shortest were two coaches midway through their fourth season.

In terms of certifications, all eleven coaches were USA Swimming Certified. In addition to the required USA Swimming Certification, the American Swimming Coaches Association (ASCA) offers certification to coaches seeking the opportunity to further advance their swimming knowledge (American Swimming Coaches Association-Certification, 2017). Since 1988, more than 15,500 coaches have been certified with ASCA with the goal of delivering the message to peers, employers, athletes, and parents that ASCA coaches are professionals (American Swimming Coaches Association-Certification, 2017). This additional certification provided an interesting perspective from the participants, as two coaches were recognized as ASCA Level 5 (the highest level), two were level two, one was level one, two are ASCA members but are not certified and four were not ASCA certified. All coaches spoke about ASCA and their certifications unprovoked, while many needed specific reminders about USA Swimming certifications.

The coach's primary groups that they coached ranged from age 8-14. Five coaches primarily coached swimmers aged 11-14, with one group of swimmers age 11-13, while another works with 13-14 only. The final coaches work with a variety of age groups, with one working with two groups (9-10 and 11-12), another working with 9-10 and 13-14, a third who coaches specifically the 11-12 group and the final coach working with athletes age 8-11 fresh out of their teams developmental program. This sample provides interesting insight and topic of conversation

about how teams break up their age group swimming programs, a topic to be discussed in later sections. The table of participants can be found on page 45.

Data Collection

Approval for the research project was granted by the affiliated university and the Institutional Review Board (IRB). Following IRB approval, two practice interviews were conducted prior to the start of official interviews. The interviews were conducted by a male researcher with previous swimming experience at national level competition, which was useful in developing rapport with the participants. The two practice interviews were conducted with coaches working with the same demographic as the study participants. These practice interviews provided valuable feedback on the structure and flow of the interview, an opportunity to properly gauge time parameters, and practice for the lead investigator. All interviews were conducted on campus at the University of Tennessee within the Allan Jones Aquatic Center in a private office located off deck by the lead investigator of the study. The location was used for one in person, and 10 phone interviews. Interviews were conducted after coaches read information on the nature of the study and completed consent forms. Interviews were structured with the same questions and question sequence. All interviews took place over a three week period, and lasted between 15-35 minutes. In total, approximately five hours of interviews were recorded, resulting in 33 of transcripts.

The qualitative interview aimed to gain in-depth understanding of participant's perspectives on youth sport specialization in swimming, so as to paint a full picture of their thoughts and understanding on the topic. The interview guide was created based upon previous questions used by sport specialization researchers (Côté, 1999; Wolfenden & Holt, 2005). The interviews include three sections of open-ended questions, allowing participants to discuss any topic related

Table 1: Participant Demographics

	Position	Years of experience	Certification level	Primary group	Age recommendation
1	Head age group coach / Director of competitive swimming	42	ASCA Level 5	9-10's & 11-12's	13-14
2	Head age group coach	4	N/A	11-14's National Track	15-16
3	Head age group coach	3 ½	ASCA Level 2	10-14 National Track	Females- 11-12 Males- 13-14
4	Head age group coach	8	ASCA	11-14 National Track	13-14
5	Associate head coach	17 ½	N/A	9-10, 13-14 Elites	13-14
6	Head age group coach	30	ASCA Level 1	11-14	Female- 14-16 Male- 16-18
7	Head age group coach	31	ASCA	11-12 State Qualifiers	14-15
8	Head coach	34	ASCA Level 5	8-11 Developmental	Female- 11-12 Male- 13-14
9	Head age group coach	8	N/A	10-14 Age Group Elites	14-15
10	Head age group coach	30	N/A	11-13	13-14
11	Developmental Director	5	ASCA Level 2	13-14	12-13

to their coaching situation and the question at hand. The first section was an introductory period which allowed for a rapport building phase and also the opportunity to gather baseline information about the participant. The second section centered on coaching philosophy, aiming to provide the participant the opportunity to explain their coaching view, framing their perspectives on sport specialization. The final section was specific to sport specialization, with direct questions about the topic.

1. *Introduction:* What is your current position? Before being hired for your current job, what other positions have you held and what were some of your responsibilities? How many years' experience do you have coaching? What coaching certifications do you hold? What is the level of your certification? What is your primary group you coach?
2. *Coaching Philosophy:* What is your primary goal for a season? How would you describe your role as the coach of your swimmers? Do you put any pressure on your swimmers?
3. *Specialization specific:* What do you believe sport specialization entails? That you're aware of, have your swimmers made sacrifices to continue participation in swimming? If yes, what are those sacrifices? What roles do other sports play in the development of your swimmers? Do you believe your swimmers should participate in only swimming? At what age should swimmers exclusively train for swimming? What are the positive effects of swimmers focusing solely on swimming?

Data Analysis

All interviews were digitally recorded and transcribed. The interviews were transcribed verbatim and formatted for analysis by the researcher then sent to the participants for member checking (Mirriam, 2009). Member checking is one step in the data validation process (Gratton & Jones, 2004), and allows participants to review their interview transcripts to ensure their

responses were accurately transcribed (Andrew, Pederson, & McEyoy, 2011). Participants were given the opportunity to add, delete or rework any data they felt does not accurately reflect their intended communications. Exact wording was used as often as possible in order to retain and reflect the meaning (Berg, 1998). Data was divided in groups using the three question groups: Introduction, coaching philosophy and specialization specific. The researcher coded the transcripts individually (Saldana, 2015). The overall goal of constant comparative data analysis is to find patterns (Merriam, 2009). Through the attentive reading and rereading of the coded data, emergent themes were identified (Rice & Ezzy, 1999). One researcher was involved in the interviewing, transcription and analysis process.

Positionality

It is important to note my current role as an age group swimming coach. The positionality that researchers bring, and the personal experiences through which positionality is shaped, may influence what researchers may bring to research encounters, their choice of processes, and their interpretation of outcomes (Foote & Bartell, 2011). Currently I work on deck with athletes aged 13-18 as a part time job. This perspective has provided me real world experience working with athletes who have either chosen to specialize, or are in the process of choosing. Also, my perspectives have been shaped by fellow coaches, both at my current position and in past positions, including one position where I served as a head age group swim coach in charge of athletes age 14 and under. Despite my background, personal biases were set aside as best as possible in order to provide perspectives only from the participants in the study.

