

The Relationship Between Sources of Information and Perceived Competence Across a Sports
Season: A Planned Missing Data Approach

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Abstract

This study explores the effect of various sources of information on youth athletes' perceived competence across a sports season. Of interest was how relationship variables (e.g., parent, peer and coach) and motivational variables (e.g., task and ego orientation) affected perceived competence at three-time points during a sports season. Two studies were conducted: A meta-analysis was undertaken to determine current understanding of these relationships within published research literature, and a quantitative study of 182 youth athletes (95 male, 87 female), ranging in age from 6 to 17 years, with an average age of 11.82 was conducted, using a planned missing data design. Both the meta-analysis and the quantitative study found task and ego orientation to have a positive relationship with perceived competence. Results from the meta-analysis also suggested that ego orientation may be differentially related to perceived competence as a function of culture (i.e., individualistic vs collectivist). The quantitative study looked at both between and within-person variability across a sports season. Results suggested that while relational and motivational variables were related to perceived competence in expected ways, perceived competence was also sensitive to changes, relative to the average, of both relationship quality and motivational variables, across a sports season. Results of the present thesis can be used to educate both coaches and parents as to the complex role that significant relationships and motivational climate play in understanding perceived competence in youth athletes.

Keywords: Perceived competence; goal orientations; motivational climates; relationship quality; multi-level model; planned missing data; three-form design.

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The relationship between sources of information and perceived competence across a sports season: A planned missing data approach

Sports participation is recognized as having a role in promoting achievement and preventing risk behaviours in youth (Janssen & Leblanc, 2010). Eime, Young, Harvey, Charity, and Payne (2013), found, in their systematic review, that sports participation alone had the highest number of positive developmental outcomes. Specifically, sports participation had more developmental benefits than nonparticipation or other types of extracurricular activities. These benefits include being physically active (Engström, 2008; Janssen & Leblanc, 2010), improved cognitive performance (Chang et al., 2015; Furley & Memmert, 2011) and improved psychological well-being (Donaldson & Ronan, 2006; Eime et al., 2013).

These benefits are important to parents when enrolling their children in extracurricular activities. Parents report that 84% of Canadian youth in the 3-17 age range participate in sports of some kind, and 60% do it on an organized basis (“Massive Competition in Pursuit of the \$5.7 Billion Canadian Youth Sports Market | SRG,” 2014). Parents might have specific reasons for selecting a particular sport to enroll their children in: hockey for developing self-confidence; or tennis so that the whole family can participate in together (Schwab, Wells, & Arthur-Banning, 2010).

Children and adolescents, on the other hand, report different reasons for playing sports that can be grouped into four categories: competence, affiliation with friends or a team, to be physically active and to have fun (Schwab et al., 2010). In a review of the sport literature, Bailey, Cope, and Pearce (2013) found that children’s motivation for participating in sports was mediated by five primary factors: (1) perceptions of competence, (2) fun and enjoyment, (3) parents, (4) learning new skills and (5) friends and peers. In both of these studies, children and

adolescents reported the importance of competence as a reason for participating in sport. Childhood and adolescence are primarily about developing competence across many domains (Harter, 2006; Nicholls, 1978).

Perceived competence refers to children and adolescents' confidence that they have the ability, or will be able, to accomplish the task at hand (Nicholls, 1978; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). Youth athletes who have higher perceptions of competence are more likely to participate (Rottensteiner, Tolvanen, Laakso, & Konttinen, 2015), will attempt more difficult tasks (Nicholls, 1984), and are more likely to persist even in the face of failure (Nicholls, 1978, 1989). In contrast, youth with lower perceived competence see themselves as having less ability, expect failure, and are more likely to drop out of sports (Cervelló, Escartí, & Guzmán, 2007; Felak, 2011; Ommundsen & Vaglum, 1997).

The purpose of the present thesis was to understand the factors that influence the development of perceived competence across a sports season. As noted above, youth athletes who have higher levels of perceived competence report better psychological outcomes and enhanced sport enjoyment. Sport enjoyment is critical to a comprehensive understanding of positive affect and its relation to continued sports involvement.

Perceived competence is directly predictive of sports continuance. Higher levels of perceived competence predicted sports commitment in male soccer players at various levels of competition (Al-Yaaribi & Kavussanu, 2018). Sports commitment is the psychological desire to continue participation with the current team. Higher levels of perceived competence also predict higher levels of autonomous motivation using Self-Determination Theory (Rottensteiner et al., 2015). Using a prospective design, Rottensteiner and colleagues (2015) found that youth athletes who reported higher levels of perceived competence also reported higher levels of both

integrated and identified regulation towards sports compared to youth athletes with low perceived competence. Integrated regulation describes an athlete's behaviour that is perceived as essential and coherent with other aspects of his or her sense of self (Deci & Ryan, 2000; Ryan & Deci, 2000), while identified regulation describes an athlete's behaviour that is chosen because it is perceived as personally necessary (Deci & Ryan, 2000; Ryan & Deci, 2000).

Youth athletes in the third and fourth grade with high perceived competence also reported higher autonomous motivation for sports (Bardid, De Meester, Tallir, Lenoir, & Haerens, 2016). However, what made this research study interesting was that Bardid and colleagues (2016) had also measured actual motor competence for these youth athletes. Using cluster analysis, the youth athletes were divided into four groups. Two groups were characterized by similar levels of actual and perceived motor competence (i.e., low-low and high-high) and two groups that were characterized by different levels of actual and perceived motor competence (i.e., high-low and low-high).

The researchers found that youth athletes in groups with relatively low levels of perceived motor competence (i.e., the low-low group and the high-low group) had significantly lower autonomous motivation for sports than youth athletes in the groups with relatively high levels of perceived motor competence (i.e., low-high and high-high). This relationship was independent of whether youth athletes had high or low actual motor competence highlighting the importance of perceived competence in children's motivation to engage in sports. The fact that perceived competence, as opposed to actual competence, is related to youth athletes' positive outcomes suggests that understanding how perceived competence develops over time is critical for understanding children's definitions of success in achievement settings, whether that be in sports, academics or social domains.

In the present research, I initially conducted a meta-analysis (Study 1) to understand the relationships between goal orientations, perceived motivational climates and perceived competence. Next, in Study 2, I investigated the relationship between perceived competence and sources of competence information, motivational variables and relationship variables, across a sports season from a developmental perspective using Harter's Theory of Construction of the Self and Achievement Goal Theory (Harter, 1999, 2012b). Motivational variables of interest were goal orientations (i.e., task and ego orientations), and motivational climate (i.e., perceived mastery or performance climates for both peers and coaches) while the relationship variables of interest were the quality of the relationship with parents, coaches and friends.

Study 2 is different from most other studies looking at these relationships because youth athletes completed a questionnaire across three-time points during the sports season as opposed to a single time point as was done in most of the studies looking at these relationships. Collecting data across the sports season allows the relationships of interest to be viewed from the perspective of both within-person mechanisms and between-persons differences (Howard, 2015).

Development of the Self

The interest in the self can be traced back to Greek philosophy. However, it was not until 1976 when Shavelson developed an influential model with references to the educational context that the self was construed as a hierarchy. This model consisted of four life domains: physical, social, emotional and academic selves. Researchers have subsequently developed different models representing the self-system, such as Harter's (1999, 2012) Self Theory. Central to most of the approaches to this idea is that the self is a complex arrangement of constructs that make up the self-system.

Self-esteem, or self-worth, resides at the apex of a self-system composed of perceived competencies in specific life domains. For researchers who are focused on the development of perceived competence across childhood and adolescence, these self-structures serve to shape goals and to provide self-guides that aid in the appropriate social behaviour and self-regulation. Self-esteem and domain-specific perceptions influence engagement and persistence decisions of various life pursuits, including physical activity, such as sport and exercise (Harter, 2006). According to Susan Harter (2012), across the life-span individuals develop a self-theory, that is both a cognitive and social construction.

Self as a cognitive construction. When the self is considered as a cognitive construction, the focus is on the cognitive-developmental changes that occur, resulting in changes in the structure of the self-system, specifically how self-representations are organized. In very early childhood, children younger than five years old, have very positive self-concepts based upon concrete, observable characteristics, consistent with their cognitive abilities. They describe themselves based upon physical attributes, such as having brown hair, material possessions, such as living in a house, behaviours, such as running fast, and preferences, such as liking ice cream. Researchers have described young children as having a behaviourally presented self-esteem. This means young children demonstrate high levels of self-esteem through displays of confidence, curiosity, initiative and independence (Harter, 2003, 2006).

In early childhood, starting around 5 to 7 years of age, children begin to engage in some comparisons. Children this age begin with temporal comparisons. Specifically, they compare their current abilities to when they were younger. They can make basic social comparisons, but this is primarily to confirm fair treatment, such as getting a turn at the craft table. Children still have very positive self-concepts that are unrelated to actual abilities. It is not until children

develop the cognitive abilities that allow them to apply comparative assessments with their peers that their self-evaluations become more realistic (Harter, 1999, 2006). This means that younger youth athletes would have higher perceived competence compared to older youth athletes.

The ability to engage in social comparisons with peers for evaluation begins in middle to late childhood when children are 8 to 11 years old (Duda, 1987; Nicholls, 1978). Research findings suggest that the primary reason/motivation for children in this age period is to utilize social comparison for personal competency assessment and this is supported by the social environment, as social comparison becomes a basis for success. Social comparison is supported when coaches provide differential attention and positive reinforcement to athletes who are competent and instrumental in winning, and skill development is considered more critical to winning than personal improvement and self-actualization. Social comparison becomes especially salient if the coach responds with punitive responses to mistakes and poor performance (Harter, 2006, 2012b).

This new cognitive ability for peer-comparison along with the penchant to compare the self with others makes these children's self-construct vulnerable in the valuable domains, such as athletic competence (Harter, 2006, 2012b). Now that children are organizing their self-evaluations as higher-order traits and not behaviours, they may be more resistant to disconfirmation. This means that if children and adolescents have high ability but low perceived competence in sports, it might not be possible to change their perceptions to match their abilities.

De Meester et al., (2016) found that 51% of male and female adolescents ($M_{age} = 13.64$, $SD = 0.58$) incorrectly perceived their motor competence when compared to their actual motor competence. Adolescents who had high perceived competence were significantly more autonomously motivated to engage in physical activity and sport compared to peers with similar

levels of actual motor competence who accurately perceived their competence. Higher perceived competence, but not actual competence, was predictive of higher levels of physical activity and sports (De Meester et al., 2016). This finding that less than 50% of the adolescents in this study could accurately perceive their competence further supports that more research is needed in understanding the development of perceived competence across a sports season.

Middle adolescence is also the time when adolescents become extremely preoccupied with the opinion and expectations of significant others in different roles. As the number of roles increases, such as student, worker and romantic partner, this leads to messages from significant others that are potentially contradictory, that can lead the middle adolescent to distress and confusion about which characteristics to adopt (Harter, 2006). This contradictory feedback can also contribute to a lowering of perceived competence between early and middle adolescence, as youth realize, that they cannot meet the expectations of everyone in each relational context, at home, school or on the sports team.

These cognitive-developmental advances during middle adolescence can lead to distortions in the interpretation of the opinions of significant others, resulting in excessive or unrealistic differentiation. As children and adolescents develop the ability to make self-comparisons that are more accurate, they use the feedback from the perceived motivational climates from peers and coaches to help determine their perceived competence. Nicholls' (1978) achievement goal theory focuses on understanding children's explanations, or attributions, for their successes and failures and how these attributions influence subsequent motivation.

Achievement goal theory. Achievement goal theory (AGT) emanates from work in the educational domain, with theorists proposing that individuals' achievement goals are critical determinants of motivation-related cognition, affect and behaviour (A. L. Smith, Balaguer, &

Duda, 2006). For example, Nicholls (1978) found that children's perceived competence played an organizing role in causal attributions. Children who were high in perceived competence were more likely to select and participate in achievement activities, attempt difficult tasks and persist despite failure. In contrast, children who were low in perceived competence saw themselves as low in ability and expected failure that they attributed to their low ability. Success was unexpected and attributed to effort or luck.

Ability refers to what a person can do, while effort is a measure of how hard an individual has to work to succeed. Nicholls (1978) found in academic settings that children are not able to differentiate effort from ability until around 12 years of age. He contended that two concepts of ability manifest themselves in achievement contexts for individuals 12 years and older; namely, an undifferentiated concept of ability, where the individual does not differentiate ability and effort, and a differentiated concept of ability, where ability and effort are differentiated. Once children can differentiate effort from ability, high levels of effort are associated with low levels of ability. Youth athletes who observe another player engaging in high levels of effort to learn a task could perceive that player as being low in ability.

Although there is a developmental trajectory with regard to the capacity to differentiate between effort and ability, reaching this developmental stage does not necessarily dictate that a differential concept of ability will automatically be invoked. That is, children can choose to utilize either a differentiated or undifferentiated view. It is not until early adolescence that children can begin to accurately perceive their competence (Harter, 2012b; Nicholls, 1978). Younger athletes use a self-referenced system and typically overestimate their competence. Older athletes can select their approach (i.e., goal orientations) to learning new skills and informing their perceived competence. Older athletes can attribute their success to effort and

hard work (i.e., a mastery approach) resulting in higher perceived competence or solely to ability (i.e., an ego approach) which could result in lower perceived competence.

Goal orientations. Goal orientations, mastery or performance, refer to the broad approaches children and adolescents take to their learning (M. Fry & Duda, 1997; Wigfield et al., 2006). This perspective is in contrast to goals for specific activities, although goal orientations can influence the approach a child or adolescent takes to a specific task. Task orientation refers to the child or adolescent who is focused on improving their skills, mastering the material and learning new things (i.e., the young athlete who spends hours shooting a puck at the net for fun). On the other hand, a child or adolescent who has an ego orientation will focus instead on maximizing favorable evaluations of their competence and minimize negative evaluations of their competence (i.e., the athlete who spends hours shooting a puck at the net in order to not be the worst shooter on the team).

Task. Youth athletes who are task-oriented are focused on improving their skills, mastering the material and learning new things. High levels of task orientation are predictive of enjoyment (Boyd & Yin, 1996), pleasant psychobiological states (Bortoli, Bertollo, Comani, & Robazza, 2011; Bortoli, Bertollo, & Robazza, 2009), sports continuance (Atkins, Johnson, Force, & Petrie, 2014) and higher levels of perceived competence (Atkins et al., 2014; Rottensteiner et al., 2015). Additionally, youth athletes who have a self-theory that is task-oriented believe that success is due to the desire to work hard and do one's best which places the antecedents to success under one's control (Duda, Fox, Biddle, & Armstrong, 1992).

Ego. Youth athletes who have an ego goal orientation will focus instead on maximizing favorable evaluations of their competence while minimizing negative evaluations of their competence. Ego orientation is a positive predictor of poor sports behavior and a negative

predictor of good sports behavior (Davies, Babkes Stellino, Nichols, & Coleman, 2016). Good sports behaviors refer to positive interactions, respect for others and the rules of the game, whereas poor sports behaviors refer to negative interactions with the environment and those involved, as well as a lack of respect for the rules (Bortoli, Messina, Zorba, & Robazza, 2012).

While task orientation is positively associated with perceived competence, the relationship between ego orientation and perceived competence is not as clear. In some studies, higher reported levels of ego-orientation were related to higher levels of perceived competence (Rottensteiner et al., 2015) while other studies did not find a significant relationship between ego orientation and perceived competence (Feichtinger & Höner, 2014). Youth athletes who reported a high ego-orientation had a different perception of success compared to youth athletes with high task orientation. Youth athletes with high ego orientation were concerned with showing superior competence and were more likely to believe that success stems mainly from the possession of high ability. Ego orientation was also linked to an endorsement of work avoidance (Duda et al., 1992)

Goal orientation profile groups. In AGT, task and ego orientation are considered to be orthogonal constructs (Nicholls, 1984, 1989). In their meta-analysis, Lochbaum, Çetinkalp, Graham, Wright, and Zazo (2016), found support for task and ego orientation being orthogonal since they shared only 3.24% of their variance. Researchers frequently use cluster analysis to group athletes based on their goal orientation profiles (e.g., high task-high ego, high task-low ego, low task- high ego, low task-low ego).

High task orientation can buffer the effects of high ego orientation. Young male soccer players who reported relatively moderate ego orientation coupled with relatively low task orientation were lower in perceived competence than soccer players reporting relatively high ego

orientation coupled with relatively moderate task orientation (A. L. Smith, Balaguer, et al., 2006). Young female youth soccer players who perceived themselves as high in perceived ability and were high in task orientation perceived significantly greater enjoyment in playing soccer regardless of their ego orientation (Stephens, 1998).

A critical caveat to Nicholls' AGT (1978) is that the two-goal orientations are orthogonal. It is not necessarily the case that one is predominant. For example, Smith, Balaguer, and Duda (2006) were interested in whether or not youth athletes would report combinations of mastery- and performance- goal orientations since these are considered to be orthogonal constructs. Using a sample of 233 male soccer players, ranging in age from 9 to 12 years, the researchers found four clusters of achievement goal orientations: low-performance/high-mastery, high-performance/low-mastery, high-performance/moderate-mastery and moderate-performance/low-mastery.

Significant differences were found for adaptive behaviours between the low-performance/high-mastery group and the high-performance/low-mastery group. However, there were not any significant differences between the low-performance/high-mastery group and the high-performance/moderate-mastery group. This finding suggests that relatively high levels of performance orientation are not maladaptive when coupled with at least relatively moderate levels of mastery orientation.