Chapter 4: Findings

Analysis revealed three primary themes reflecting coaching perspectives connected to the relationship between sport specialization, sport sampling and development. These were 1) support of sport sampling, 2) sacrifices connected to sport participation, and 3) coaches need for control. The themes and subthemes can be found in the table at the top of the next page.

Theme 1: Support of Sport Sampling

All eleven coaches acknowledged the role of other sports and generally supported the notion of sport sampling. Sport sampling is the participation in a variety of sports and activities through which an athlete develops multilateral physical, social, and psychological skill (Wiersma, 2000). Participant 1 stated “when these kids have a great background in other sports it only helps”, while Participant 6 said “multiple sport approach will allow the athlete to develop general athletic skills, and that’s something we know becomes valuable in the pool when someone comes with that athletic background, the transition to swimming is much easier.” Participant 10 also encouraged sport sampling saying “I try to encourage them to do more than one thing, but you want to make it fun, and not so serious that they don’t want to do it.” This support of sport sampling emerged through three secondary themes found within this primary theme. The three secondary themes were 1) the role of other sports and sport selection, 2) movement development and diminishing physical education, and 3) balancing encouragement with attendance requirements.

Role of other sports and sport selection. As stated earlier, all 11 participants acknowledge the role of other sports in the development of their athletes. Early sport sampling postulates the first years of sport participation should be characterized by the involvement in different sports (Moesch et al., 2011). This support of early sport sampling was found within all

Table 2: Primary and Second Themes

Primary Theme	Secondary Themes
Support of sport sampling	Role of other sports and sport selection Movement development & diminishing physical education Balancing encouragement and attendance requirements
Sacrifices connected to sport participation	Social sacrifices Sport sacrifices
Coaches need for control	Skepticism of sport sampling Age recommendations Contradicting statements

11 interviews. Participant 2 said “we can see that those swimmers who have played other sports, we can see a little of an ability to use their bodies.” Participant 5 stated:

I think they (other sports) are significantly beneficial. I think different cross training exercises help build the muscles we're not using ... I think doing other sports is healthier for the swimmer. I think it helps prevent injury down the road...with our kids who go play soccer, or even do dance or other activities tend to be more athletic and tend to be more successful swimmers later in life, later down the road.

These ideas also expanded to the role of sport sampling and a path to greater performance in whichever sport the athlete selects. This is supported by studies demonstrating some athletes with sport sampling backgrounds who still reached an elite level in sport (Baker et al., 2003; Baker et al., 2005; Soberlak & Côté, 2003). Participants 1, 3, 4, 7, 8, and 9 all spoke of how sport selection is important in development. Participant 8 said, “I want them to make the right choice (determining whether to specialize in swimming or not). I would hate to keep the next professional basketball or baseball or anything out of their sport.” Participant 8 expanded on this, saying:

Years ago I had an age group breaststroker and she chose to play volleyball and she was a great All-American, I think they won a couple of national titles at (university). Yes I would have loved her to stay because she could have been world class. She would have been good at whatever, but she had great success at the other sport ... We have (another) girl who's a good little swimmer, but she's a great gymnast, and the gym coach really gave her a lot of grief for coming with wet hair and coming late, and she finally, I think at 12, told me that she was quitting gym. Well she stayed 5'1 and little. She swam well but not at the level she had the potential to be at in the other sport.

This point was echoed by Participant 11 who said:

I think at a certain level (you should specialize), I think when kids are younger they should participate in a lot of different sports, and to do a wide variety of things, because they don't know what sport they might like the best, and they're not going to know that until they try it.

Four coaches specifically pointed to gymnastics, participants 3, 4, 8 and 9. Participant 4 stated "I think other sports are great, especially in our ten and under age, I actually wish everyone did gymnastics." Gymnastics wasn't the only sport specifically pointed out by coaches. Participant 1 stated:

I think of (a former swimmer who is currently swimming at the division one level) who was a heck of a baseball player when he was younger ... being that level of an athlete really helped him ... look at him now, playing ball sure hasn't hurt him at all, probably helped him really.

Participant 7 told a story of a swimmer who also wrestled and some of the benefits that athlete experienced:

Back in October, I had one of my top eleven year old boys who came up to me and said I want to wrestle in middle school ... I told him that's fine, no problem, and he asked if he has to quit swimming, and I said I hope not ... we worked out a plan where when he was at wrestling he'd show up late, or maybe not come as much ... it made a huge difference because wrestling is physically demanding so I knew he'd get a great workout and a lot of strength work and when he came back, maybe a month in, and he just destroyed people in a meet, and he had barely been in the water, so I saw that benefit.

These examples provide evidence of coaches supporting the idea of sport sampling, and specifically point to examples where their athletes have succeeded in not only the sport of swimming, but other sports as well. This may be connected to movement developmental derived from sport sampling.

Movement development and diminishing physical education. The importance of sport sampling and movement development was support by Participants 1, 2, 5, 6, 7, 8, and 10. These statements are supported by studies where the growths of well-rounded athletic abilities were found in athletes who sampled many sports (Baker, 2003; Carlson, 1988; Gullich & Emrich, 2006; Hume et al., 1994; Lidor & Lavyan, 2002; Moesch et al., 2011). Participant 2 recognized how past athletic experience has developed movement saying “you can see which athletes know how to load their hips in a healthy squat position and those who can move and who cannot”. Participant 7 also recognized how other sports teach exercises their program either does not have time to teach, or does not prioritize teaching, saying:

I think it can help develop the athlete as a whole getting them stronger, and it might even do some things we'd like to do but don't have the time ... I think cause I deal with

younger swimmers, I think it completes the athletes ... the best athletes tend to be our best swimmers ... I think it plays a big role developing the swimmer.

Two participants (Participants 4 and 10) pointed to the loss of physical education in school as contributing to their programs support of sport sampling. It is interesting to note, as part of this secondary theme, how sport sampling can be a route to fulfill some of the lost movement education once provided by physical education in school. Participant 4 recognized how multiple sports can ease this loss of movement development, stating:

The skills, the athleticism and the physical literacy that they can develop in other sports on land, is at a premium, but I feel like, a lot of times, especially because the kids don't have PE (physical education), we have to teach a lot of this physical literacy, not just in the water, but on land, because they're not getting it elsewhere and it also helps to have athletes who at younger ages are exposed to other sports because they are getting that physical literacy through learning movement, learning coordination, they're learning how their body works and all that stuff, so I feel like, at those younger ages, it's actually really important.