Perceived motivational climate. Similar to goal orientations, motivational climates created by coaches or peers can be mastery or performance-oriented. Mastery climates emphasize personal effort, or improvement, and working with others to develop skills. Mastery climates foster self-referenced forms of ability, such as striving for personal mastery (Smith, Smoll, & Cumming, 2009a). However, in a performance climate, athletes are rewarded and

evaluated based on their abilities compared to teammates. Performance climates promote judgements of competence based on normative comparison.

Perceived mastery climate (both peers and coaches) was predictive of players reported levels of enjoyment (Vazou, Ntoumanis, & Duda, 2006). High mastery climate moderated the relationships between prosocial behavior, enjoyment and perceived competence. The higher the perceived mastery climate, the stronger the positive association between prosocial behavior and perceived competence as well as enjoyment (Al-Yaaribi & Kavussanu, 2018). High perceived performance climate moderated the relationship between antisocial behavior and perceived competence.

Performance climate is a moderator of the negative relationship between antisocial behavior and perceived competence. The higher the perceived performance climate, the stronger the negative association between antisocial behavior and perceived competence (Al-Yaaribi & Kavussanu, 2018). Motivational climates where the focus is on self-improvement, (i.e., mastery) are expected to be associated with higher perceived competence, while motivational climates where the focus is solely on winning (i.e., performance) are expected to be associated with lower perceived competence.

Coach motivational climate. The coach-initiated motivational climate can play an essential role in the experiences of, and psychosocial development, of young athletes. Smith, Smoll and Cumming (2009) used coach-initiated motivational climate to predict changes in 9 to 13-year-old athletes' achievement goal orientations across a sports season. This research utilized a longitudinal multilevel design consisting of 47 youth basketball teams. High mastery climates were associated with significant increases in athletes' mastery goal orientation and decreases in

performance goal orientation. High-performance climates were associated with increases in performance goal orientation.

Female adolescent athletes who reported higher frequencies of positive and informational feedback from their coaches following successful performance attempts, and a greater emphasis on a mastery motivational climate, expressed greater soccer competence, enjoyment and preference for optimal challenge, independent mastery, and intrinsic interest in soccer (Weiss, Amorose, & Wilko, 2009). However, when coaches emphasize a performance climate, specifically emphasizing social comparison and winning and giving the most attention to the best athletes, youth athletes report lower competence, increased worry about performance and lower peer acceptance (Ommundsen, Roberts, Lemyre, & Miller, 2006)

Peer motivational climate. In early adolescence, peers become increasingly important as sources of information for determining one's perceived competence. Peer mastery climate positively and significantly predicted perceived competence (Jõesaar, Hein, & Hagger, 2011). Youth athletes who perceived their peers as creating task-involving motivational climates predicted higher levels of task orientation (Atkins et al., 2014). For 493 adolescent athletes, peer mastery climate was the only perceived motivational climate variable that was a predictor of perceived competence even though the research included peer performance climate and perceived coach master/performance climate (Vazou et al., 2006).

Self as a social construction. When the self is considered as a social construction, the focus is the socialization process that reflects the interactions of children and adolescents with their parents, peers and in this research study, coaches (Harter, 2012b). Starting in early childhood, the child begins by imitating behaviours, attitudes and values of significant others. Next, the developing child adjusts his/her behaviour to garner the approval of salient socializing

agents. Finally, in late adolescence, or emerging adulthood, the individual comes to internalize/incorporate opinions that significant others are perceived to hold toward the self. These reflected appraisals then come to define the individual's sense of self as a person, including their perceived competencies across many domains (Harter, 2003, 2012b).

The role of the opinions of others is paramount in the shaping of the self-concept through social interaction. This social construction occurs in multiple social contexts with different significant others which adds to the complexity of the construction of a self that can be considered as coherent, integrated and authentic (Harter, 2003, 2012b). While parents can enroll children in competitive activities before they display any interest in peer comparisons, achievement contexts, such as sports, will not take on any special meaning until children develop a distinct interest in social comparison.

Typically this interest will be reasonably developed by age seven and continues to develop across childhood (Duda, 1987; Harter, 2012b; Nicholls, 1978). It is not until about age 12 that children can distinguish effort from ability as contributors to performance outcomes (Duda, 1987; Nicholls, 1978). This results in youth athletes shifting from relying predominantly on adults (i.e., parents and coaches) for physical competence information to relying on peers as they approach adolescence. Peer comparison and evaluation become important sources of physical competence information (Amorose, 2002; A. L. Smith, Ullrich-French, Walker II, & Hurley, 2006).

Relationship variables. Parents, coaches and friends are key contributors to motivational outcomes and perceptions of competence in youth sports (Ullrich-French & Smith, 2006). Children who perceive their parents and coaches to be positive role models, to possess more positive beliefs about their competency and to provide more frequent feedback about their

performance successes report higher perceived competence in sport (Babkes & Weiss, 1999). High friendship quality, along with other social relationships, was predictive of higher perceived competence. (Ullrich-French & Smith, 2006).

Parents. Parental involvement has been defined broadly as the amount of time and effort a parent extends in child-oriented activities as opposed to other activities or more accurately, as the dedication to resources by a parent to child within a given domain, as well as the degree to which a parent is interested in, knowledgeable about, and takes an active part in the child's life (Cassidy & Conroy, 2006). In sports, parental involvement can be considered to consist of transportation to and from games; attending games and practices; providing instructional assistance; and purchasing equipment necessary for sport (Holt, Tamminen, Black, Sehn, & Wall, 2008; Simpkins, Vest, Dawes, & Neuman, 2010).

Cassidy and Conroy (2006), found that for young adolescent athletes ($M_{\text{age}} = 11.3$ years), self-esteem was significantly related to both perceived academic and athletic competence. However, maternal behaviors were only predictive of self-esteem in the academic domain. This lack of maternal behaviours as a predictor might be because children at this age are beginning to use peer comparison more as a source of information for their perceived competence (Cassidy & Conroy, 2006).

Parents who are heavily invested in the team, i.e., over-identified, might perceive their children's goal orientation based upon the competitive level of the team. Bergin and Habusta (2004) found that parents of male hockey players who played competitive hockey perceived their sons as having a higher performance orientation than parents whose sons played recreational hockey. This finding was interesting because there were no significant differences in reported

performance orientation between hockey players on either the competitive or the recreational teams.

When parents are perceived as critical of the youth athletes' performance and have high achievement standards, youth athletes report lower perceived competence, increased worry about performance and perceptions of less peer acceptance (Ommundsen et al., 2006). When parents are not perceived as critical or to have high achievement expectations, youth athletes report higher perceived competence, decreased worry about performance and higher peer acceptance (Ommundsen et al., 2006).

In a study done by Atkins et al. (2014), youth athletes who perceived their parents as creating task-involving motivational climates predicted higher levels of task orientation. Also, higher levels of task orientation predicted higher perceived competence. However, dad, but not mom, initiated mastery motivational climate, where there is a focus on improvement and enjoyment, was predictive of good sport behaviors (Davies, Babkes Stellino, Nichols, & Coleman, 2016).

According to Fredricks and Eccles (2004) research in the sports domain does not (but should) focus on the developmental changes that occur within the child and parent relationship. As children mature, their ability to differentiate ability and effort, along with their increasing ability to incorporate social comparison information, influences how children interpret feedback from their parents (Fredricks & Eccles, 2004; Nicholls, 1978). Young children rely more on adult feedback, while older children rely more heavily on social comparative sources (Fredricks & Eccles, 2004; Nicholls, 1978). As Fredricks and Eccles (2004) attempt to remind researchers, parents are also going through their own developmental changes as their children age (Fredricks & Eccles, 2004).

In summary, youth athletes who perceive supportive parental relationships that encourage a mastery approach report higher perceived competence compared to youth athletes who perceive their parents as being critical or having high achievement standards. In the present study, it was expected that youth athletes who perceive high-quality relationships with their parents would report higher levels of perceived competence.

Friends/Peers. Peer acceptance and high-quality friendships have been linked to psychological well-being (Atkins et al., 2014), social development (Weiss et al., 1990) and moral development (A. L. Smith, 2003; Vazou, Ntoumanis, & Duda, 2005) in sports. A peer can be defined as a person who is equal to another concerning specific characteristics such as skills, education level, age, background and social status. A friend, however, can be defined as a person with whom one has a bond of mutual affection (Fitzgerald, Fitzgerald, & Aherne, 2012; A. L. Smith, 2003). Peer acceptance is generally defined as, the degree of social acceptance, liking or status within the peer group compared to friendship, defined as having close dyadic relationships (Fitzgerald et al., 2012; A. L. Smith, 2003).

Fitzgerald et al. (2012) found in their meta-analysis that friendship quality, peer acceptance and peer crowd affiliation, such as being affiliated with jocks, were all predictive of continued sport participation. Positive peer relations are associated with continued sport participation. Young athletes who report high levels of peer acceptance and friendship quality are more likely to be still playing competitive sports one year later (Ullrich-French & Smith, 2009). Young athletes who report higher quality peer relationships also report higher levels of perceived competence (A. L. Smith, Ullrich-French, et al., 2006), enjoyment (McCarthy, Jones, & Clark-Carter, 2008; McCarthy & Jones, 2007), and self-determined motivation as-well-as lower anxiety

and self-presentational concerns related to sports (Savelsbergh, Kamper, Rabijs, De Koning, & Schöllhorn, 2010).

High-quality friendships and peer acceptance can be a buffer for negative aspects of sports competition. Ullrich-French and Smith (2009) found that as long as young athletes reported high levels of friendship quality and high levels of peer acceptance, high levels of peer conflict did not negatively impact perceived competence, enjoyment or self-determination. Higher levels of peer acceptance were found to be related to lower levels of reported stress (A. L. Smith, Balaguer, et al., 2006). DeFreese and Smith (2014) found that social support from peers was positively associated with well-being, and negatively associated with global burnout and emotional or physical exhaustion across a competitive sports season. However, negative social interactions, such as unwanted advice or intrusion, unsympathetic or insensitive behaviour or rejection, was positively associated with global burnout and emotional or physical exhaustion. Further, negative social interactions were negatively associated with athlete well-being. These findings suggest that peers can both positively and negatively affect sports experiences.

Peer relations, including both peer acceptance and friendships, are important in understanding the development of perceived competence in a sport setting. Children's desire to engage in peer comparison and the capacity to judge their own competence, are considered to be motivational and cognitive markers for readiness for sports competition (Jõesaar, Hein, & Hagger, 2011; Weiss et al., 1990). As a result, peer comparisons become an important source of physical competence information for children, and physical competence has been linked with social competence or acceptance (Moran & Weiss, 2006). Peers can be considered an important source of information in a continuous feedback loop for the development of one's perceived competence. Moreover, while children and adolescents are comparing themselves to their peers,

peers are also providing more direct forms of feedback, by supporting their teammates, or by teasing them when they make mistakes. Amorose (2003) found that the reflected appraisals, where the athlete comes to view themselves as others view them, of sports-others (i.e., teammates) were a stronger predictor of perceived competence.

Researchers tend to combine peers and friends into one construct called peer relations. However, research on performance affect found that close friendships directly predicted positive performance-related affect (A. L. Smith, Ullrich-French, et al., 2006; Ullrich-French & Smith, 2009) while perceptions of peer acceptance indirectly predicted positive performance affect via higher physical self-worth (A. L. Smith, Ullrich-French, et al., 2006; Ullrich-French & Smith, 2009). Smith et al. (2006) found that for models using either peer acceptance or friendship quality as the single peer relationship variable, model fit was exceptional for both males and females. This means that in all cases, the peer relationship variable significantly and positively predicted positive outcomes. Findings such as this suggest that friendship and peer acceptance are independent contributors to psychosocial outcomes. In the current thesis, friends and peers were considered as separate constructs. It was expected that higher friendship quality would be predictive of higher perceived competence.

Coaches. The relationships that youth athletes have with their coaches have a tremendous impact on children's enjoyment and continuation in sport. Coaches influence children's development of perceived competence and achievement goal orientations. Athletes who are given more opportunities to play, and therefore more opportunities to learn, improve and demonstrate skills, are consistently higher in perceived competence compared to athletes who have fewer opportunities to play (Weiss, 1993). In addition to providing athletes with opportunities to play, specific types of coaching feedback are associated with higher levels of

perceived competence. Receiving praise from a coach is predictive of higher perceived competence (Amorose & Smith, 2003; Amorose & Weiss, 1998). Allen and Howe (1998) found that more frequent praise and information after a good performance and less encouragement and corrective information was related to higher perceived competence for female adolescence field hockey players. It was expected that higher coach quality would be predictive of higher perceived competence.

Sources of Competence Information

Children and adolescents utilize a variety of sources, both cognitive and social, for evaluating their perceived competence in the sports domain. Perceived competence has been shown to be influenced by feedback and reinforcement from coaches (Atkins et al., 2014; Horn, 1985; Jackson, Gucciardi, Lonsdale, Whipp, & Dimmock, 2014; Vazou, 2010), parents (Harwood & Knight, 2009; Schwab et al., 2010; Simpkins et al., 2010), peers (Daniels & Leaper, 2006; A. L. Smith, Ullrich-French, et al., 2006; Vazou et al., 2005) and friends (Bailey et al., 2013; Le Menestrel & Perkins, 2007); performance comparison to others (i.e., how well did peers perform); internal criteria (i.e., achievement of self-set goals); and actual performance statistics and outcomes (i.e., goals scored, win-loss record; A. L. Smith, Balaguer, et al., 2006; R. E. Smith, Smoll, Cumming, & Grossbard, 2006).

Although all of these sources of information may be available in the sports context, there seems to be considerable variation in the particular sources of information children are likely to utilize (Horn & Hasbrook, 1987). Some children will rely exclusively on adult feedback, such as from coaches' perceived motivational climate, when forming their perceptions of competence while other children will be more oriented to peer-comparisons, adopting an ego orientation, in determining their performance or competence (Duda, 1987; Nicholls, 1978; A. L. Smith, Ullrich-

French, et al., 2006). This preference for specific sources of information may be a function of goal orientations, perceived motivational climate, relationship quality, age, sex, and level of play.

Age. As children get older, they are more accurate in their perceptions of ability (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Nicholls, 1978) and the sources of information used to assess their ability (Amorose & Weiss, 1998; Halliburton & Weiss, 2002; Weiss, Ebbeck, & Horn, 1997). Hockey players at Peewee (younger) and Bantam/Midget (older) were significantly different in their goal orientations, perceived competence, coach-, parent-, and peer- initiated motivational climate, and on good and poor sport behavior in hockey (Davies et al., 2016).

In a study by Davies et al. (2016), poor sports behaviors were predicted by coach-related motivational climate for younger players, while the peer-related motivational climate was predictive of poor sports behaviors for older players. Specifically, coaches who emphasized a win at all costs mentality had the most negative impact on younger players, while peers with a similar performance focus were more influential on poor sport behavior in older players. Significant predictors of good and poor sports behaviors were adult initiated (dad and coach initiated motivational climate) for younger athletes, while significant predictors of good and poor sports behaviors for older athletes were goal orientations, dad-initiated motivational climate and perceptions of peer conflict (Davies et al., 2016).

Thus, perceptions of social variables explained more of the variance for good and poor sports behaviors for the younger players than older players (Davies et al., 2016). While the influence of others (e.g., dads, coaches) continued to play a role in sport behaviors, self-perceptions became more meaningful, i.e., the extent to which they were task versus ego-oriented in their motivations. This supports the findings that self-perceptions move from

external to internal. In the present thesis, there was a broad range of ages, and it was expected that perceived competence would decrease with increasing age.

Gender. Male and female youth athletes differ significantly in terms of their goal orientations, beliefs about success and perceptions of competence. Males report higher levels of perceived competence compared to females (De Meester et al., 2016; Vazou et al., 2006). Males are more ego-oriented and report greater affect for sports than females. Males are also more likely to believe that motivation/effort, ability and deception/external factors result in sports success than females (Duda et al., 1992).

Females are more likely to attribute effort to success and less likely to believe ability was a determinant of achievement than were males (Newton & Duda, 1993). Females report higher levels of task orientation than males (Newton & Duda, 1993), while males report higher levels of enjoyment than females (Morris & Kavussanu, 2009). Additionally, gender appears to be a moderator for perceived peer performance climate. In a study by Vazou et al. (2005), young male and female athletes did not report any differences in perceived peer motivational climate. However, older male athletes reported significantly higher levels of perceived peer performance climates compared to older female athletes. Stuntz, Sayles, and McDermott (2011) found that perceived support from coaches and peers differed for male and female collegiate athletes based on whether they played on a same-sex or mixed-sex team.

In summary, male and female athletes report different levels of perceived competence, goal orientations and perceived motivational climates. In this thesis, it was expected that male athletes would report higher levels of perceived competence and higher levels of perceived performance motivational climate compared to female athletes. Additionally, it was expected that female athletes would report higher levels of mastery orientation compared to male athletes.

Competitive versus recreational. The level of play, recreational versus competitive, is a vital source of information because the particular achievement goal orientation that a youth athlete adopts might be affected by situational factors present within an evaluation setting, such as a mastery-climate or a performance-climate (Ryska & Yin, 1999). Mastery climates tend to promote positive affect towards the team, more adaptive learning strategies and greater challenge seeking behaviour. In contrast, a performance climate encourages normative, or other-referenced, standards of success, that typically produce lower perceived competence after failure outcomes (Ryska & Yin, 1999). Ryska and Yin (1999) found, using descriptive discriminant analysis, that athletes who perceived their team's motivational climate to be predominantly mastery-oriented were involved in recreational play.