Balancing encouragement and attendance requirements. This secondary theme addresses how coaches may recognize the importance of other sports and their desire to encourage sport sampling, but need to balance these insights with their program and groups attendance requirements. This is an important secondary theme as it speaks to the dynamics of the organizations these coaches work within, and how the systems in place may dictate their athletes' abilities to sample in a variety of sport. Participants 2, 5, 6, 7, 9, and 10 spoke of the importance of practice attendance, and balancing multiple sports and activities. Participant 2 stated "I think that there is room in an athletes life for success in school, in swimming and

something else, particularly at a younger age ... as they get older, it gets harder depending on what the extracurricular activity is.” Participant 2 recognized how the group they coach is where this transition to becoming an older and more specialized athlete occurs, explaining:

The swimmers in my group ... we swim up to seven times a week for two hours plus dry land, so after that there is not a ton of time, and part of that is a commitment to be their five times a week for two hours ... so within my group we don't have a ton of athletes who do other sports.

At a younger age, Participant 7 explained:

While sometimes it's difficult, I'll admit, that I want the kids there a certain number of times a week, especially the 11-12 group ... I definitely encourage it as long as we communicate and I know when they're going to be there and when they're not going to be there.

Participant 6 further explained how their program does encourage multisport athletes, but their programming addresses it by saying:

No (I do not believe swimmers should participate in only swimming) ... we provide that opportunity in our business model and plan, but it is not something we tell someone, 'no you cannot do this and you cannot do that'

Participant 9 talks about actively discouraging the athletes to play multiple sports once they begin to develop, because of their athleticism or size, and its importance as it relates to swimming saying:

I have encouraged them to back off other sports, and I've got a 13 year old girl that's almost 5'8", 5'9", and I'm ok with her exploring basketball or volleyball, and I have another swimmer ... she's not in the upper percentage of what I see being a top swimmer,

but she does triathlons, so I encourage her to keep swimming because she is so good at triathlons and she wins everything, so there is a purpose there as well, so I would say that each kid is different, some should be full time and some should be looking at other sports.

Theme 2: Sacrifices Connected to Sport Participation

This primary theme was drawn from questions related to sport specialization. Questions about sacrifices were included because of the intense time commitment related to sport participation. Youth sport organizations rely on a membership scheme with a base populated by beginners (as young as five), with the program eventually expanding practice periods, intensity and extended seasons (Stewart & Shroyer, 2010). All 11 participants recognized some sacrifice associated to participation in swimming. Participant 4 explains how trying to do too much can wear an athlete down, saying:

I think it comes down to time and physical strength. I have seen my middle schoolers ... doing too much is too much, they have so much school work, and obviously swimming is so physically straining, and then if they are doing other stuff on top of that stuff they tend to break down and injury is more of a possibility, so if they get into the age where, from a scheduling stand point, no matter what sport they are choosing, I think they've got to decide because I've seen to many kids trying to juggle to many things and just get worn down ... anytime you're involved in a sport when you're trying to excel at an elite level, which I think many of our athletes are, I think there's a sacrifice, whether it be not playing another sport, or a social sacrifice.

Responses were categorized into two secondary themes found within sacrifices connected to sport participation. These two themes are sport sacrifices and social sacrifices.

Social sacrifices. In 10 of 11 interviews social sacrifices connected with sport participation were related to time missed with family and friends. These sacrifices are recognized as social sacrifices as they pertain to relationship building. Participant 11 said “they’re giving up social time with friends, afternoons and evening time with family, so they definitely make sacrifices to commit to the sport” while Participant 3 said “we’ve had other parents and families who didn’t want to miss the beach so they had to wait to go to the beach until after practice on Saturday.” Participant 7 pointed to time on the weekends lost, stating:

I think they have (sacrificed), I think it’s more a social ... definitely will sacrifice, with meets or an early morning Saturday, they may not go to a social event on a Friday night, or may have to skip a special weekend with friends because they are at a meet somewhere else ... I know some of them have sacrificed some vacation time, because sometime our state championships fall on spring break.

Participant 8 also talked about the weekends, downplaying the time lost by saying:

I think they (sacrifice) all the time. On weekends they sacrifice what I call hang out time. They are under the perception all their friends are out having a great time but really they are doing nothing and they really are not missing anything ... if it’s with the younger kids it might be they have to leave a sleep over early or go to it late, or be tired, they give up some weekends, a birthday party here or there, whatever it may be.

Participant 10 discussed how sacrifices impacted their relationships with their peers and how they alleviate this stress when they stated:

They are making sacrifices in different things, not going to spend the night at someone’s house, or to a party ... I try to alleviate that stress ... give them an out and say its ok to do fun things with other friends ... a lot of times, peer pressure will get (to) these kids and

they will have problems with their friends from school who ask why are you doing this again and why are you doing this every day, and it's hard for them to explain why they love it, and why they have to be there, so if you give them an out every once in a while its good for them.

Sport sacrifices. Six participants (1, 2, 3, 5, 6, 11) identified sacrifices related to other sports as connected to participation in swimming. Participant 1 believes it is a two-way road, saying, "I think it does go both ways. Someone may have to stop playing baseball but someone else stops swimming. It really comes down to the kids just choosing what they want to do." Participant 2 talked about one of their three sport athletes, who "decided this fall, after volleyball, that this would be her last volleyball season, and she would swim and do high school and that would be it" and went further, explaining "We swim up to seven times a week for two hours plus dry land ... after that there is not a ton of time, and part of that is a commitment to be their five times a week for two hours." Participant 11 explained how they address this issue with their athletes by stating:

I've had a handful of swimmers that had to choose between another sport they were playing and swimming ... it's something I had to sit them down and talk with them one on one and tell them they have a ton of potential and really be at a high level in swimming, but they need to focus their time and energy on swimming.

Other coaches who identified this sacrifice included Participant 5 who said "we have had swimmers stop doing other sports so they can make 90-100% of practice attendance" and Participant 6 who reminded us "we don't have a business model that financially allows a family to come part of the week."