Ryska and Yin (1999) expected that youth athletes who played competitive sports would report higher levels of ego, higher perceived performance climate and lower perceived competence compared to those playing recreational sports who would report higher levels of mastery-involvement, higher perceived mastery climate and higher perceived competence. However, only mastery climate significantly discriminated recreational and competitive athletes. Specifically, recreational athletes reported higher levels of mastery climate, that is a social environment which emphasizes learning, improvement and effort as the keys to success. However, other than mastery climate discriminating level of play, Ryska and Yin (1999) found that there were no differences between recreational and competitive players in perceived competence, performance climate or task orientation.

Not only are there potential on-ice climate differences, but the climate in the stands may vary based upon competitive level. Bowker et al. (2009) found that although the majority of comments at youth hockey games were positive, they did vary as a function of competitive level.

There were proportionally more negative comments made at competitive games compared to recreational games. While most of these negative comments were directed at the referees, Jeffrey-Tosoni and Fraser-Thomas (2015) found that most of the hockey players could hear the spectators while on the ice. Other players reported being able to tune the spectators out. Hockey players reported being able to hear their parents cheering their team on, or the “cowbell that mom brought.” Players reported being able to hear instructional comments that could sometimes be confusing, especially when they conflicted with information from the coach or teammates.

Additionally, players reported negative comments as coming from the other team’s parents. The players described these negative comments in most detail, describing the parents on the other team as sometimes yelling relentlessly at them, causing the players to feel stressed and perform poorly. However, it is important to emphasise that most of the comments (> 50%) made by spectators were positive and directed at the players (Bowker et al., 2009) and that players reported being motivated by such comments (Jeffrey-Tosoni & Fraser-Thomas, 2015).

In summary, in the present research, it was expected that competitive players would report higher levels of ego orientation and lower levels of mastery climates compared to recreational players in this research study. Perceived competence was still expected to be higher in competitive athletes since athletes with high ego orientation, and low perceived competence would be more likely to drop out of sports (Duda & Nicholls, 1992). It was also expected that competitive players would report higher levels of relationship quality compared to recreational players. Competitive players would spend more time with teammates during on- and off-ice practices, games, and travelling to tournaments. Team friends play an essential support role in sport experiences (Le Bars, Gernigon, & Ninot, 2009).

Thesis Overview

Perceived competence is children and adolescents' confidence that they have the ability, or will be able, to accomplish the task at hand (Nicholls, 1978; Wigfield et al., 2006) Higher levels of perceived competence in sport is associated with many positive outcomes: peer acceptance, well-being and continued participation in sport. The current research was interested in understanding the effect of various sources of information on youth athletes' perceived competence across a sports season for both recreational and competitive hockey players through two separate studies. The first study was a meta-analysis which focused on the relationship between perceived sport competence and goal orientations for youth who participate in sports. The meta-analysis was conducted in order to understand the current state of research in perceived competence and on goal orientation for youth who participate in sports. Conducting a meta-analysis along with a quantitative study allows for a cumulative meta-analysis, permitting the researcher to integrate their findings into an existing meta-analysis. The researcher is then able to see how different the effect size in their study is from that of the meta-analysis.

In the second study, youth athletes were recruited to complete questionnaires that asked about motivational variables, such as goal orientations and perceived motivational climate, and their relationships with their parents, coaches and peers. Youth athletes use a variety of informational sources to determine their competence. These sources include coaches, parents and peers and contextual factors such as the level of play that have been found to influence perceived competence. While all these sources of information are available for youth athletes, their state of development impacts which sources children will choose to, or be able to, utilize. Younger athletes are more likely to rely on adult feedback compared to adolescent athletes who are more likely to rely on their peers as sources of information.

Self-structures, such as perceived competence, developed in childhood and adolescence, help to shape goals and provide self-guides that aid in the development of appropriate social behaviours and self-regulation. It is essential to understand the role of perceived competence in children and adolescents' sports experiences when considering the reasons parents enroll their children in sports and the reasons children remain in sports. If the goal is being physically active, youth with higher levels of perceived competence are more likely to continue playing sports, have higher positive self-perceptions and higher levels of intrinsic motivation. In contrast, youth with lower levels of perceived competence are more likely to drop out of sports, have higher levels of perceived stress, lower levels of self-perceptions and display a lack of motivation (Klint & Weiss, 1987; Ullrich-French & Smith, 2009; Weiss, 2000).

There are costs to development since these new cognitive abilities introduce vulnerabilities for the self-system (Harter, 2006, 2012). For example, during middle childhood, children can differentiate their abilities across domains (e.g. the ability to notice that you are better in one area than in others) and compare their performance to that of others. While these advances lead to more realistic evaluations of the child's competencies, there is also the risk that through this social comparison, the child who falls short of others will develop perceptions of incompetence or inadequacy.

The discounting principle is used to minimize the amount of information that influences self-perceptions, or self-esteem, by attaching less value to those areas in life where incompetence or inadequacy prevails (Harter, 2006, 2012). However, some areas carry a high cultural currency that may be too overpowering for a child to discount. These may include being physically active and playing sports. Physical activity is essential for long-term physical health, while sports

competence is associated with peer acceptance (Kipp & Weiss, 2015). Sports participation is considered important in North American culture.

This research is important because most sports research focusses on children who play competitive sports or participate in sports camps. Recreational sports are not studied to any substantial extent in the sports literature, so it is not known to what extent benefits derived from competitive sports generalize to recreational sports. In addition to determining whether competitive and recreational sports provide similar benefits to children, the study investigated which aspects of these programs are most highly correlated with positive outcomes. Results of this research can be used to shape sports programs. By determining features of the programs studied that impacted goal orientation and perceived competence, sports organizations, coaches and parents would be able to adapt their sports environment to maximize the benefits to youth athletes.

Study 1

There were two primary goals of this meta-analysis. The first goal was to examine the magnitude of the relationships between goal orientation, motivational climate and perceived competence in youth athletes. The second goal was to look at potential moderators of this relationship. Country and age were examined as post-hoc moderators of the magnitude of this relationship.

Age was selected as a moderator because the expectation in AGT is that task orientation declines, and ego orientation increases with age (Duda & Nicholls, 1992; Nicholls, 1989). Additionally, the ability to use social comparisons to assess perceived competence accurately increases with age in youth athletes (Harter, 1999, 2012b). It is not until around the age of 12 years old that children can differentiate effort from ability (Duda, 1987; Nicholls, 1978, 1989).

Countries are frequently classified as having a culture which emphasizes an individualistic or collectivistic perspective. Individualism is a view that centralizes the personal (e.g. personal goals, personal uniqueness and personal goals) while collectivism is a social way of being that is oriented towards in-groups (e.g., family, clan, religious groups; Triandis, 2001). The idea of contrasting countries based on individualism versus collectivism is based on the work of Geert Hofstede (Hofstede, 2001). For this meta-analysis, the identification of a country as collectivist or individualistic is consistent with the original research articles included in this meta-analysis. Individualism and collectivism are thought to have consequences for a variety of psychological states, such as self-concept, well-being, social relations, emotions, cognitions and motivation (Markus & Kitayama, 1991). For example, in individualistic cultures, the self is an independent construction where the goal is to become independent of others in order to discover and express one's unique attributes. In collectivist cultures, the self is an interdependent construction which is part of an encompassing social relationship. How the self is viewed has consequences for motivation, whether a youth athlete is motivated for achievement for its own sake or to meet the expectations of others (Markus & Kitayama, 1991)

Study 1 Methods

Selection of studies

The twelve relevant university databases were systematically searched for studies examining the relationships between goal orientations or motivational climate and perceived competence in sport (PsycARTICLES, PsycINFO, Academic OneFile, Child Development and Adolescent Studies, ERIC, PubMed, SAGE Journals Online, Scholars Portals Journals, SCOPUS, Social Sciences Full Text, Web of Science and Wiley Online Journals) from September 2017 until September 2018 (see Appendix A for coding manual) Unfortunately, the

university did not have access to SPORTDiscus, a bibliographic database for sports and sports medicine research, which could limit the articles included in the meta-analysis.

This search used variations on the following search terms: sport, youth, child, adolescent, young athletes, goal orientations, ego or task orientation, mastery or performance climate, and perceived competence. In the first stage of the review, English only articles were included or excluded based on their title or abstract. In the second stage of the review, full-text articles were excluded if they did not have a correlation table or statistical results which could be used to calculate the correlations.

Electronic versions of the Journal of Sport and Exercise Psychology, Journal of Sport Sciences, and other relevant journals were also searched for relevant articles. Reference lists of included articles and relevant reviews were searched for additional studies. Data were extracted from the articles that met the inclusion criteria. This data included correlations between goal orientations or perceived motivational climate and perceived competence, study year, participants' ages, and country (see Appendix A).

Analysis plan.

Fixed versus random-effects meta-Analysis. A fixed-effect model assumes that there is one actual effect size and that all studies are measuring the same effect. Fixed effects analysis assumes that all the studies share a common effect size (μ) and that the included observed studies are distributed around μ . Any effect size that differs must be due to sampling error. As in many other statistical procedures, this assumption of homogeneity can be tested.

A random-effects model assumes that the effect size is heterogeneous. Studies vary in their methodology, which means they are varying in their underlying effect size being sampled. Rather than assuming that there is one actual effect size (i.e., fixed effect), the random-effects

model assumes that there is a distribution of true effect sizes. The studies in a random-effects model are a random sample of that distribution. The summary effect size estimates the mean of the population of true effect sizes.

There are not any hard and fast rules as to which analysis technique to use. Fixed effects models have increased power to detect an effect. However, fixed effects models also have increased rates of Type I error when there is unexplained variance between studies. Random effects models have more accurate Type I error rates at the expense of statistical power compared to fixed-effects models. However, the major difference between the two statistical models is the generalizability of the results. The results of fixed effects models are conceptually limited to the particular set of studies included in the meta-analysis. For random-effects models, the effect size can be generalized to the population of effect sizes of which the current set of studies is a subset. The present meta-analysis used a random-effects model for the analysis.

Data analysis procedures. The software used for this meta-analysis were IBM SPSS version 25 (IBM Corp., 1989, 2017) and Comprehensive Meta-Analysis (CMA; version 3.3 070 Biostat, Inc., November 20, 2014). IBM SPSS was used to provide basic descriptive information. Potential moderators would only be analyzed if they were included in at least five of the articles included in the meta-analysis, to ensure sufficient power to detect an effect (Cooper, 2010).

CMA was used to estimate the mean effect size and 95% confidence intervals. Since the variables of interest for this meta-analysis are continuous variables, the correlation coefficient itself can serve as the effect size index. The variance of the correlation coefficient, r , is approximately

$$V_r = \frac{(1 - r^2)^2}{n - 1} \quad (1)$$

where n is the sample size. Before performing the synthesis, the correlation coefficient is transformed into Fisher's z , and all analyses are done using the transformed score:

$$z = 0.5 * \ln\left(\frac{1+r}{1-r}\right) \quad (2)$$

Variance of z

$$V_z = \frac{1}{n-3} \quad (3)$$

Standard error is

$$se_z = \sqrt{V_z} \quad (4)$$

Convert back

$$r = \frac{e^{2z} - 1}{e^{2z} + 1} \quad (5)$$

Publication bias. Since the publication of the first meta-analysis, there has been a concern that the published scientific literature documents only a portion of the results of all research conducted. The biggest concern is that the unpublished portion of the literature may be systematically different from the published portion. A meta-analysis based only on the published results may be biased. There have been many procedures developed to assess publication bias. In this meta-analysis, the visual inspection of the funnel plots along with Duval and Tweedie's (2000) Trim and Fill procedure will be used to correct the calculated effect size for publication bias.

Funnel plots. A funnel plot is considered an excellent exploratory tool for detecting possible publication bias (Cooper, 2010; Sterne et al., 2011; Sutton, 2009). A funnel plot is a

scatter plot which has the effect size on the x-axis and a measure of study size on the y-axis (i.e., standard error, sample size or variance). A funnel plot provides an excellent visual summary of the meta-analytic data set which should appear symmetric if bias is not present. Asymmetrical funnel plots can suggest there are potential gaps in the literature since the published studies were not dispersed equally on either side of the overall mean effect size. Symmetrical plots theoretically represent that the included studies are representative of all the relevant studies. However, visual interpretation of funnel plots can be challenging since factors other than bias can be the cause of asymmetry. Therefore, statistical tests such as Trim-and-Fill (Duval & Tweedie, 2000) are essential to consider when assessing publication bias (Cooper, 2010; Sutton, 2009).

Trim-and-Fill. Duval and Tweedie's (2000) Trim-and-Fill is a nonparametric method developed to estimate the number of missing studies in a meta-analysis and their effect on the average effect size. Trim-and-fill is a simple rank-based data augmentation procedure which formalizes the use of funnel plots. After adjusting for the missing effect sizes, the algorithm provides a point estimate and confidence intervals, which have been shown to be reliable in simulation studies.

This iterative process trims off the asymmetric outlying part of the funnel after estimating the number of studies in the asymmetric section. The algorithm then uses the symmetric remainder to estimate the exact center of the funnel and then replaces the trimmed studies and their missing counterparts around the center (see Duval & Tweedie (2000) for more specific details). The final estimate of the true mean and its variance are then based on the filled funnel plot. Trim-and-fill is considered a practical and powerful test to detect publication bias.

Meta-Analysis Results

This systematic search resulted in 929 articles. An additional 59 articles were found by searching references of selected articles, systematic reviews and meta-analysis. Articles were removed if they were duplicates, participants had special needs, were focused on physical education or physical activity, were literature reviews, systematic reviews or meta-analyses, were qualitative research, incorrect age groups (preschool children, emerging adults, adults or parents), other achievement areas (i.e., academics) or other research topics. The Prisma diagram (Moher et al., 2015) describes the workflow in detail (see Figure 1).

Sample summary. The general characteristics, author, year, country, mean age, sample size, sex makeup of the sample, sports category, and the correlates extracted, for the studies included in this meta-analysis are included in Table 1. A total of 30 articles, with 34 independent subgroups, from 1992 to 2018 are included in this meta-analysis. The studies came from 14 countries. North American countries (i.e., the US and Canada at 33.33%) and European countries (i.e., Spain, Germany and Italy at 30%) were the most represented regions. The mean age of the youth athletes ranged from 10.5 years to 16.90 years. The total sample size was 12,273. The sample sizes varied from 93 to 1962 youth athletes ($M = 360.97$) with a great deal of variability ($SD = 361.87$). Most studies focused on youth athletes from multiple sports (56.67%) while soccer (30%) was the most frequently studied single sport.

The results of this meta-analysis are presented in two parts. First, the relationships between goal orientations (i.e., task and ego) with perceived competence as well as potential moderators are reported. Next, the relationships between coaches' motivational climate (i.e., mastery and performance) with perceived competence as well as potential moderators are

reported. The moderators of interest are age and country (i.e., country where participants were recruited).

PRISMA WITH DETAILS

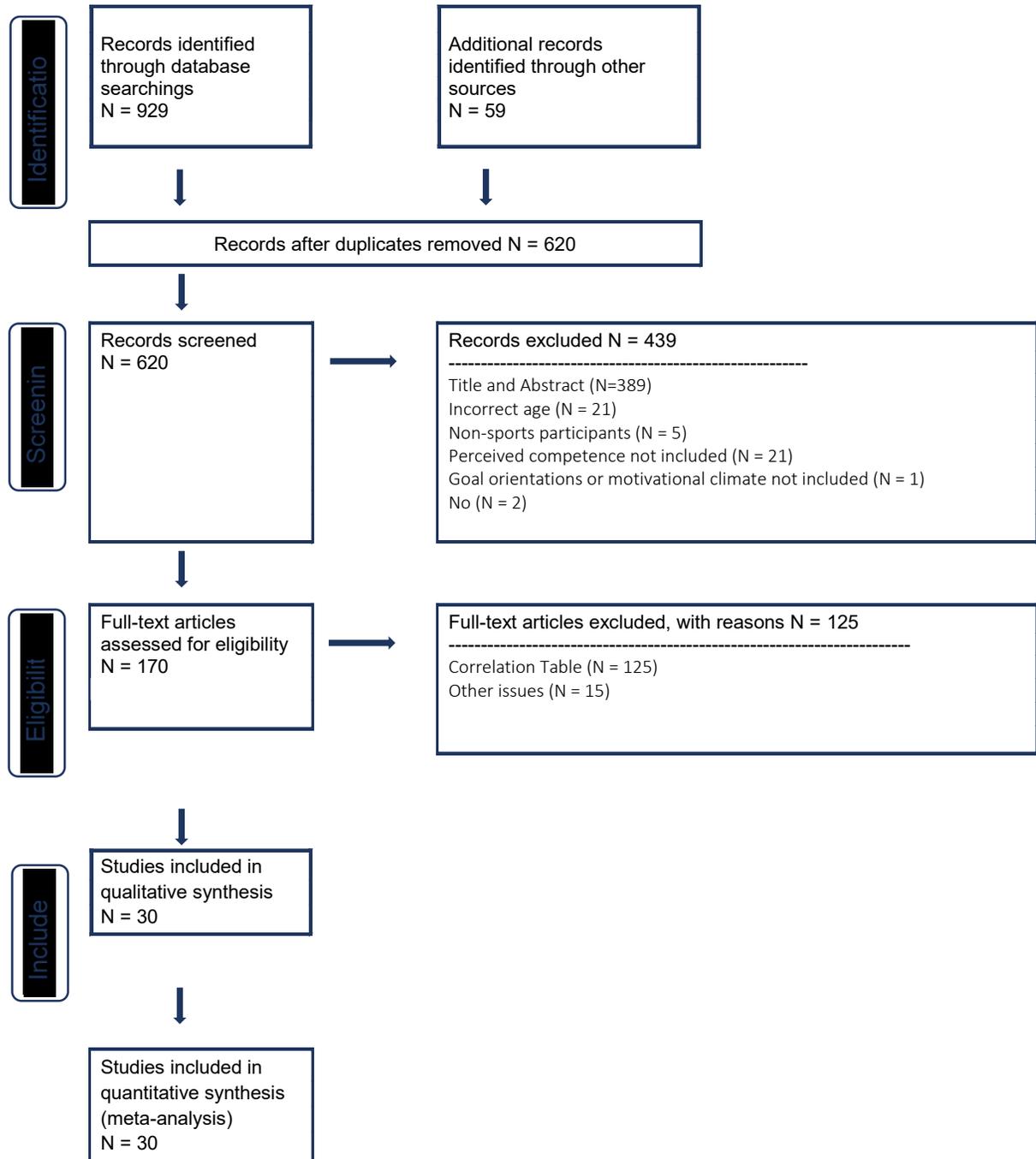


Figure 1. Prisma diagram of work flow for meta-analysis.