Theme 3: Coaches Need for Control

Eight of 11 coaches alluded to a need for control, at some level. Most of these conversations are framed within the team requirements for practice attendance, and the time demand of the sport of swimming. The need for control may be derived from the shift in youth sport in general. During the past two decades, the shift from youth-drive recreational sports to coach-driven skill development with an emphasis on a single sport has gained significant momentum (Feeley et al., 2016). This shift, in conjunction with the popularization of the 10,000 hours rule may lead coaches to seek more control over their athletes. The 10,000 hours rule may impact coaches need for control by setting a standard for a coach to reach in terms of practice time. This desire to reach the threshold of 10,000 hours may push coaches to ask more of their young athletes in order to reach this level at a younger age, and at an age where the athlete is still a member of their program. Participant 2 explained the time requirements of their group, saying “we swim up to seven times a week for two hours plus dry land, so after that there is not a ton of time, and part of that is a commitment to be their five times a week for two hours ... you try to have to train at that 16-20 hour a week range.” Participant 8, who coaches 8-11 year olds, spoke of the priorities within the life of a swimmer, saying, “We all agree family and/or religion are the most important things, and then school and then swimming should be the next priority.” Participant 2 explained the need for control outside of the training parameters as well, explaining:

When a swimmer specializes in swimming they are not exhausted when they get to the pool, physically ... when they are in dry land facilities we know that there is nothing else that might cause an injury or fatigue, it’s a controlled environment and we have the athletes full scope of activity, and we are in more control of the athlete ... it also gives us

control outside the facility, we can say you need to go to bed at this time to get enough sleep, it's just swimming and school work and then you need to go to bed ... unfortunately some stay up late snapchatting and social media ... no its I'll come to practice, go home, eat dinner, do my homework, and then maybe watch TV and then go to bed ... or I'll stretch and go to bed and sleep ... so it's that ability as a coach to know that it's not the same amount of variables anymore so we are in more control.

The theme of control includes three sub themes: Skepticism of sport sampling, age recommendations and contradicting statements.

Skepticism. Six coaches recognized the role of other sports but were skeptical of their impact on swimming performance. This skepticism is potentially related to the coaches desire to control their athletes, despite recognizing the role of other sports. Participant 2 said:

I don't know if I have seen a correlation between ... this swimmer was a multiport athlete for longer (and) this result occurred ... or this athlete has been focusing specifically on swimming since they were 10 and have seen this result in the water in either direction ... we have multisport athletes who are some of the best swimmers in our groups, and then we have multisport athletes who are not, and the same applies for solely swimmers ... so I don't know if there is a direct correlation that I've seen personally.

Participant 1 sees the negatives of other sports saying "we do not mind at all when other sports are in a kids life, or any activity, but then a lot of times the kid probably, maybe, won't swim quiet as well as he or she would otherwise." Despite Participant 8 recognizing the importance of multiple sports, there is also issues related to practice attendance, saying:

I feel as they get older, what happens, is they might (have) to choose something and only miss 10 percent or 20 percent of the work outs because of that sport, and are still coming

a fair amount, but then the next year that grows to maybe 20 or 40 percent, then they do it another year and it slowly grows as they go.

The connection between coaches need for control and skepticism related to sport sampling may also be related to the age recommendations provided by coaches.

Age recommendations. Age recommendations and specialization was a direct question within the interview. The purpose of including this question was to draw connections between the participant age recommendations and the LTAD and DMSP provided in the theoretical framework. These responses also resulted in interesting conversations related to the age recommendations and the groups the participant coach. Participant 3, 4, 5, and 11 chose an age within the groups they coach, while participants 1, 2, 6, 8, 9, and 10 chose an age immediately following their group. Only participant seven chose an age beyond their group and the immediate group following their own. This is interesting to note, as a coaches' desire to control their athlete may be related to the age they believe their athlete should be specializing in the sport.

Another point of interest was the three participants (3, 6, 8) who responded with gender specific ages. Participant 3 and Participant 8 stated “females 11 to 12 ... 13 to 14 boys”, while Participant 6 pointed to differences in maturation, saying “physical maturation for the boys is not until junior or senior year, and for the girls it is not until freshman or sophomore years.” Of the other eight coaches, Participant 11 chose the youngest age for specialization, saying, “I think at 12, or maybe 13, when it's on that natural progression where you have to swim six days a week, then I think specialization is good.” Participant 11 went on to explain further how the age of 12-13 is for those hoping to perform at the highest level once they are 13-14 by saying:

With the 13-14 level my expectation is that they are going to keep swimming and are going to specialize in the sport, and kind of having that much high level of expectation ...

those kids should love swimming, and they should be ready to give it their full commitment.

Participant 4 recognized the exceptions to sample other sports beyond the age of 13-14, saying:

Ideally 7th or 8th grade they'd stop doing other sports. I think you get to high school where other sports are offered they'd never tried before, and you have those kids in the category that if you don't let them do it, they might just leave our sport anyway

Participant 5 referenced their practice schedule allowing younger swimmers to sample other sports, saying “our ten and under schedule is set so they can do other activities ... probably looking around that 7th or 8th grade mark (they should specialize).” As straight forward the category of age recommendations, what follows delves into contradictory statements made throughout interviews.

Contradicting statements. This section will supply examples of contradiction within interviews. The most startling contradictions came from the interview with Participant 6 who, when asked whether an athlete should only participate in one sport stated, “No ... we provide that opportunity in our business model and plan, but it is not something we tell someone you cannot do this and you cannot do that.” As stated, the business model of the program offers a track to specialize, but Participant 6 also recognized the differences in maturation, saying “physical maturation for the boys is not until junior or senior year, and for the girls it is not until freshman or sophomore years.” When asked about sacrifices made by their athletes, the coach responded saying “we don't have a business model that financially allows a family to come part of the week.”

Participant 2 also provided interesting contradictions. Participant 2 expressed the importance of other activities, stating, “I think that there is room in an athlete's life for success in

school, in swimming and something else, particularly at a younger age.” Participant 2 then went back to say:

The swimmers in my group ... we swim up to seven times a week for two hours plus dry land, so after that there is not a ton of time, and part of that is a commitment to be their five times a week for two hours ... so within my group we don't have a ton of athletes who do other sports.

But followed the statement with the following:

You don't want someone who lives, and breathes and eats and sleeps and dies with swimming, and that's all they do ... because then they can get a little crazed about it, a little fanatical ... I want them to have something else in their life that they find enjoyment.