Table 1

Study characteristics and correlate categories extracted from each study.

Study	Year	Country	M_{age}	N	Sex	Sport	Data
Ahmadi et al.	2012	Iran	12.86	255	M	Mixed	MP
Al-Yaaribi & Kavussanu	2018	UK	14.48	358	M	Soccer	MP
Asghar et al.	2013	Germany	14.91	248	M	Soccer	TE
	2013	China	15.83	274	M	Soccer	TE
	2013	Pakistan	16.18	144	M	Field Hockey	TE
	2013	Germany	14.40	127	M	Field Hockey	TE
Bortoli et al.	2011	Italy	13.40	320	MG	Mixed	TE, MP
Bortoli et al.	2012	Italy	14.90	382	M	Soccer	TE,MP
Boyd & Yin	1996	USA	15.04	231	M	Mixed	TE
Castillo et al.	2009	Spain	13.54	967	MG	Mixed	TE

Cervello et al.	2007	Spain	13.70	167	MG	Tennis	TE, MP
Davies et al.	2016	Canada	NR	118	M	Ice Hockey	TE
	2016	Canada	NR	126	M	Ice Hockey	TE
Duda et al.	1992	Britain	10.5	142	MG	Mixed	TE
Eys et al.	2013	Canada	15.26	997	MG	Mixed	MP
Feichtinger & Honer	2014	Germany	11.9	828	M	Soccer	TE
Gutierrez et al.	2011	Spain	15.00	93	MG	Swimming	TE
Joesaar et al.	2011	Estonia	13.19	424	MG	Mixed	MP
Kim & Gill	1997	Korea	13.94	334	MG	Mixed	TE
Kipp & Weiss	2013	USA	13.00	303	F	Mixed	MP
Lau et al.	2007	China	16.90	188	MG	Mixed	TE
	2007	USA	16.90	177	MG	Mixed	TE
Li & Chi	2007	China	16.20	171	M	Handball	TE

Liukkonen	1998	Finland	14.00	557	M	Soccer	TE, MP
Livesey	2009	Britain	NR	273	M	Mixed	TE
Ommundsen & Pedersen	1999	Norway	13.80	136	MG	Mixed	TE
Rottensteiner et al.	2015	Finland	15.09	1962	MG	Mixed	TE
Sari	2015	Turkey	13.13	403	MG	Mixed	TE
Smith et al.	2006	Spain	10.90	223	M	Soccer	TE, MP
Stephens	1998	USA	11.47	212	F	Soccer	TE
Stuntz & Weiss	2009	USA	12.57	303	MG	Mixed	TE
Vazou et al.	2006	England	14.08	493	MG	Mixed	MP
Voight et al.	2000	USA	15.72	196	F	Volleyball	TE
Weiss et al.	2009	USA	16.00	141	F	Soccer	MP

Note. USA=United States of America; UK=United Kingdom; NR=not reported; M=male; F=female; MG=mixed gender; T=Task Orientation; E=Ego Orientation; M=Mastery Climate; P=Performance Climate.

Goal orientations.

Magnitude of the relationships. Table 2 provides a summary of the meta-analysis results of the associations between both goal orientations, task and ego, with perceived competence. There was significant heterogeneity in the magnitude of the correlations between both task and ego orientation with perceived competence (see Table 2). The results for the random-effects meta-analysis of the relationship between task orientation and perceived competence along with potential moderators are presented first followed by the results for the relationships between ego orientation and perceived competence.

Table 2

Summary of meta-analytic results of associations of perceived competence with goal orientations.

	Goal Orientation	
	Task	Ego
Heterogeneity (Q; df=25)	60.24***	147.59***
Random-effects Mean (ES)	0.24***	0.20***
95% CI	0.21:0.28	0.15:0.25

Note: *p<0.05; **p<0.001; ***p<0.001

Task orientation. Task orientation, where the focus is on improving skills and learning new things, was expected to be positively related to perceived competence. Overall, the average correlation between task orientation and perceived competence was 0.24, which is a positive small to medium effect size, according to Cohen (1992). Figure 2 lists the studies used in this random effect meta-analysis along with the distribution of their effect sizes around the summary effect size, $r = 0.24$. Heterogeneity in the effect sizes can be seen by the lack of overlap of the

confidence intervals for the different studies. Twenty-three of the twenty-six studies found a significant positive correlation between task orientation and perceived competence. Effect sizes ranged from (an absolute value of) 0.007, a small effect, to a moderate to a large effect size of 0.40.

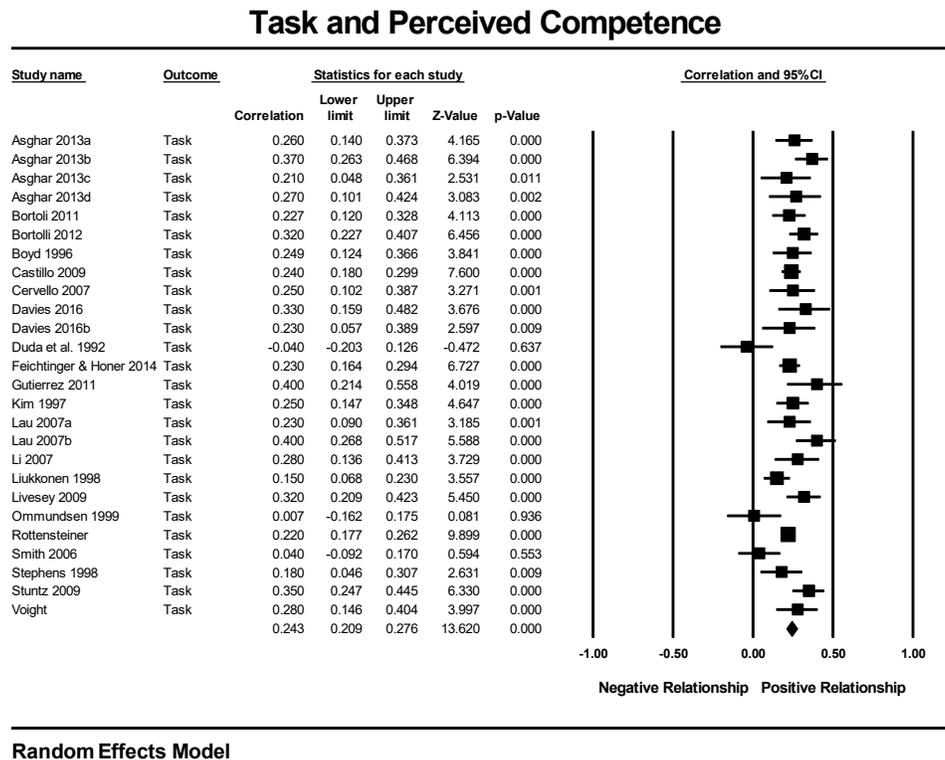


Figure 2 Relationship between task and perceived competence.

Publication bias. Visual inspection of the funnel plot for the correlations between task orientation and perceived competence (see Figure 3) suggests that the effect sizes are not

distributed symmetrically around the average effect size of 0.24. There appear to be more studies with effect sizes that are larger than the average effect size.

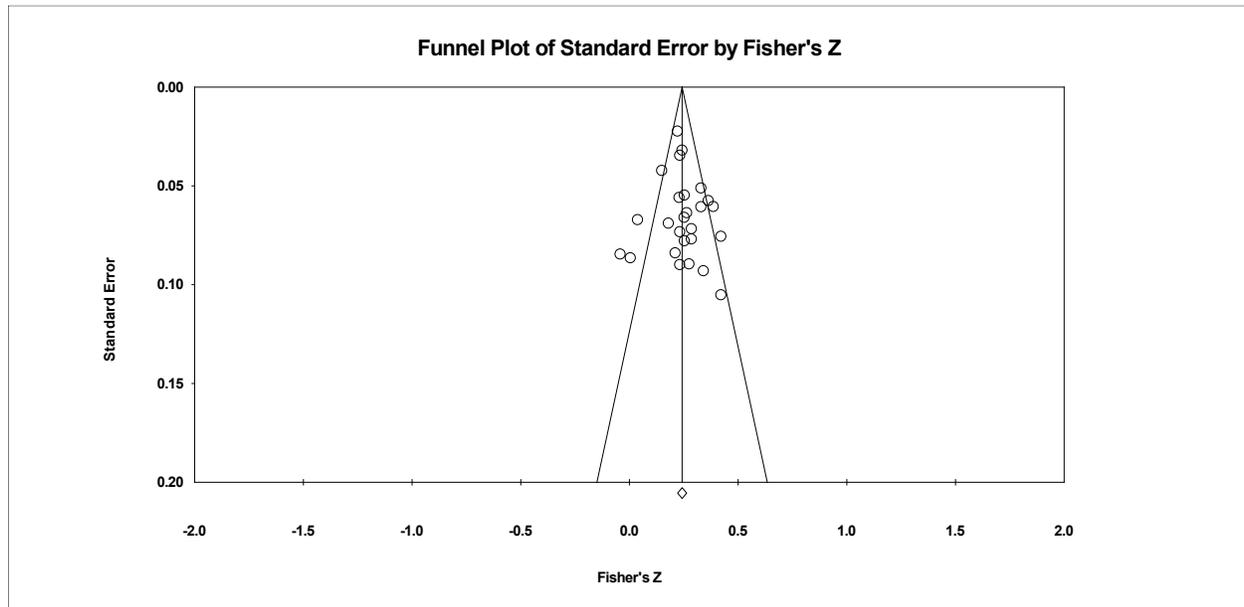


Figure 3. Funnel plot for observed effect sizes for the relationship between perceived competence and task orientation.

In combination with a visual inspection of the funnel plot, Sterne et al. (2011) recommend that statistical tests for funnel plot asymmetry be considered. For this meta-analysis, Duval and Tweedie's (2000) trim-and-fill technique was used to test for such asymmetry (Cooper, 2010; Sutton, 2009). Based upon the results of this analysis (see Table 3), six imputed effect sizes, shown with black fill, were added to the left side of the funnel plot (see Figure 4). The addition of these six studies resulted in a reduction of the average effect size of the relationship between perceived competence and task orientation from 0.24 to 0.21.

Table 3

Results of Duval and Tweedie's trim and fill for the random-effects model of the relationship between task orientation and perceived competence.

	Studies Trimmed	Point Estimate	LL	UL	Q-Value
Observed Values		0.24	0.21	0.28	60.24
Adjusted Values	6	0.21	0.18	0.25	97.40

Note: LL = lower limit; UL = upper limit

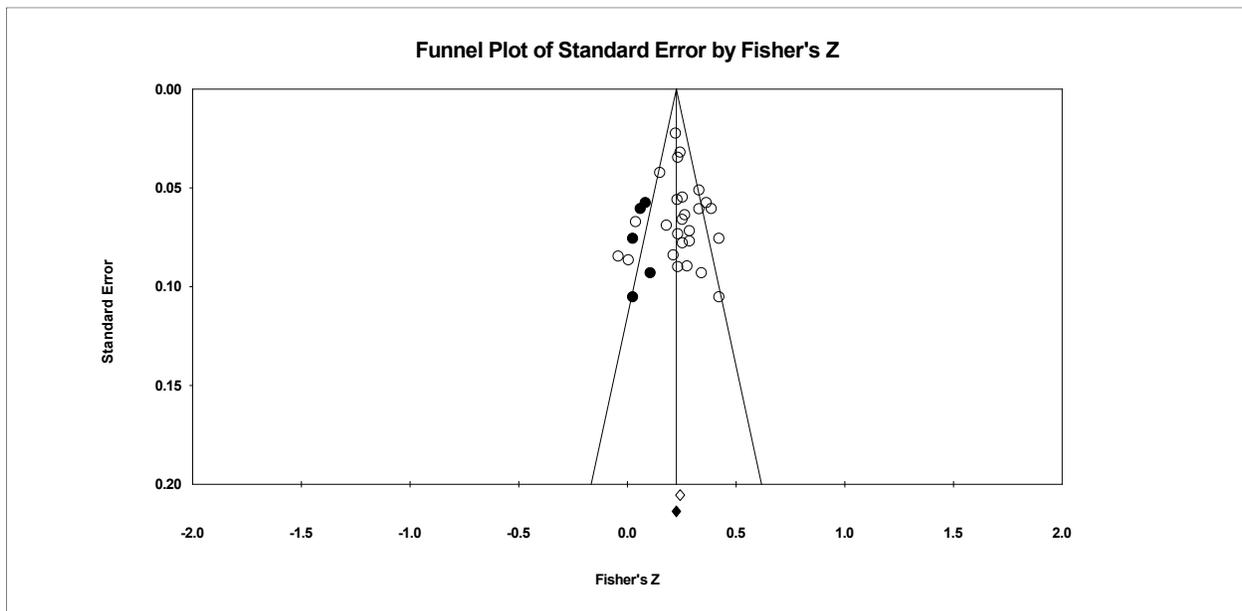


Figure 4. Funnel plot with six imputed effect sizes for the relationship between perceived competence and task orientation.

Ego orientation. The expected relationship between ego orientation, where the focus is on maximizing favorable evaluations, and perceived competence was not as clear as with task

orientation. In some research studies ego orientation is positively related to perceived competence (Lau, Cheung, & Ransdell, 2007), while in other studies it is negatively correlated (Voight, Callaghan, & Ryska, 2000) and finally, in some studies, there is no relationship (Feichtinger & Höner, 2014). While the results are mixed, the consensus appears to be that ego orientation is negatively related to perceived competence. In this meta-analysis, the overall average correlation between ego orientation and perceived competence was 0.20, which is a positive small effect size, according to Cohen (1992). Figure 5 lists the studies used in this random effect meta-analysis along with the distribution of their effect sizes around the summary effect size, $r = 0.20$.

As with the relationship between task orientation and perceived competence, heterogeneity of the effect sizes can be seen by the lack of overlap of the confidence intervals (see Figure 5). Nineteen of the twenty-six studies found a significant positive correlation between ego orientation and perceived competence ranging from (absolute value of) 0.07, a small effect, to a large effect size of 0.58.

Ego and Perceived Competence

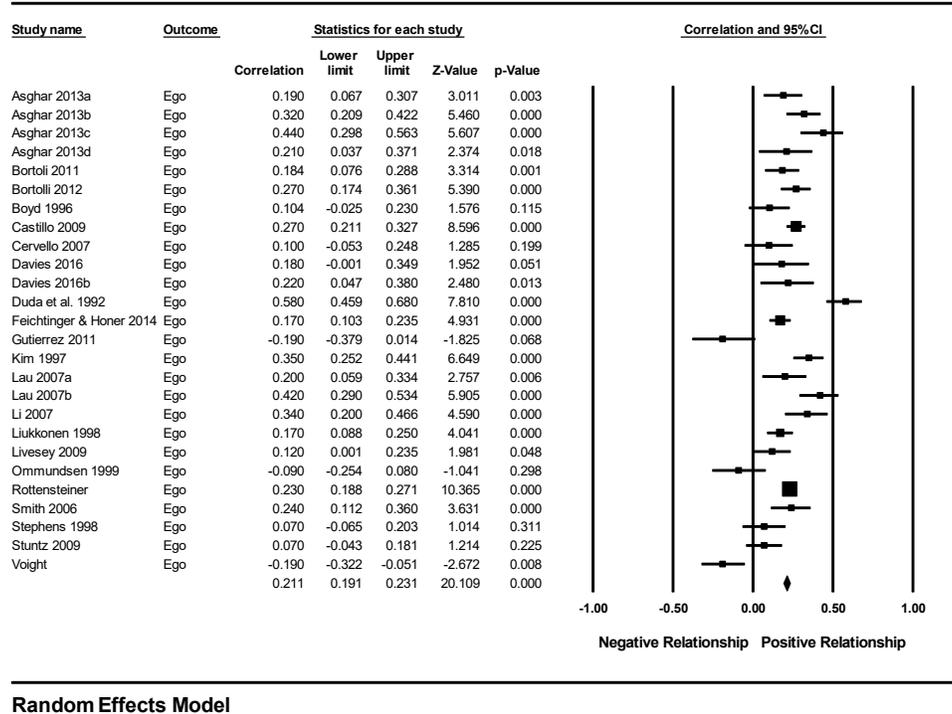


Figure 5. Relationship between ego and perceived competence.

Publication bias. Visual inspection of the funnel plot for the correlations between ego orientation and perceived competence (see Figure 6) suggests that the effect sizes are distributed symmetrically around the average effect size of 0.20. In contrast to task orientation, for ego orientation, there appear to be more studies which are smaller than the average effect size. The distribution of effects sizes towards the top of the funnel plot reflects the fact that studies with small sample sizes are missing from this meta-analysis.