The coach appears to be alluding to a non-sport activity, but it is interesting given the time commitment asked of the athletes. The coach further muddies the waters later explaining the importance of sport specialization saying, “It's ‘I'll come to practice, go home, eat dinner, do my homework, and then maybe watch TV and then go to bed ... or I'll stretch and go to bed and sleep.’” The coach seeks to have control of the athlete's physical activity and free time.

Chapter 5: Discussion

This study makes contribution to the literature by providing coaching perspectives on sport specialization and sport diversification. Generally, the study participants agree with the stages of sport participation as described in Côté's (1999) initial study. For example, Participant 1 said, "that 13-14 range is a good time to start thinking of paying more attention to one sport over another, but there is always someone who can break the rules, play multiple sports, or do other activities." The stages of sport participation are labeled as sampling (6-13), specializing (13-15), and investment (15+) (Côté, 1999). The sample included coaches working with youth athlete's transition from sampling years (age 6-13) to specializing years (age 13-15). When questioned, coaches recommended the ages of 11-14 for specialization, with nine pointing to the range of 13-14, and beyond. These responses match the research recommendations made by Côté, (1999), fitting firmly within the specializing years of age 13-15. Participants 1, 4, 5, and 10 all chose the age range of 13-14, with Participant 5, who works with 9-10 and 13-14 elites, recognizing the range by saying "I'm at the end of where they're starting to choose, 13-14." Only two coaches (Participants 3 and 8) identified ages 12 and under for specialization, but each suggested this was an age for females only, with Participant 8 stating "females 11 to 12 ... 13 to 14 boys." The age of twelve fits within the sampling years, the age Côté (1999) recognized as athlete's aged 13 and under.

Related to the LTAD, the sample included coaches working with athletes within Stage two (the learning to train stage) and Stage three (the training to train stage). The athletes within stage 2 are males aged nine to 12 and females aged eight to 11. The coaches working with athletes within stage two (Participant 1, 3, 5, 7, 8, 9) all spoke of season goals matching the recommendations made by the LTAD. Participant 8 said "the number one goal is to learn that

hard work is fun, and getting them hooked on the sport ... enjoying that process of getting better.” The chief objective of stage two is to learn all fundamental sport skills and build overall sport skills (Balayi, 2001; Balayi & Hamilton, 2004). In addition to matching the recommendations to their goals, all participants recommended ages beyond the recommended ages (males 9-12, females 8-11) by the LTAD. The coaches working with athletes in the third stage also recognized goals matching the LTAD recommendations. Participant 5 stated as his primary goal, “to make technique better while building an aerobic base.” The primary objective is to build the aerobic base, build strength, and further develop sport-specific skills, while during competition athletes’ play to win and do their best, but the major focus is learning the basics (Balayi & Hamilton, 2004), matching the response from Participant 5.

The age ranges mentioned above match the sampling and specializing stages suggested in Côté (1999), as well as the learning to train and training to train stages in Balayi (2001) and Balayi and Hamilton (2004). During the sampling years (in the DMSP) parents are responsible for initially helping their children become interested in sport and allowing them to sample a wide range of enjoyable activities without focusing on intense training (Côté, 1999). In the interviews, coaches pointed to preseason parent meetings where the conversations on sport specialization seemed to center around the idea of participating in other activities and sports.

Participant 4 explained this pre-season parent meeting, saying:

I do an 11-14 parents talk ... and one of the things we talk about with the parents is ... for creating good home life, make sure your kid is progressing in other things in life, not just swimming, whether it be their school work, or their school friends, or even their friends in swimming ... and developing a life that doesn't revolve around sport is really important.

This study was not aimed at dissecting the roles of parents and athletes decisions to specialize or not, but it is interesting to note many coaches encouraged that conversation. Parents' initially include introducing their children to sports but during adolescence parents become less involved, progressing from a leadership role to a supporting role (Fraser-Thomas et al., 2008). At some point during a young athlete's career, the person with the greatest influence shifts from parents to coaches (Fraser-Thomas et al., 2008). Two participants mentioned parents and their roles during interviews, but additional studies on the role of parents in swimming around the ages of specialization have been done outside of this study.

In addition to supporting the notion of sport diversification, questions related to season goals led many coaches to cite fun and enjoyment as primary goals. Participant 1 said, "The number one goal is to have fun." The importance of setting fun and enjoyment related goals are pivotal. Athletes in the sampling years need to have fun and enjoy their sport experience, being involved for the simple reason that it is inherently interesting and satisfying to do so (Côté et al., 2007b). Seven coaches specifically stated fun and enjoyment were primary goals of the season. These coaches, and their goals, may help combat burnout and dropout in the sport. A typical reason for dropping out among talented athletes is training programs focused on early specialization (Baker, 2003: Baker, Côté, & Abernathy, 2007). A study of the relationship between goals set by coaches related to fun and enjoyment and how this matches their athlete's level of fun and enjoyment would open a discussion to the success of these coach set goals. This study did not delve into this conversation.

Additionally, within the sampling years, Côté et al. (2007b) recognized, with respect to training, the development of fundamental movements should be given priority. Coaches who maintained their athletes should continue to develop in other sports supported this. This is

support also by Baker (2003) who believed a diversified sport approach develops transferable athletic skills through the effects of cross training in multiple sports and/or activities. This positive side effect of sampling sports is supported by multiple studies in various sports (Carlson, 1988; Gullich & Emrich, 2006; Hume et al., 1994; Lidor & Lavyan, 2002; Moesch et al., 2011). Not only does the sport diversification approach enhance the athletes' physical development, but also avoids physical hindrances presented by sport specialization. Multiple participants (2, 4, 5, and 9) recognized how previous sport experience has improved the movement capabilities of their athletes, with some coaches stating their athletes who have sampled multiple sports may experience fewer injuries in comparison to their single sport peers. This matches the research findings of various studies (Feeley et al., 2016; Jayanthi et al., 2012; Malina, 2010). It is interesting to note coaches recognized the diminishing impact of physical education in schools, and how the loss of physical education programs negatively impact youth movement and motor development. Participant 7 recognized how other sports may provide exercises their program cannot fit into practice but may benefit the athlete in both sports. Participant 2 pointed to previous sport experiences as developing an athlete's ability to move on land during their dry land activities.