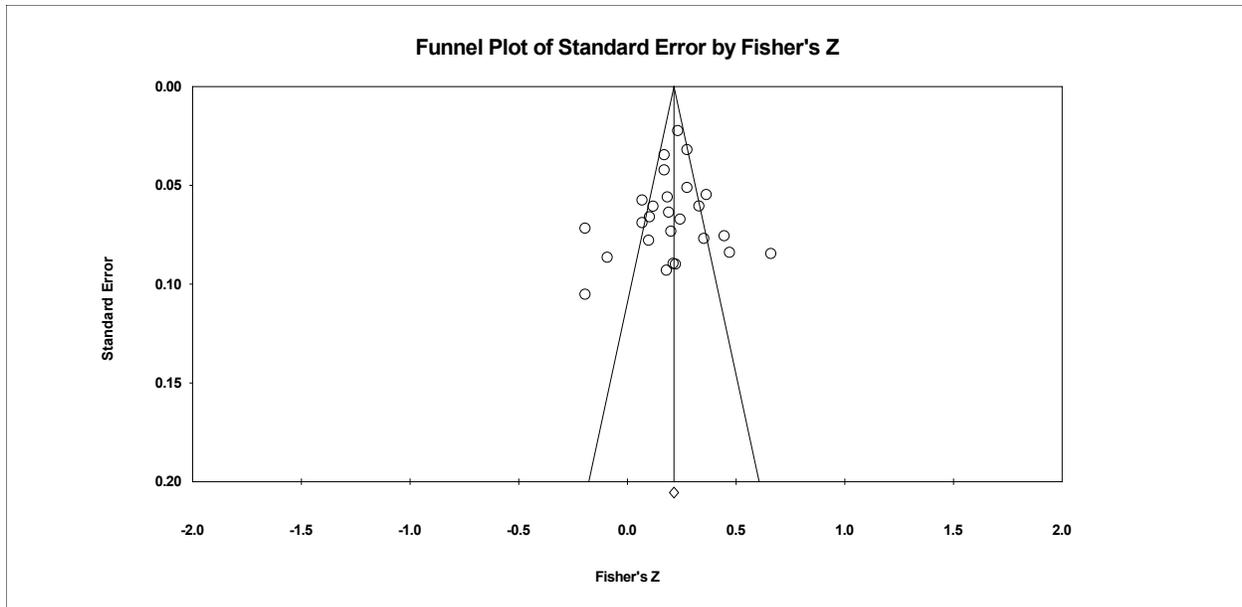


Figure 6. Funnel plot for observed effect sizes for the relationship between perceived competence and ego orientation.

Duval and Tweedie's (2000) trim-and-fill technique was used to test for asymmetry for the effect sizes of the relationship between perceived competence and ego orientation (Cooper, 2010; Sutton, 2009). Based on the results of this analysis (see Table 4), no additional studies needed to be imputed for this meta-analysis (see Figure 7). Therefore, the effect size did not need to be adjusted, and the sample of included studies is theoretically representative even if studies were missed during the search process (see Table 4).

Table 4

Results of Duval and Tweedie's trim-and-fill for the random-effects model of the relationship between ego orientation and perceived competence.

	Studies Trimmed	Point Estimate	LL	UL	Q-Value
Observed Values		0.20	0.15	0.25	147.59
Adjusted Values	0	0.20	0.15	0.25	147.59

Note: LL = lower limit; UL = upper limit

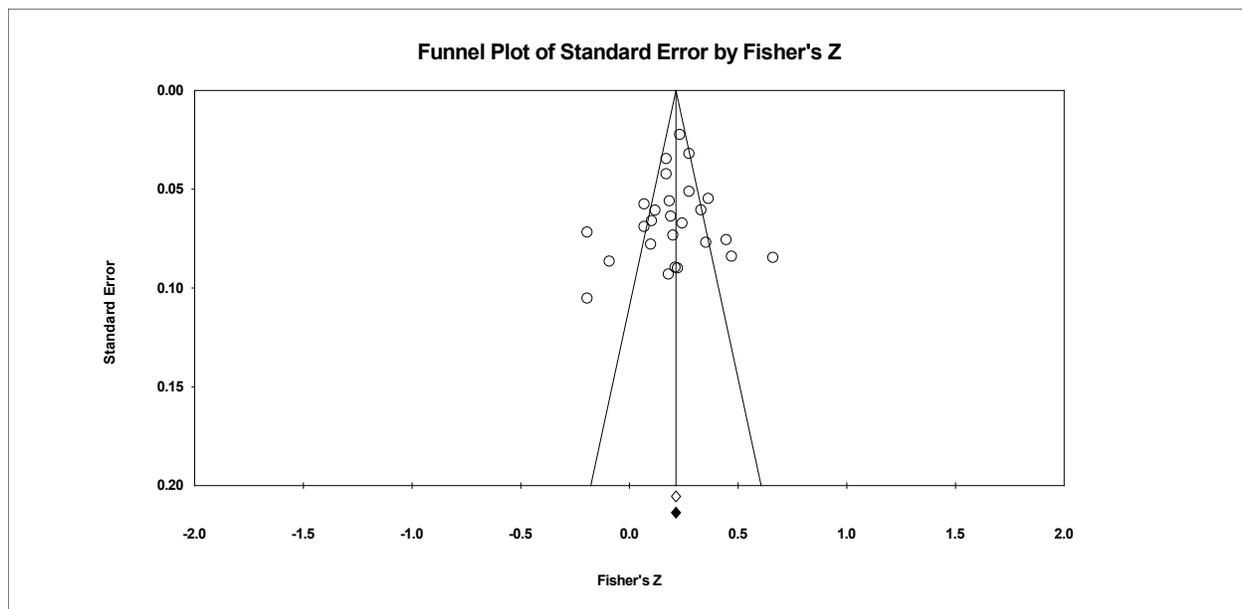


Figure 7. Funnel plot for imputed effect sizes for the relationship between perceived competence and ego orientation.

Moderators. Given the heterogeneity of the effect sizes across these studies, country (i.e., country where participants were recruited) and age (i.e., mean age of study participants) were examined as potential moderators of the associations between goal orientation and perceived competence.

Country. Country, whether collectivist or individualistic, was a significant moderator of the association between goal orientation and perceived competence (see Table 5).

Table 5

Summary of meta-analytic results of country as a moderator of associations of perceived competence with goal orientations.

	Goal Orientations	
	Task	Ego
Country ($Q_{b(1)}$)	1.30	12.414***
Collectivist (k=5)	0.28***	0.33***
Individualistic (K=21)	0.24***	0.17***

Note: * $p < 0.05$; ** $p < 0.001$; *** $p < 0.001$; k = number of included studies.

Task orientation. Country was not a moderator of the relationship between task and perceived competence as can be seen in the lack of significant heterogeneity in effect sizes (see Table 5). This finding suggests that the relationship between task orientation and perceived competence is similar for individualistic and collectivist countries.

Ego orientation. Country was a significant moderator of the relationship between ego and perceived competence as can be seen with significant heterogeneity in effect sizes (see Table 6). The significant heterogeneity suggests that the relationship between perceived competence and ego orientation varies across collectivist and individualistic countries. The relationship between ego orientation and perceived competence for collectivist countries was almost twice as strong as

for individualistic countries, 0.33 compared to 0.17, respectively. Figure 8 lists the studies used in this random-effects meta-analysis along with the distribution of their effect sizes around the summary effect size. All the effects sizes for the relationship for collectivist countries between ego orientation and perceived competence, ranging from small to moderate-to-large in size, were significantly different from zero. As can be seen in Figure 8, there was much variability in this relationship for individualistic countries, including six of the studies finding no significant relationship, with effect sizes ranging from -0.19 to 0.58.

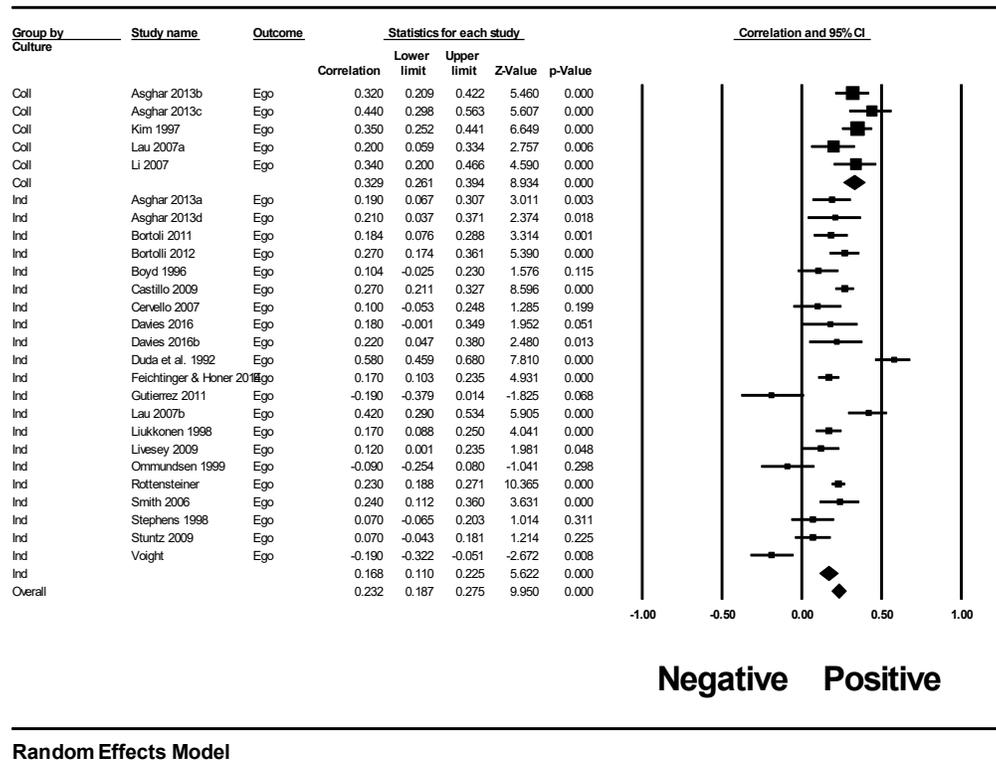


Figure 8. Relationship between ego orientation and perceived competence based on country (collectivist or individualistic).

Age. Meta-regression analysis was used to test if the mean age of study participants significantly predicted the relationship between goal orientations, task or ego, and perceived competence. The results of the meta-analysis indicated that for task orientation mean age explained 27% of the between-study variance ($R^2_{analog} = .27$, $Q(1) = 10.52$, $p=0.0012$). As the mean age of the study, participants increase the relationship, or correlation, between task orientation and perceived competence also increases ($b = 0.0343$, $se = 0.016$, $[0.0136, 0.0550]$, $p=.0012$; see Figure 9). The mean age of the study participants was not a significant predictor for the relationship between ego orientation and perceived competence ($Q(1) = 0.01$, $p=.9154$, $b = -0.0019$, $se = 0.017$, $[-0.0366, 0.0328]$, $p = .9154$).

Summary goal orientations. In summary, both task and ego orientation were significantly positively correlated with perceived competence. Country, collectivist or individualistic, was a significant moderator of the relationship between ego orientation and perceived competence. Youth athletes from collectivist countries have a stronger relationship between ego orientation and perceived competence. Age was also a significant moderator for the relationship between task orientation and perceived competence only. Studies with older youth athletes reported a stronger correlation between task orientation and perceived competence compared to studies with younger youth athletes.

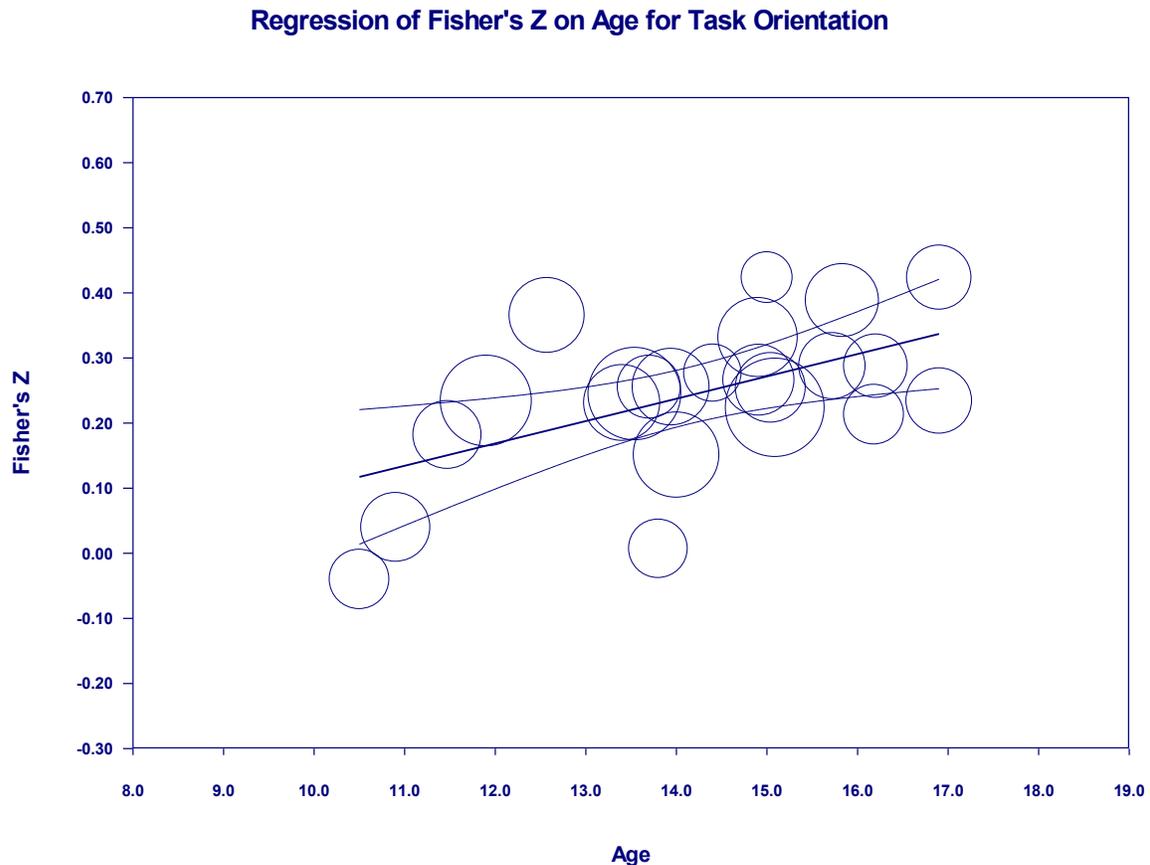


Figure 9. Relationship between task and perceived competence by age.

Motivational climate.

Magnitude of the relationships. Table 6 provides a summary of the meta-analysis results of the associations between both motivational climates, mastery and performance, with perceived competence. There was significant heterogeneity in the magnitude of the correlations between both mastery and performance climates with perceived competence (see Table 6). The results for the random-effects meta-analysis of the relationship between mastery climate and perceived competence along with potential moderators are presented first followed by the results for the relationships between performance climate and perceived competence.

Table 6

Summary of meta-analytic results of associations of perceived competence with motivational climate.

	Motivational Climate	
	Mastery	Performance
Heterogeneity (Q; df=11)	80.49***	63.70***
Random-effects Mean (ES)	0.19***	-0.078*
95% CI	0.12:0.27	-0.15: -0.006

Note: * $p < 0.05$; ** $p < 0.001$; *** $p < 0.001$; k = number of included studies.

Mastery climate. It was expected that higher levels of mastery climate, where the coach emphasizes personal effort, or improvement, and working with others to develop skills, would be associated with higher perceived competence. Overall, the average correlation between mastery climate and perceived competence was 0.19 (see Table 7), which is a positive small effect size, according to Cohen (2012). Figure 10 lists the studies used in this random-effects meta-analysis along with the distribution of their effect sizes around the summary effect size, $r = 0.19$. Heterogeneity of the effect sizes can be seen by the lack of overlap in the confidence intervals for the different studies. Nine of the twelve studies found a significant positive correlation between task orientation and perceived competence. Effect sizes ranged from a small effect size with (absolute value of) 0.02 to a moderate to a large effect size of 0.42.

Mastery Climate and Perceived Competence

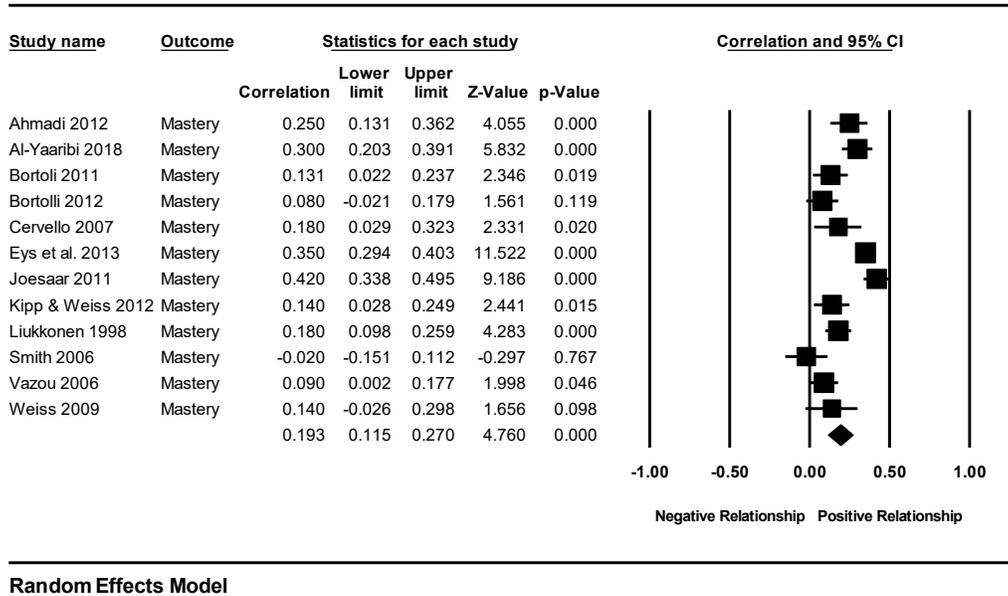


Figure 10. Relationship between mastery climate and perceived competence.