Additional coaching responses supported by research were within the psychosocial realms (Fraser-Thomas et al., 2005; Fredricks & Eccles, 2006; Strachan et al., 2009; Wilkes et al., 2009). Participant 7 talked about outside activities, saying, "we want them to do something outside the pool ... we want them to stick together ... they should be a team and feel like a team." First, coaches should make efforts to organize many social activities surrounding teams to enhance the social opportunities for children (Côté et al., 2007b), and further, coaches should provide opportunities to learn important life skills through their early sport participation (Fraser-

Thomas et al., 2005). Multiple coaches (Participants 1, 3, 7, 8, and 10) provided examples of developing friendship with teammates outside of swimming, and the importance of being members of a team, with Participant 10 saying “they have a set group of friends, or even another family, because of the time they spend here.” These statements support research done on the accrual of social capital as it relates to sport (Strachan et al., 2009; Wilkes et al., 2009). In addition to the importance of their teammates, some coaches (Participants 1, 3, 7, and 8) spoke about developing habits related to hard work, and the importance of understanding the meaning of hard work. Participant 7 said “I really want them to embrace and enjoy hard work.” Another area coaches (Participants 2, 5, 7, 10) expanded on was the importance of learning from failures, and the importance of failures, with Participant 5 saying “I think failure is great, a learning experience, they need to learn how to deal with failure.” One can argue these areas fall in line with the development of life skills. These life skills include intrapersonal and interpersonal skills which both are developed through sport program (Wilkes et al., 2009). The argument can be made that the development of problem solving through failure can be related to both inter and intra-personal skills.

The most staggering difference between the research suggestions in sampling years and the interview responses was in the amount of time the youth swimmers are asked to practice. Côté et al (2007b) believed coaches should ensure youth athletes are not engaged in one sport for more than four hours per weeks. Coaches should respect the need for children to sample, a variety of sport and non-sport activities, and therefore should refrain from scheduling practices/games in one youth sport so frequently it comprises other opportunities for children (Baker et al., 2003; Côté 1999; Côté et al., 2007b). When coaches provided practice volume, all

coaches exceed ten hours per week, with some suggesting up to twenty hours of practice.

Participant 2 said:

The swimmers in my group ... we swim up to seven times a week for two hours plus dry land, so after that there is not a ton of time, and part of that commitment is to be their five times a week for two hours

These time frames, in conjunction with enrollment in school, surely limit a youth athlete's ability to accomplish necessary work for school, participate in swimming and add additional activities. The reason for this appears to be the goal of the coaches and athletes to develop into elite athletes through early specialization.

Research has found in sports where peak performance is achieved before puberty early specialization is often necessary to reach elite performance (Côté et al., 2007a), and a variety of studies support early specialization as suitable (Abernathy & Russell, 1987; Ericsson et al., 1993; Law et al., 2007). Coaches alluded to the path to elite performance, and to achieve this maximum performance, additional hours of training are necessary. Participant 3 said of specializing solely in swimming that "the positive effects of focusing solely on swimming, that list could be endless" while Participant 11 said "when they focus only on swimming, and can give all their attention and energy to that sport, they can connect to it more ... they're not worried about other practices they have to go to." As Law et al., (2007) pointed out, elite performers usually skip sampling years, and consequently do not always experience the enjoyment associated with sampling and play. It does not appear these coaches see their athletes enduring negative experiences within their sport practices. This notion is also supported through their clubs achievements, as gold, silver and bronze medal clubs, recognized as the highest

achieving USA Swimming Clubs in the country. It is reasonable to believe their athletes move through these programs and continue to experience great deals of success.

One possible explanation for coach's supporting their athletes focusing solely on swimming is the business models of youth sport and the systems in place within their clubs and programs. Within this sample, one can argue all of these coaches are employed in programs supporting the early specialization track. Fraser-Thomas et al. (2008), In their study of adolescent competitive swimmers, found participants in swimming were exposed to highly structured practices at a very young age, suggesting this form of training may be innate within the structure of competitive swimming. This means these athletes may specialize at a younger age with the purpose of achieving peak performance at a younger age, which may be more prevalent in the sport of swimming than in other sports. This dynamic appears to lead these coaches to further support the notion of sport specialization because their athletes have already made the decision to specialize due to the structure of the sport. This orientation towards sport specialization within the club swimming programs, and potentially youth sports at large, may be due to the coach's and programs dependence on membership dues. As stated above, the business model of these programs and systems may be a driving factor in this trend of youth sport participation. The coaches and programs depend on the membership dues and fees paid by the athlete families for their salaries and livelihood, and therefore the increased rates of participation and sole attention on their sport may be a primary factor in the perspectives of these coach's and others.

Despite this observation, some coaches did make mention of athletes who transition away from the competitive nature of swimming and opt for the recreational approach to swimming. Participants in recreational years, often labeled as after thirteen years, may have elected not to

pursue an elite development trajectory in sport but remain involved because they see it as an outlet where they can continue fun and challenging competition (Côté et al., 2007b). An example provided by Participant 9 was athletes who may not excel at the highest level of the sport, but still continue for the purpose of triathlons or simply because they enjoy the camaraderie of the sport, by saying “she’s not in the upper percentage of what I see being a top swimmer, but she does triathlons, so I encourage her to keep swimming because she is so good at triathlons and she wins everything.”

Taking a closer look at the track of early specialization, this route addresses many of the instances where the coach’s responses did not line up with research pertaining to the DMSP, and matches the research on the privatization of youth sports. Although most adults are well intentioned, the youth sport organizations inevitably impact the dynamics of coaches and their families and their fiscal dependency on youth sport. The teams are managed by coaches whose success and financial stability is dependent on team member’s year-round membership dues, participation, and team success. All of these swimming organizations rely on pyramidal membership, with a broad base of swimming lesson and developmental participants occupying the bottom level, and national caliber athletes at the senior level, matching the program structures explained by Stewart and Shroyer (2015). This dynamic is beneficial when athletes progress from the base through age group programs and eventually transition into fully committed senior members.