Publication bias. Visual inspection of the funnel plot for the correlations between mastery climate and perceived competence (see Figure 11) suggests that the effect sizes are not distributed symmetrically around the average effect size of 0.19.

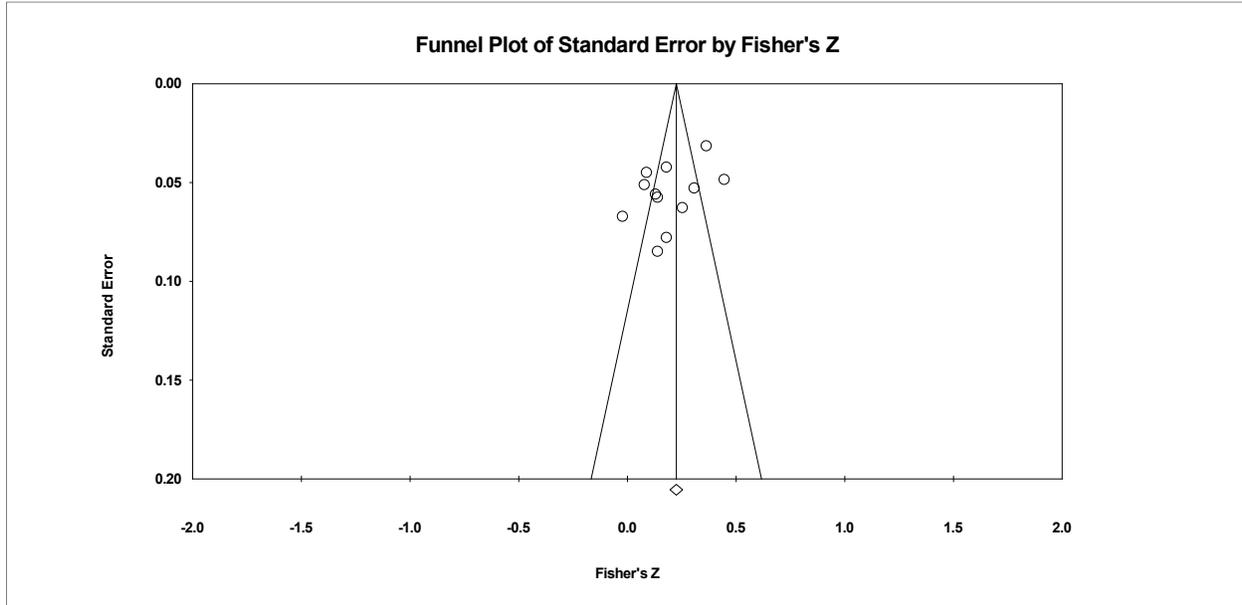


Figure 11. Funnel plot for observed effect sizes for the relationship between mastery climate and perceived competence.

Duval and Tweedie's (2000) trim-and-fill technique was used to test for such asymmetry (Cooper, 2010; Sutton, 2009). Based upon the results of this analysis (see Table 7), one imputed effect size was added to the right side of the funnel plot (see figure 12). The addition of this study resulted in an increase in the average effect size of the relationship between perceived competence and mastery orientation from 0.19 to 0.21.

Table 7

Results of Duval and Tweedie's trim-and-fill for the random-effects model of the relationship between mastery climate and perceived competence.

	Studies Trimmed	Point Estimate	LL	UL	Q-Value
Observed Values		0.19	0.11	0.27	80.49
Adjusted Values	1	0.21	0.13	0.23	91.08

Note: LL = lower limit; UL = upper limit

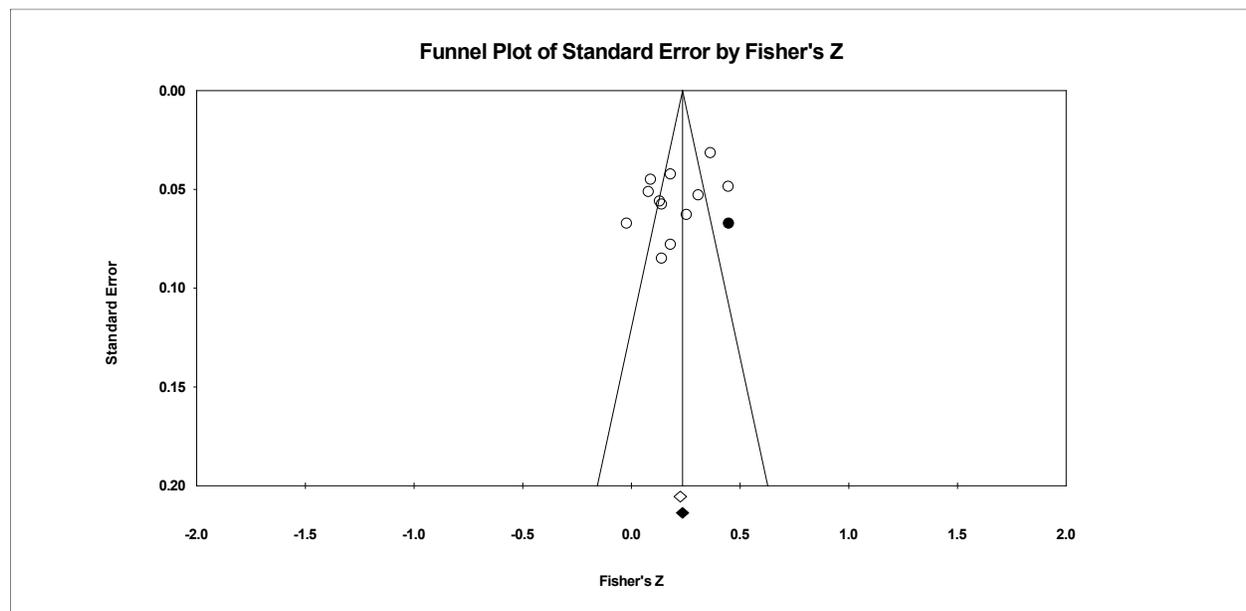


Figure 12. Funnel plot for imputed effect sizes for the relationship between mastery climate and perceived competence.

Performance climate. Performance climate, where the coach emphasizes social comparisons and winning while giving the most attention to the best players, was expected to be negatively related to perceived competence. Performance climate was negatively related to perceived competence with an average correlation of $r = -0.078$ (see Table 7). Heterogeneity of

the effect sizes can be seen, in Figure 13, by the lack of overlap in the confidence intervals of the different studies. Only four of the twelve studies found a significant relationship between performance climate and perceived competence. Effect sizes for all the studies ranged from (an absolute value of) 0.010, a small effect size, to -0.300 a moderate effect size.

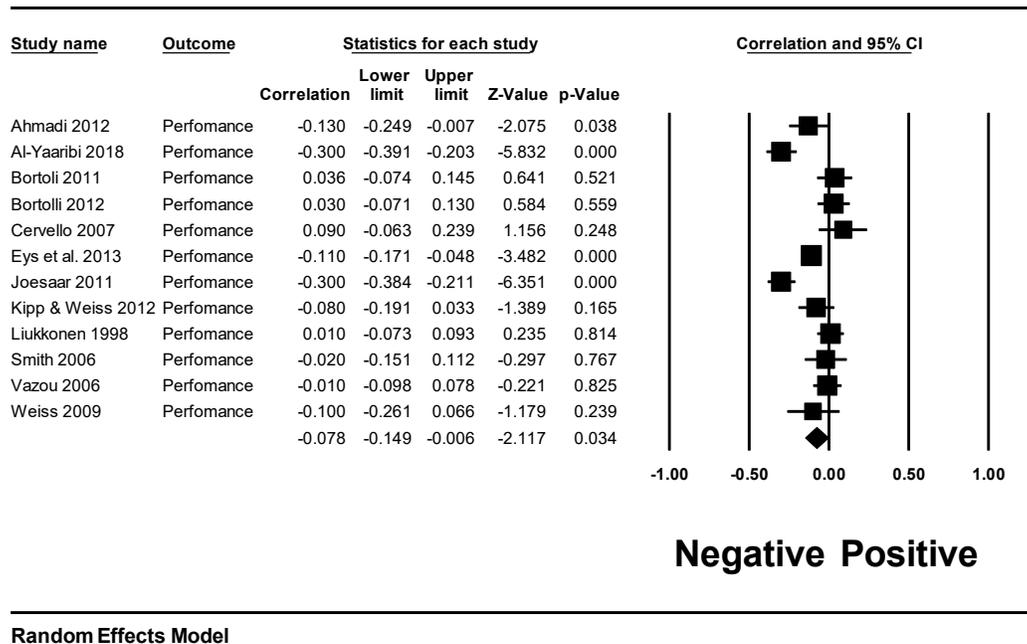


Figure 13. Relationship between performance climate and perceived competence.

Publication bias. Visual inspection of the funnel plot suggests that the studies are not normally distributed around the mean effect size (see Figure 14). There appear to be more studies suggesting a positive relationship between performance climate and perceived competence.

Additionally, two studies found a negative relationship between performance climate and perceived competence, which are further from the mean than any of the other studies.

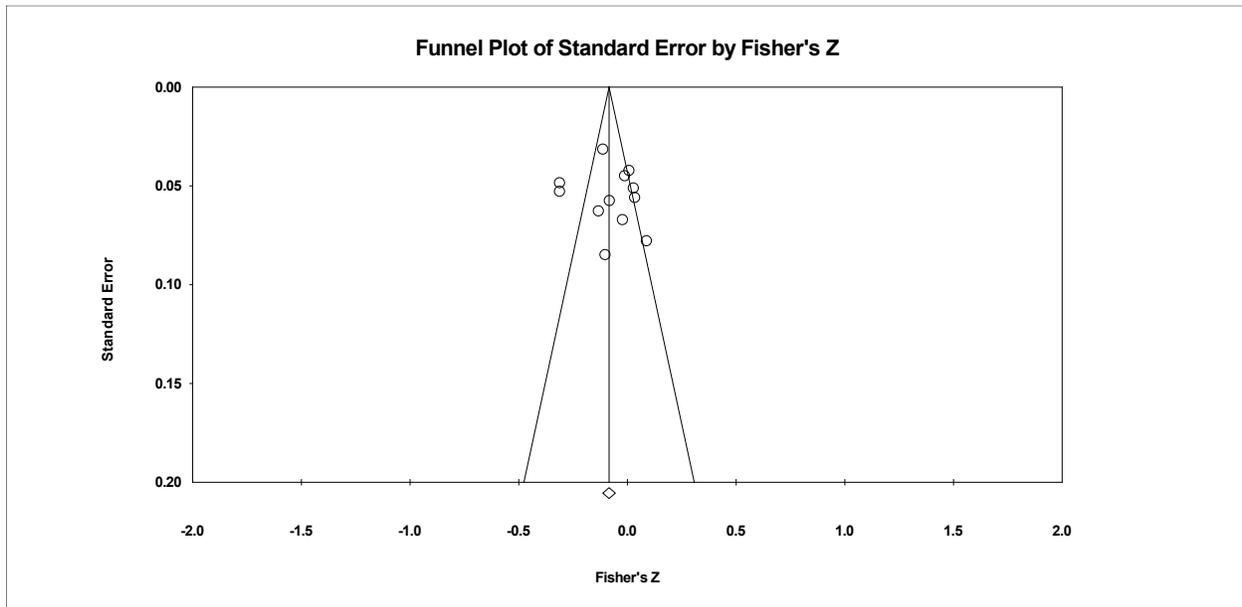


Figure 14. Funnel plot for observed effect sizes for the relationship between performance climate and perceived competence.

Duval and Tweedie's (2000) trim-and-fill technique resulted in one study with a negative effect size being added (see Table 8; Cooper, 2010; Sutton, 2009). This imputed study (see Figure 15) resulted in a slightly stronger negative effect size between performance climate and perceived competence, from -0.078 to -0.093, which is still a small effect size.

Table 8

Results of Duval and Tweedie's trim-and-fill for the random-effects model of the relationship between performance climate and perceived competence.

	Studies Trimmed	Point Estimate	LL	UL	Q-Value
Observed Values		-0.078	-0.15	-0.006	63.70
Adjusted Values	1	-0.093	-0.16	-0.020	69.24

Note: LL = lower limit; UL = upper limit

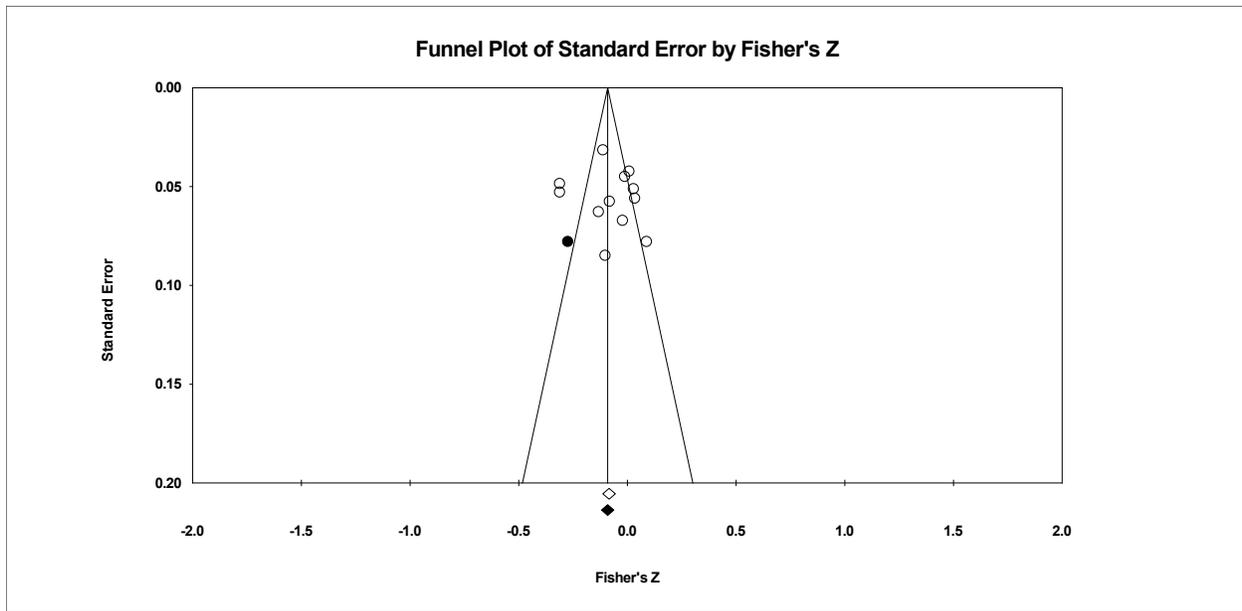


Figure 15. Funnel plot for imputed effect sizes for the relationship between performance climate and perceived competence.

Moderators. Country (i.e., country where participants were recruited) and age, were examined as potential moderators of the associations between goal orientation and perceived competence given the heterogeneity of the effect sizes across these studies,

Country. Country was not a significant moderator for the relationship between either mastery climate or performance climate and perceived competence (see Table 10). This finding suggests that the relationship between motivational climate and perceived competence is similar across individualistic and collectivist countries.

Table 9

Summary of meta-analytic results of country as a moderator of associations of motivational climate with perceived competence.

	Motivational Climate	
	Mastery	Performance
Country ($Q_{b(1)}$)	0.711	0.603
Collectivist (k=1)	0.250***	-0.130***
Individualistic (k=11)	0.188***	-0.073***

Note: * $p < 0.05$; ** $p < 0.001$; *** $p < 0.001$; k = number of included studies.

Age. Meta-regression analysis was also used to test if age significantly predicted the relationship between motivational climate, mastery or performance, and perceived competence. The results of the meta-analysis indicated for both mastery climate ($Q(1) = 0.79$, $b = 0.0294$, $se = 0.0330$, $[-0.0353, 0.0941]$, $p = .3792$) and performance climate ($Q(1) = 0.04$, $b = -0.0062$, $se = 0.0315$, $[-0.0680, 0.0550]$, $p = .8437$), age was not a significant predictor of this relationship.

Summary. As expected, task orientation and perceived mastery climate were positively associated with perceived competence. Interestingly, ego orientation was also positively associated with perceived competence while perceived performance climate was negatively associated with perceived competence. The moderators did not always explain the heterogeneity of effect sizes in the relationships for goal orientations or motivational climate with perceived competence. The mean age of study participants was a significant moderator only for the relationship between task orientation and perceived competence. Additionally, the relationship between ego orientation and perceived competence was moderated by the country from which youth athletes were recruited.

Discussion

The aim of this meta-analysis was to examine the magnitude of the relationships of goal orientations and perceived motivational climate with perceived competence. Additionally, the impact of potential moderators of these relationships was investigated (i.e., country and age). It was expected that higher task orientation (i.e., where success is defined based on self-improvement in their skills and through effort; (Duda & Nicholls, 1992; Nicholls, 1989)) would be associated with higher perceived competence. However, it was not clear based on the research literature as to the relationship between ego orientation (i.e., where success is defined with references to the performance of others) and perceived competence (Duda & Nicholls, 1992; Nicholls, 1989). While some studies have reported a negative relationship between ego orientation and perceived competence, this relationship was not consistently reported. For motivational climate, high perceived mastery climate (i.e., where the emphasis is on learning, improvement and effort) was expected to be associated with high perceived competence while

high perceived performance climate (i.e., where the emphasis is on competition, winning and outperforming others) was expected to be associated with low perceived competence.