Within the conversation on the early sport specialization track, it is important to discuss how these programs structure their teams in order to streamline athletes towards the track of elite performances. Seven of the coaches (Participants 2, 3, 4, 5, 7, 8, and 9) interviewed specified their groups as on an elite path within the program, meaning they have identified their athletes

prior to joining the groups. This means prior to joining their current group they were targeted and selected by parents or a coach to join the elite path. With nine of eleven coaches working with athletes beginning younger than the age of thirteen, this selection must happen at a fairly early age (aged twelve at the latest). This means at least nine of the programs involved in this study are working along the path of early sport specialization. Again, with the structure of their programs, and the importance placed on dedicating considerable time and energy to the sport of swimming, it seems the overwhelming message from these coaches is in support of early sport specialization in terms of being an ideal path for development. Due to the path of early specialization, these coaches ask the athletes to commit to considerable volumes of training and practice from a young age.

Recommendations

This study brings attention to the growing trend of early sport specialization. The programs the participants are employed by are geared towards guiding youth swimmers to an early track of sport specialization, eliminating sport diversification at younger and younger ages. From the standpoint of the researcher, this pattern is neither positive nor negative, but instead is a sign of where the sport of swimming in the United States is trending. Instead of encouraging athletes to contribute more and more time at younger and younger ages, other paths could be investigated. Based upon these findings, the suggestions of the researcher are as follows:

1. Aim to shift the structure of youth sport programs membership goals.
2. Develop youth athlete's movement patterns over training volume.

The first point has been touched on numerous times through the discussion, and was initially introduced during the literature review of the growth of sport specialization. With the growth of youth sport programs and the privatization of youth sport, many adult coaches are dependent on

a single sport and their members for financial support. Organizations such as the YMCA and Boys and Girls Clubs promote participation in multiple activities, and have long stood the test of time, proving the sustainability of programs who promote participation in multiple activities. Youth sport programs can look to develop more than one type of athlete in a single sport by promoting programs similar to the YMCA and Boys and Girls Clubs. If youth sport programs of the future work to include a variety of sports, and/or promote a schedule enabling youth athletes to participate in other activities, then the trend of early sport specialization can be skewed to begin later.

The second recommendation targets a change in training style in general. Specific to swimming, the importance placed on the amount of time training and overall volume of training could be substituted with a greater focus on technique and skills. If the structure of a training week were altered to limit the amount of time and volume of training, it could be replaced with higher quality teaching. All of the participants coach with programs recognized by USA Swimming as high achieving clubs, with some of the coaches being recognized, through certification level, as highly educated. One would believe altering a training model is something where, if any coach and club would be capable of leading, these coaches would be able to do so. That being said, young swimmers must also build the baseline ability to train and this cannot be ignored. The balance between the importance to train and the need to develop skills and technique, with the freedom to participate in a variety of activities, is not easily simplified.

Limitations

The first limitation of this study is the small number of participants; however, the researcher believes saturation was achieved. The eleven coaches represent eleven teams of 200 gold, silver, or bronze medal clubs in the country, and 2,800 total USA Swimming clubs.

Therefore, the sample size is small. A second limitation is the geographic location the coaches. The coaches were primarily from the southern and eastern zones, with only six total states represented. The experience of teams located in warmer weather states where year round swimming is more prevalent presents a narrow experience. A third limitation is the length of interviews. Only one interview extended beyond thirty minutes, with three taking less than twenty minutes. Coaches were asked to participate in thirty minute interviews due to their busy schedules. The researcher believed asking for a longer period of time would deter potential participants. Despite all questions being answered and topics being discussed, a full view of the coach's thoughts, feelings, opinions and perspectives on sport specialization and sport diversification may be limited.

Conclusion

The purpose of this study was to investigate coach's perceptions of sport specialization. Despite the evidence in support of sport diversification over sport specialization, this study concluded coaches involved in youth swimming overwhelmingly support the path of early sport specialization. All eleven coaches acknowledged the role of other sports in the development of their athletes, but all eleven continued with explanation to why their athletes may not, or cannot, partake in other sport or general activities. Sacrifices connected to sport participation were discussed in all eleven interviews, and included both the loss of sport variety, and social sacrifices, often times connected to the same reasons athletes may not, or cannot, find time to participate in other activities. The majority of coaches suggested a need for control over their athletes, both in terms of their physical activities and spare time outside of school and sport. A possible explanation for these findings is many coaches are working within programs specifically designed and constructed to funnel athletes through the sport on the track of early sport

specialization in hopes of achieving increased performance standards. From the standpoint of the researcher, this is neither positive nor negative, but instead is a sign of where the sport of swimming in the United States is moving. One quote stood out to the researcher, as one of the participating coach's spoke of their own kids, who also participate in swimming. The coach said, "Just watching my kids grow up and watching what some of these kids have done growing up in the program, and where they are now, I start to wonder if this sport is to serious?"

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Appendix

Appendix A: IRB Approved Email Introduction

Hi **(Participant Name)**,

My name is Sam Davy, I am conducting a study examining perceptions of age group coaches regarding sport specialization and optimal athlete development in swimming. To do so, I hope to conduct interviews with age group swimming coaches.

I'm reaching out to you because you are an age group swimming coach. If you are available, I'd like to interview you regarding your perceptions of sport specialization and optimal athlete development. The interview shouldn't take longer than 30 minutes.

This study requires your consent, and should you be willing to participate, I will send you the necessary informed consent forms further detailing the study via e-mail.

Thanks for your time, and I hope you will be able to assist me in this research as it will benefit the swimming profession and add to the current literature on the topic of sport specialization.

Should you have any further questions now or at any point of the study, the researcher, Sam Davy, can be reached by e-mail at sdavy@vols.utk.edu, or by phone at (715) 340-8138.

Sincerely,

Sam Davy

Appendix B: IRB Approved Informed Consent

University of Tennessee, Knoxville

Informed Consent Script

Optimal athlete development and coaching perspectives in age group swimming

INTRODUCTION

You are invited to participate in a current study of the perceptions of age group coaches regarding sport specialization and optimal athlete development. The study involves research and is being conducted to examine the perceptions age group coaches regarding sport specialization, the optimal development of athletes, and your personal opinions on these topics.

PARTICIPANT INFORMATION

Pending your consent, you will take part in a one-on-one interview with the researcher that should take no longer than 30 minutes to complete. Interviews will be conducted over the phone. You will be asked questions pertaining to your perceptions regarding sport specialization and optimal athlete development. The interview will be digitally recorded and stored on a password protected computer. Once all interviews are completed, the researcher will transcribe the conversations verbatim and analyze the content with qualitative data analysis software. The digital recordings will be securely stored and only accessed by the research team. At the conclusion of the study, the recordings will be destroyed.