The choice of potential moderators when conducting a meta-analysis is limited to the moderating characteristics that were consistently provided by the authors of the included studies. In this meta-analysis, since there was a developmental focus in this research, the study characteristics of interest were the mean age of youth athletes and the country where the youth athletes were recruited.

Goal orientations and perceived competence. Both task orientation and ego orientation were significantly and positively related to perceived competence in this meta-analysis. According to AGT (Duda, 1987; Nicholls, 1989), youth athletes would attempt to demonstrate competence in an achievement setting and then use task or ego-oriented criteria to evaluate their success. Both task and ego orientation had significant heterogeneity in the size of their effect, which supported using the moderators post-hoc to understand the factors which might contribute to this variability.

Task orientation. For youth athletes who are high in task orientation, their demonstration of ability is judged from a self-referenced perspective. In this situation, success, or feeling competent, is experienced through personal improvement at the task, learning something new or challenging, or exerting high levels of effort. As expected, task orientation was positively associated with perceived competence. Only three of the studies included in this meta-analysis did not find a significant relationship between task orientation and perceived competence (Duda et al., 1992; Ommundsen & Pedersen, 1999; A. L. Smith, Ullrich-French, et al., 2006). The effect size found for the relationship between task orientation, and perceived competence was as

expected and was similar, but slightly smaller, to the effect size found in Lochbaum et al., (2018) meta-analysis.

Ego orientation. Ego orientation was positively associated with perceived competence, which was not expected based on the literature review for this research study. Cervelló, Escartí, and Guzmán (2007) found that youth athletes with high ego orientation and low perceived competence were more likely to drop out of sports. An athlete who has a strong desire to win but who does not feel very competent or able to win, not surprisingly, will likely not continue in that activity. Rottensteiner et al. (2015), however, found that high ego orientation was predictive of high perceived competence and sports continuance. This can possibly be explained by other research studies that have looked at motivational profiles for goal orientations, reporting that high task orientation could buffer the potentially negative effects of a high ego orientation. While youth athletes with low task orientation and high ego orientation have lower perceived competence, youth athletes with moderate task orientation and high ego orientation have higher perceived competence (Boixadós, Cruz, Torregrosa, & Valiente, 2004; A. L. Smith, Balaguer, et al., 2006). That is, athletes who are strongly focused on performance indicators, but who are also committed to personal skill development and improvement, are going to feel more positively about themselves. This would be particularly true in the case of elite athletes, who possess both a strong competitive drive, as well as an exceptional level of skill development.

It appears that the relationship between ego orientation and perceived competence is not frequently looked at in isolation, as a zero-order correlation, but rather in combination with other motivational or psychological variables. Clearly the effects of having a higher ego orientation are different, depending on the individual's level of task orientation.

In the case of a meta-analysis, researchers are solely looking at the zero-order correlations between ego orientation and perceived competence. The effect size for the relationship between ego orientation and perceived competence, $r = .21$, found in this meta-analysis is identical to the effect size found for this relationship in Lochbaum et al. (2018) meta-analysis. However, these results do not necessarily represent the complex relationship between ego orientation and perceived competence.

Country. While there were no specific hypotheses offered with respect to country (i.e. individualistic versus collectivism), research does suggest that youth athletes in collectivist countries report higher levels of ego orientation and lower levels of task orientation compared to youth athletes in individualistic countries (Alfermann, Geisler, & Okade, 2013; Asghar, Wang, Linde, & Alfermann, 2013; Sari, Ilic, & Ljubojevic, 2013). Country was only a significant moderator of the relationship between ego orientation and perceived competence in this meta-analysis. Youth athletes in collectivist countries reported positive relationships between ego orientation and perceived competence that were almost twice the size of this relationship in individualistic countries.

Achievement motivation is thought to be a fundamental human characteristic. Youth athletes from different countries have different constructs for the self, others and their interdependence. In individualistic countries, the self is independent, while in collectivist countries, the self is interdependent (Maehr, 2008). These constructs of the self can influence many aspects of the individual such as cognition, emotion and motivation. Members of collectivist cultures seek connectedness, social integration, and interpersonal harmony, which contributes to simulance. Simulance is the need to imitate or emulate others. In a collectivist

culture, then, the motive to achieve does not lie solely in the individual personally but could be an other-motivated, socially-oriented achievement.

Socially oriented achievement motivation has the goal of meeting the expectations of significant others, which could mean getting admitted to a prestigious university or winning a sports tournament. In this case, having an ego orientation might imply a desire to win ‘for the team’, as opposed to a focus on individual achievement. In contrast, individually oriented achievement motivation (more common in an individualist culture) implies striving for achievement for its own sake. An ego orientation in this environment would have more negative implications, with a focus solely on one’s own performance. The study of achievement motivation originated in North America, a highly individualized culture, along with the development of questionnaires used to measure these constructs.

From this perspective, task orientation is self-referenced, while ego orientation is other-referenced. It is possible that when youth athletes from collectivist countries report higher levels of ego orientation, what is being measured is really a socially-oriented motivation. If this is the case, high levels of ego orientation would not be negatively associated as expected with many psychological outcomes (Alfermann et al., 2013; Sari et al., 2013).

Age. Age was only a significant moderator of the relationship between task orientation and perceived competence. Age explained 27% of the variance in effect sizes across the studies. As the mean age of study participants increased, the relationship between task orientation and perceived competence became slightly stronger. This finding could be because task orientation is expected to decrease as a function of age, along with perceived competence (Nicholls, 1984, 1989). Task orientation and perceived competence are both expected to decrease as youth athletes become better able to differentiate effort from ability, around the age of 12. Before 12

years of age, youth athletes define success in terms of high effort or ability since they do not understand that needing to put in much effort could mean low ability. As youth get older, they may associate being more task-oriented (i.e., working on skill development) with being less physically competent in the athletic domain.

While the rate of change for this slope in this meta-analysis might seem small, there does not appear to be any other meta-analysis that investigated age as a moderator for dichotomous goal orientations. This finding supports the slightly larger effect size, $r = .26$, for the relationship between task orientation and perceived competence found in the Lochbaum, et al., (2018) meta-analysis compared to the effect size, $r = .21$, found for this relationship in the current meta-analysis. Lochbaum and colleagues (2018) included studies with adult participants competing at the Masters level, while the current meta-analysis was limited to youth athletes. This finding also supports both Nicholls (1989) and Harter's (2012) theories that there is a developmental component for self-perceptions, which should be considered when designing research studies, including youth athletes.

Motivational climate and perceived competence. Mastery and performance climate were both significantly related to perceived competence. As expected, mastery climate was positively related to perceived competence while performance climate was negatively related to perceived competence. None of the moderators of interest (i.e., country and age) were significant moderators of the effect sizes. There were only 15 studies in this meta-analysis that met the criteria for inclusion, which results in low power to detect any moderator effects.

There was only one study from a collectivist country for motivational climate that met the inclusion requirements for this meta-analysis. Research looking at other psychological variables have found that youth athletes in collectivist countries perceive higher levels of performance

climates compared to those in individualistic countries (Alfermann et al., 2013; Morgan, Sproule, Mcneill, Kingston, & Wang, 2006). Youth athletes in collectivist countries also report higher levels of ego orientation, which could influence the perception of their motivational climate. Vazou (2010) found that youth athletes who were high in ego orientation were more likely to perceive their motivational climate as performance-oriented, while youth athletes high in mastery were more likely to perceive a mastery climate. More cross-cultural research is needed to understand the effects of motivational climate on perceived competence better.

Limitations. Although this was a comprehensive and what seemed to be an exhaustive search of the literature, there are a few limitations. As with any meta-analysis, the quality of the conclusions is limited by the correlations available in the research literature. This meta-analysis was limited to research articles published in English, which could be a contributing factor to finding only one cross-cultural research article for motivational climate. However, there were only 15 research articles in total for motivational climate included in this meta-analysis.

Additionally, the university did not have access to SportDiscus, a bibliographic database for sports and sports medicine research, which might have resulted in relevant articles being missed. However, a comparison between the recent similar meta-analysis done by Lochbaum et al. (2016) did not reveal any substantial differences in the articles included in their meta-analysis and the current meta-analysis.

Gender differences could not be measured as most of the research studies that included both males and females did not provide separate correlations for each group but rather collapsed across gender.

Conclusion. Despite these limitations, this meta-analytic review adds to the research literature on AGT and youth sports. Goal orientations seem to have a stronger relationship to

perceived competence than does motivational climate, suggesting that individual goal orientation is more relevant in the athletic domain than the motivational climate set by others. However, the motivational climate set by coaches still had a significant effect on youth athletes' perceived competence. Coaches who focused on self-referenced task performance had youth athletes who reported higher levels of perceived competence compared to coaches who focused on winning. Ego orientation (an individual motivational style) was positively related to perceived competence. However, it appears that looking only at the zero-order correlations between goal orientations and perceived competence may obscure the more complex pattern of relationships here. Although not tested directly by this meta-analysis, the impact of having a higher ego orientation may vary as a function of the level of task orientation, and this may help explain the lack of consistency in the literature.

Study 2

The purpose of Study 2 was to understand how perceived competence develops in youth athletes across a sports season. However, rather than solely focusing on competitive (DeFreese & Smith, 2014), or even recreational athletes (Saville et al., 2014), as is typically done, this study compared youth athletes at both levels. This approach allows for an investigation, from a developmental perspective, of the factors and relationships that may be influential to the development of perceived competence at different levels of competition. In other words, although previous research has identified the importance of perceived competence for higher positive self-perceptions and higher levels of mastery orientation and has established various contexts which support this development in youth, the mode by which perceived competence differs across competitive levels remains un-investigated and unknown.

Study 2 investigates the relationship between perceived competence and sources of information across a sports season. Motivational variables (see Figure 16; goal orientations, perceived climate) and relationship variables (see Figure 17; mom, dad, coach and friend) were the focus of this research study. The hypotheses that follow reflect that these variables can be disaggregated into both a within-level and between levels of variability.

Demographic/Developmental Variables

Hypotheses for age, sex and competitive level of play.

H1) Based on the literature review for this research study, it was expected that perceived competence would decrease with age.

H2) Based on the literature review for this research study, it was expected that there would not be any differences in perceived competence between male and female youth athletes.

H3) Based on the literature review for this research study, it is expected that competitive athletes would report higher levels of perceived competence.

Motivational Variables

Hypotheses for between-persons (interindividual variability) for the motivational variables are as follows:

H1) Youth athletes who report higher levels of task orientation, relative to others, were expected to report high levels of perceived competence.

H2) Youth athletes who report higher levels of ego orientation, relative to others, were expected to report lower levels of perceived competence.

H3) Youth athletes who report higher levels of perceived Coach Mastery Climate, relative to others, were expected to report higher levels of perceived competence.

H4) Youth athletes who report higher levels of perceived Coach Performance Climate, relative to others, were expected to report lower levels of perceived competence.

H5) Youth athletes who report higher levels of perceived Peer Mastery Climate, relative to others, were expected to report higher levels of perceived competence.

H6) Youth athletes who report higher levels of perceived Peer Performance Climate, relative to others, were expected to report higher levels of perceived competence.

Hypotheses for within-persons (intraindividual variability) are as follows:

H1) Youth athletes who report higher levels of task orientation, than usual, are expected to report high levels of perceived competence.

H2) Youth athletes who report higher levels of ego orientation, than usual, are expected to report lower levels of perceived competence.

H3) Youth athletes who report higher levels of perceived Coach Mastery Climate, than usual, are expected to report higher levels of perceived competence.

H4) Youth athletes who report higher levels of perceived Coach Performance Climate, than usual, are expected to report lower levels of perceived competence.

H5) Youth athletes who report higher levels of perceived Peer Mastery Climate, than usual, are expected to report higher levels of perceived competence.

H6) Youth athletes who report higher levels of perceived Peer Performance Climate, than usual, are expected to report higher levels of perceived competence.

Relational Variables

Hypotheses for between-persons (interindividual variability) for the relationship variables are as follows:

H1) Youth athletes who report higher levels of friend relationship quality, relative to others, are expected to report high levels of perceived competence.

H2) Youth athletes who report higher levels of coach quality, relative to others, are expected to report high levels of perceived competence

H3) Youth athletes who report higher levels of dad relationship quality, relative to others, are expected to report higher levels of perceived competence.

H4) Youth athletes who report higher levels of mom relationship quality, relative to others, are expected to report higher levels of perceived competence.

Hypotheses for within-persons (intraindividual variability) for the relationship variables are as follows:

H1) Youth athletes who report higher levels of friend relationship quality, than usual, are expected to report high levels of perceived competence.

H2) Youth athletes who report higher levels of coach relationship quality, than usual, are expected to report high levels of perceived competence.

H3) Youth athletes who report higher levels of dad relationship quality, than usual, are expected to report higher levels of perceived competence.

H4) Youth athletes who report higher levels of mom relationship quality, than usual, are expected to report higher levels of perceived competence.

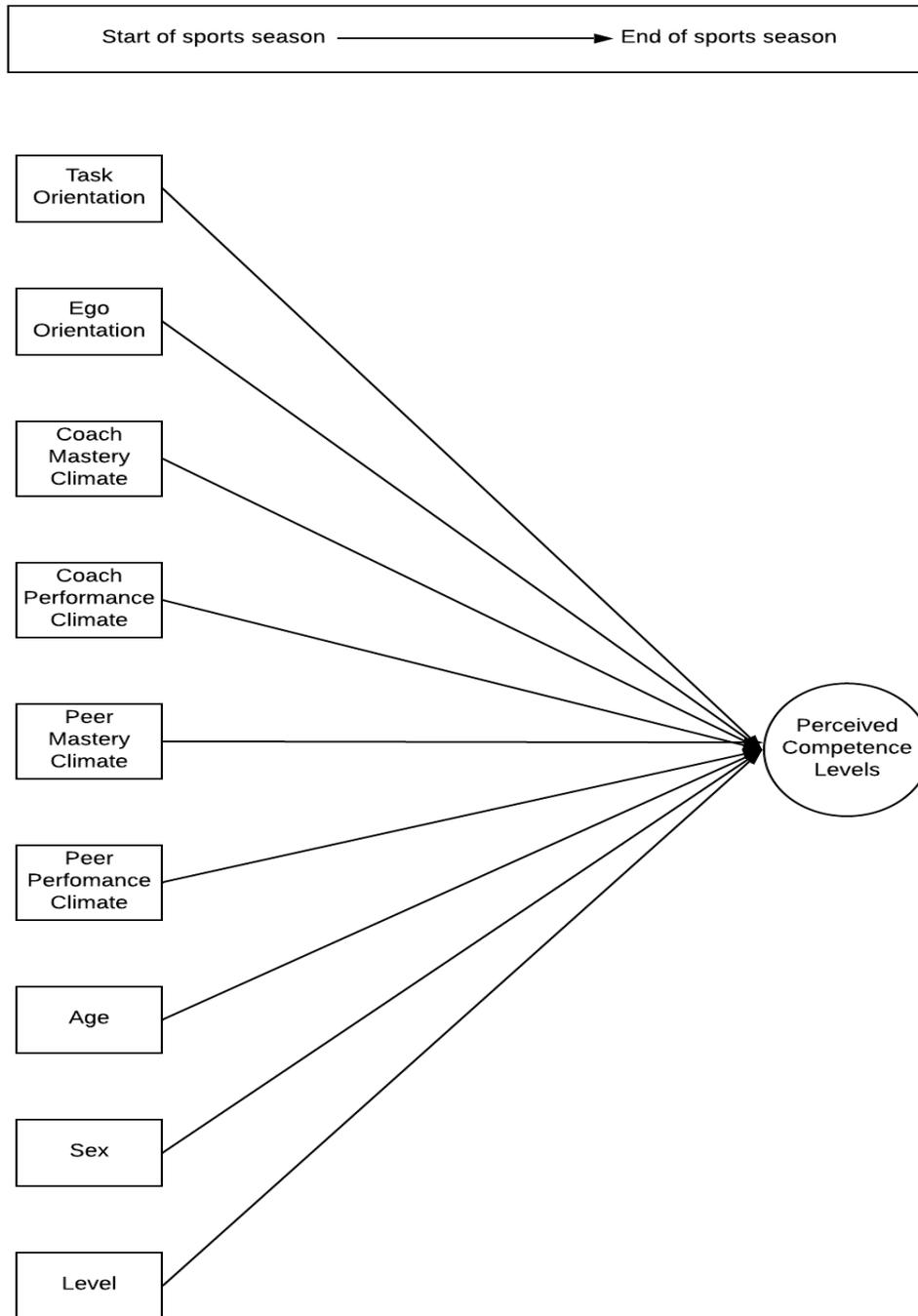


Figure 16. Hypothesized model showing the relationship between motivational variables, competitive level, age, and sex with perceived competence.