RISKS

There are minimal risks associated with participating in this study. For example, you may be asked questions about your coaching style that may make you uncomfortable. At any point you are uncomfortable with participating in this study you can exit the study without penalty or consequence. Most studies involve some risk of their confidentiality and it is possible that someone could find out they were in this study and see their study information. All measures will be taken to protect your identity and keep your responses confidential. A pseudonym or code will be assigned to you that will help to protect your identity.

_____ Initials

BENEFITS

This study may benefit the both coaches and swimmers involved in the sport of swimming, as well as the swimming community at large. There are no anticipated direct benefits to you from participating in the research

CONFIDENTIALITY

The information collected during interviews will be kept confidential. Data will be stored securely on a password protected computer and will be made available only to the research team. You will be referred to in the study but never identified by your legal name, only by a pseudonym.

CONTACT INFORMATION

Should you have any further questions now or at any point in the study, the principal investigator, Sam Davy, can be reached by e-mail at sdavy@vols.utk.edu , or by phone at (715) 340-8138. Also, the faculty advisor, Rob Hardin, can be reached by email at robh@utk.edu . If you have questions about your rights as a participant, contact the University of Tennessee, IRB Compliance Officer at (865)974-7697 and at utkirb@utk.edu.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

CONSENT

I have read the above information. I have received a copy of this form. I agree to participate in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix C: IRB Approved Interview Guide

1. Introduction

- a. **Before being hired for your current job, what other positions have you held and what were some of your responsibilities?**
 - i. The reason I am asking this question to start conversation. This allows the interviewee ease into the interview by talking about their experiences.
 - ii. *Potential follow up: How did you start coaching?*
 1. I would need to ask this question is if it is unclear how they transitioned from previous positions into their current coaching position.
 - iii. *Follow up: How many years of experience do you have coaching?*
 1. I would ask this to have a tangible number to compare coach's perceptions compared across experience.
- b. **What coaching certifications, if any, do you hold? If yes, what level is your certification?**
 - i. I will ask this to compare coaches using another tangible measure. This will allow me to compare perceptions based on education.
- c. **What is your primary group you coach?**
 - i. I will ask this question to understand the coach's target age group. A coach will approach 8 and under different than 13-14, meaning they could perceive sport specialization differently depending on the group they coach.

2. Coaching philosophy

- a. **How do you coach your group? Why do you coach it this way?**
 - i. This question is included as the start of coaching philosophy because it is open ended allowing the interviewee to shape their answer in a personal way.
- b. **What is your primary goal for a season? (Examples if needed: Development? Championship season? Best times?)**
 - i. I am including this question to gain perspective on the coach main goals for a season. If the coach focuses on developing champions verse

developing the athlete, there may be connections to favoring sport specialization or not.

c. How would you describe your role as the coach of your swimmers?

i. This question is important because it opens up questions about how the coach influences the swimmers decision making outside practice.

ii. *Potential follow up: How do you try to support your swimmers?*

1. If the coach views their role as being a part of decision making for the swimmer outside the pool and practice, they may perceive how they support their swimmers differently than a coach who views their role as a supporter for the swimmers success in the pool.

iii. *Potential follow up: Do you put any pressure on your swimmers?*

1. I included this as a potential follow up because, as with the question above, if the coach views their role as a player in decision making they may put pressure on the swimmer to make decisions which they believe is best for their coaching career instead of for the swimmer.

d. What do you think makes a good swimmer?

i. This is included because it provides background into what a coach views a swimmer should prioritize, such as a time commitment or training volume. It also allows them to explain alternatives to sport specialization.

3. *Specialization Specific*

a. What do you believe sport specialization entails?

i. I believe this is a strong question to start for sport specialization specific questions because it can provide context for the coach's opinions going forward. If a coach views sport specialization as training in one sport exclusively verse focusing on one sport over others an athlete participates in, it can dictate how future questions are answered.

b. That you're aware of, have your swimmers made sacrifices to continue participation in swimming? If yes, what are those sacrifices?

- i. This builds off the previous question, asking the coach for specific examples from their program where a swimmer may have sacrificed other activities to exclusively train in the sport of swimming.
- c. What roles do other sports play in the development of your swimmers?**
- i. I included this question because it can provide insight to a coaches perspective on an athletes decision to play other sports, and also give the coach an opportunity to provide examples from their team of athletes who succeed in multiple activities
 - ii. *Follow up: Do you believe your swimmers should participate in only swimming?*
 - 1. I believe this question is a strong follow-up question regardless of how the question above is answered. A coach may believe other sports play no role in their development as swimmers, but also believe their athletes should play other sports, and vice versa.
 - 2. *Follow up: If yes, at what age should they exclusively train for swimming?*
 - a. This question provides a tangible number to discuss. It will be interesting to see what age a coach believes is important for sport specialization, if any.
- d. What are the positive effects of swimmers focusing solely on swimming?**
- i. This question will provide direct insights into why a coach may support sport specialization.

Vita

Sam Davy was born in Stevens Point, WI, to the parents of Nadine and Timothy Davy. Growing up, Sam played soccer, football, basketball, swam and ran track. Sam attended school in the Stevens Point Area Catholic School system from kindergarten through the ninth grade, before transferring to the Stevens Point Area Senior High School. In high school, he was a three-sport athlete, playing soccer, swimming and running track. After high school graduation he attended college at the University of Wisconsin Stevens Point where he competed at the national level as a collegiate swimmer for four years, and studied health promotion and wellness. Following college graduation he educated himself in a variety of different parts of the country, with numerous coaches, including at the Longhorn Swim Camp in Austin, Texas, at the YMCA of Dane County in Madison, Wisconsin, at the Harvard Swim Camp in Boston, Massachusetts, in Seattle and Los Angeles at Peak Performance Swim Camps, and at The Ohio State University in Columbus, Ohio. For the past two years, Sam has worked as the Director of Quality Control for the University of Tennessee, Knoxville, swimming and diving programs, and as an assistant coach for the senior national training group at Tennessee Aquatics. He graduates in May of 2017, and will be moving with his fiancée to Philadelphia, Pennsylvania where he will continue his coaching and education journey.