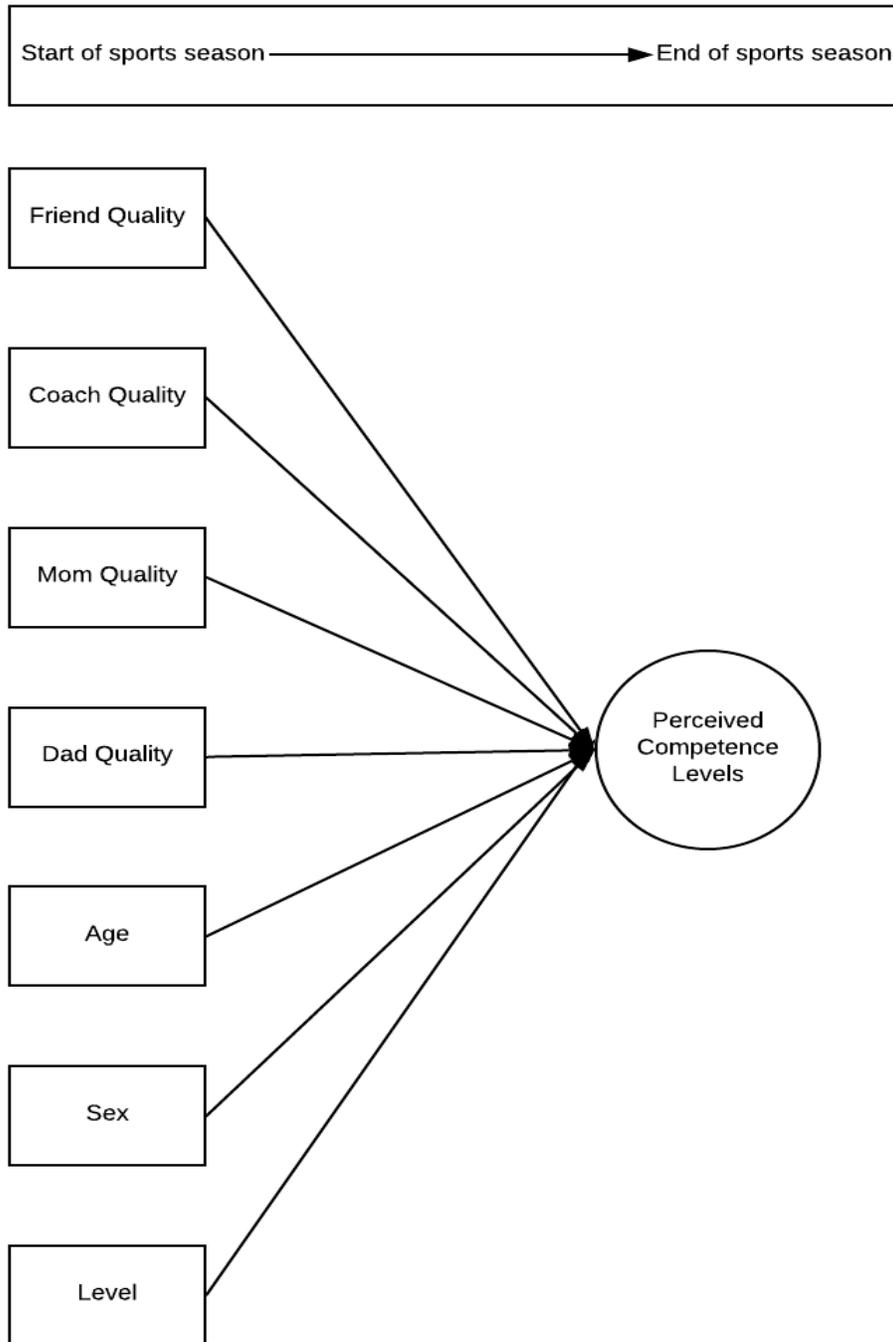


Figure 17. Hypothesized model showing the relationship between relationship variables, competitive level, age, and sex with perceived competence.

Method

Participants. One hundred eighty-two youth athletes (95 males, 87 females) ranging in age from 6 to 17 years old ($M_{age} = 11.88$, $SD = 2.34$). One hundred eighteen youth athletes were competitive players (60 males, 58 females) while 64 players were recreational (35 males, 29 females). Youth athletes were considered to be playing at the competitive level if their team was confirmed to be playing in a competitive league by the sports association. Youth athletes who were younger than eight years old or older than 16 years old ($n=2$) tended to be siblings of youth athletes already in the study. These youth athletes asked to be allowed to participate in this research study. In the case of very young athletes, parents assisted these athletes in completing the questionnaire by reading questions as necessary.

Twenty-eight different sports associations participated in this research study. One sports association was from Nova Scotia, two sports associations were from Quebec, and the remaining 25 sports associations were from Ontario. The majority of male youth players ($n = 89$) were from the National Capital Region while approximately half of the female youth athletes ($n = 40$) were from other communities in Ontario and Nova Scotia. The youth athletes participated in ringette ($n=3$), volleyball ($n=3$) and ice hockey ($n=176$).

Thirty-two of the youth athletes came from three AAA competitive teams who completed the questionnaires following a team practice three times across the sports season. The remaining 150 youth athletes completed the questionnaires individually across the sports season, either paper-based or online. Youth athletes were allowed to select whether they wanted to complete the questionnaire online or as a hardcopy.

Procedure. Sports associations located in Ontario, Nova Scotia and Upstate New York were contacted by email to invite their organization to participate in this research study (see Appendix B). Several sports organizations requested presentations to their board of directors before committing to the research study. Once a sports association agreed to participate, they were provided with a recruitment notice that they could post on their website or email to parents (see Appendix C). However, each sports organization determined its procedure for contacting the parents of youth athletes. These procedures ranged from the team coach/manager distributing and then collecting the signed permission forms, to the sports organization sending an email to all parents with the study contact information, and to sports associations posting the study information on their websites. Additional youth athletes were recruited via word of mouth, for example, parents with a child on one team asking if their other child's team could participate.

Interested parents were provided with a letter or email explaining the research along with the permission form to complete before their child was allowed to participate in the research study (see Appendix D). The permission form was available as either a hardcopy form or via a link to Qualtrics sent by email (See Appendix E and Appendix G). Parents were only required to provide consent for their child's participation at the start of the sports season.

Youth athletes were contacted via their parents to complete a short questionnaire at three-time points across the sports season, September, December and March. Youth athletes were randomly assigned to one of the three forms upon entering the study. Form numbers were recorded to ensure youth athletes moved sequentially through the three forms which were part of a three-form planned missing data design discussed in more detail below in the analysis plan section.

Both a hard-copy or online version of the questionnaire, on Qualtrics, were available for youth athletes to complete. Hard-copy questionnaires were either completed at the sport setting with other team members or taken home to be completed and then returned. In the case of online questionnaires, a link to the questionnaire was sent directly to the parent to share with their child. Before completing the questionnaire at each time point, youth athletes provided individual written assent to participate in this research study (See Appendix F and Appendix H). At the end of the research study, parents and youth athletes were provided with a debriefing sheet (see Appendix I)

As a thank you for participating in this research study, each time a youth athlete completed a questionnaire, they were entered into a raffle for a team party worth \$1000.00. Youth athletes received a bonus entry into the raffle for completing all three questionnaires for a maximum of four entries into the raffle.

The questionnaire took approximately 30 minutes to complete and contained assessments of relationship quality variables, motivational variables and demographic variables. The relationship quality variables were perceptions of a friend, mom and dad relationship quality and were contextualized to the sport setting. The sport-related motivational variables were goal orientations, perceived motivational climate, and perceived competence.

Measures.

Demographics and sports information. This short behavioural engagement questionnaire (Appendix J) was developed specifically for this research study. This questionnaire has questions about the participant (i.e., age) and the team (i.e., the number of practices each week).

Friendship quality. The Sports Friendship Quality Scale (SFQS; Weiss & Smith, 1999) was used to assess perceptions of friendship quality with a best friend on the sports team

(Appendix K). The SFQS assesses sports friendship quality through 22 items tapping positive relationship dimensions (self-esteem enhancement and supportiveness, loyalty and intimacy, things in common, companionship and pleasant play, conflict resolution) as well as relationship conflict. Example items are: 'After I make mistakes, my friend encourages me' (self-esteem enhancement and supportiveness), 'My friend looks out for me' (loyalty and intimacy), and 'My friend and I make up easily when we have a fight' (conflict resolution). Respondents were asked to think about their best friend on their team while filling out the questionnaire to cue them to focus on only that particular friend when answering the questions. Responses are on a 5-point scale (1 = not at all true; 5 = really true) where higher scores indicate higher friendship quality or relationship conflict. The scores across items were averaged to create both a global friendship quality score and a global friendship conflict score. The SFQS has good content, factorial and construct validity (Weiss & Smith, 1999). Additionally, internal consistency and test-retest reliability were demonstrated (A. L. Smith, Balaguer, et al., 2006; Weiss & Smith, 1999). The internal consistency of the SFQS for both subscales in this thesis was measured using Cronbach's alpha for each time point and ranged from .89 to .93.

Parent-child relationship quality. A modified version of the Sports Friendship Quality Questionnaire (SFQS; Weiss & Smith, 1999) was used to assess perceptions of the quality of mother-child and father-child relationships, respectively, relative to their sport (see Appendix L and Appendix M). As discussed by Ullrich-French and Smith (2006), the assessment of parent and friend relationships with the same inventory was determined to be the most appropriate because of the absence of an established sport-specific parent-child relationship quality measure. Five SFQS items referring to direct involvement in their sport were excluded because they do not adapt well to the parent-child relationship in the sport. The resulting measure of parent-child

relationship quality consisted of 14 items assessing positive and three items assessing conflict relationship dimensions for each parent. This approach allowed for a direct comparison of the perceived quality of multiple relationships. Participants completed a separate measure for each of their parental figures (i.e., whomever a respondent deemed to fulfil the primary mother role and father role, respectively, in her/his life; not required to be the biological parent). An example item is 'After I make mistakes, my mother/father encourages me' (self-esteem enhancement and supportiveness) with responses falling on a 5-point scale (1 = not at all true; 5 = really true). Responses to items from positive dimensions will be averaged to produce the parent relationship quality score. The Parent-Child Relationship Quality Questionnaire demonstrated good internal consistency reliability and the original six-factor SFQS model was a good fit for the mother and father data (Ullrich-French & Smith, 2006, 2009). The internal consistency of the Parent-Child Relationship Quality Questionnaire for both subscales in this thesis was measured using Cronbach's alpha for each time point and ranged from .81 to .93.

Coach relationship quality. The Caring Climate Scale CCS; (Newton et al., 2007) was used to assess players' perceptions of the coach feedback as reflective of relationship quality with youth athletes (Appendix N). An example question is "The coaches listen to players." The participants indicated their level of agreement with each item on a 5-point scale (1 = strongly disagree; 5 = strongly agree). The scores across the thirteen items were averaged to create a global relationship quality score. CCS has been shown to have good internal consistency (Gould, Flett, & Lauer, 2012; Iwasaki & Fry, 2016), good convergent and discriminant validity (M. D. Fry & Gano-Overway, 2010). The internal consistency of the Caring Climate Scale for this study was measured using Cronbach's alpha for each time point and ranged from .91 to .93.

Coach motivational climate. The Motivational Climate Scale for Youth Sports (MCSYS; Ronald E. Smith, Cumming, & Smoll, 2008) was used to measure athlete perceptions of coach-initiated motivational climate (Appendix O). The MCSYS measures the degree to which youth athletes feel that the sports environment emphasizes mastery or self-referenced objectives, versus social comparison or performance orientations. The MCSYS was designed for youth sports samples. The scales items range from a Flesh-Kincaid reading grade of 1.8 – 4.0, with an average elementary school grade level of 3.30. An example mastery item is: ‘The coach made players feel good when they improved a skill.’ An example performance scale item is: ‘Players were taken out of games if they made a mistake.’ The participants indicated their level of agreement with each item on a 5-point scale (1 = not at all true; 5 = very true). The MCSYS consists of six mastery-orientation questions and six performance-orientation questions. MCSYS has shown good internal consistency (R. E. Smith et al., 2009a) and adequate test-retest reliability (R. E. Smith et al., 2008) The internal consistency of the MCSYS for this study was measured using Cronbach’s alpha for each time point and ranged from .80 to .83 for Mastery Climate and .69 to .83 for Performance Climate.

Perceived competence. Perceived competence in sports was measured using two separate scales, the six-item athletic competence subscale of the Self-Perception Profile for Children (Harter, 2012) as modified in previous research (Ullrich-French & Smith, 2006) and the perceived competence subscale of the Intrinsic Motivation Inventory (PC-IMI; McAuley, Duncan, & Tammen, 1989).

Athletic competence subscale. Items were presented in a structured alternative format for the athletic competence subscale, scored from 1 to 4, with higher scores representing higher competence perceptions (see Appendix P). An example item is: “Some kids do very well at *their*

sport BUT Other kids don't feel that they are very good when it comes to *their sport*." The athletic competence subscale has demonstrated good factorial validity, convergent validity and construct validity (Harter, 2012a) and good internal reliability (Babkes & Weiss, 1999; Price & Weiss, 2013). The internal consistency of the Athletic Competence Subscale for this study was measured using Cronbach's alpha for each time point and ranged from .094 to .48. Other research studies have also found the athletic competence subscale to have low internal reliability (Kipp & Weiss, 2015; Theeboom, De Knop, & Weiss, 1995; Ullrich-French & Smith, 2006; Weiss & Amorose, 2005). Due to these low values, the Athletic Competence Subscale was not used in any of the analyses.

IMI. The PC-IMI was used to measure perceived competence in sport (Appendix Q). An example item is "I think I am pretty good at sports." The participants will indicate how true each statement is for them using a 7-point scale (1 = totally disagree; 7 = totally agree). The PC-IMI has demonstrated good internal reliability and construct validity (Markland & Hardy, 1997; McAuley et al., 1989). The internal consistency of the IMI for this study was measured using Cronbach's alpha for each time point and ranged from .84 to .86.

Peer acceptance. Perceived peer acceptance in sports was measured using the social competence subscale of the Self-Perception Profile for Children as modified in previous research (Appendix S; Ullrich-French & Smith, 2006; M. R. Weiss & Smith, 1999). This subscale consists of six items that are presented in a structured-alternative format, where the participant selects one of two options that are most personally descriptive and then indicates whether the descriptive statement is sort of true or really true. Items are scored from 1 to 4, with higher scores reflecting higher perceptions of acceptance by peers. Item scores were averaged to create an overall peer acceptance score. An example item is: "Some kids are popular with others in

their sport BUT Other kids are not very popular in *their sport*.” The social competence subscale of the Self-Perception Profile for Children demonstrated good internal reliability and convergent validity (Harter, 2012a; A. L. Smith, 2000; A. L. Smith, Balaguer, et al., 2006). The internal consistency of the Peer Acceptance Subscale for this study was measured using Cronbach’s alpha for each time point and ranged from .31 to .53. Low values for internal consistency were found in previous research studies (Ombudsmen et al. 2005; Ullrich-French & Smith 2006; Smith et al. 2006). Due to the low values for internal reliability found in this thesis, the Peer Acceptance Subscale was not used in any of the analyses.

Peer motivational climate. Perceptions of a mastery- involving and a performance- involving climate was assessed using the Peer Motivational Climate Scale in Youth Sports (Appendix T; Ntoumanis & Vazou, 2005). The stem for each item, “On our team we ...”, is followed by a description of behaviour (e.g., “... we help each other out”), with responses given on a 7- point scale (1 = strongly disagree; 7 = strongly agree). Participants completed ten items (five mastery, five performance). The internal consistency of the Peer Motivational Climate Scale for this study was measured using Cronbach’s alpha for each time point and ranged from .87 to .91 for Mastery Climate and .72 to .78 for Performance Climate.

Goal orientation. The 12-item Achievement Goal Scale for Youth Sports (AGSYS; Cumming, Smith, Smoll, Standage, & Grossbard, 2008) was used to assess the participant’s goal orientation (i.e., mastery or performance orientation; Appendix T). The AGSYS was developed for younger populations. All items have readability levels below grade 4 (mean reading grade = 2.85). An example mastery item is: “My goal is to learn new skills and get as good as possible.” An example performance item is: “The most important thing is to be the best athlete.” Responses fall on a 5-point scale (1= not at all true; 5 = very true), where higher scores indicate greater

mastery- or performance-orientation. The internal consistency of the Achievement Goal Scale Youth Sports for this study was measured using Cronbach's alpha for each time point and ranged from .75 to .81 for Mastery Orientation and .91 to .93 for Ego Orientation.

Analysis plan

Missing data design. A planned missing data (PMD) approach involves intentionally introducing missingness into the data collection process in a way that results in missing data patterns that are "missing completely at random (MCAR)." According to Craig Enders (2010), methodologists had been studying missing data problems for nearly a century until breakthroughs came in the 1970s with the advent of maximum likelihood estimation routines and multiple imputations. Around the same time, Rubin (1976), introduced a theoretical framework which included three different types of missingness, missing completely at random, missing at random (MAR) and missing not at random (MNAR).

Missing data mechanisms. When data is MCAR, there is no systematic cause for missingness. Therefore, the probability of missingness on Y is unrelated to the other measured variables or Y itself. An example of this would be when participants are absent from school when researchers were there collecting data on math cognition. When other variables can explain the reason for a data's missingness in the data but not by Y itself, then it is considered MAR. An example of this would be when the researcher notices that the boys in the school were more likely to be missing data on math cognition. When data is missing for a reason that cannot be explained by other measured variables, and it related to Y itself, then it is considered MNAR. An example of this would be students who are weak in math cognition drop out of the research study.

Why is the missingness mechanism important? According to Rubin's (1976) missing data theory, there are two sets of parameters: the parameters that address the substantive research question (i.e. the parameters that you would have estimated had there been no missing data) and the parameters that describe the probability of missing data (i.e., ϕ). In some situations, the parameters that describe the probability of missing data may influence the estimation of the substantive parameters of interest. While there is generally no way to determine or estimate the parameters that describe the propensity for missing data, Rubin (1976) clarified the conditions that needed to exist to accurately estimate the substantive parameters of interest without also knowing the parameters of the missing data distribution. Rubin (1976) demonstrated that these conditions depend on how the data is analyzed.

Modern missing data techniques. Traditional missing data techniques either rely on deletion or single imputation methods. Deletion techniques, such as listwise deletion, tend to be the default mechanism in many statistical software programs. Listwise deletion deletes any cases with missing values. The major advantage of listwise deletion is that it is simple to implement and results in a complete data set which allows for the use of standard statistical analyses. However, listwise deletion has many disadvantages, such as a reduction in power due to the reduced sample size.

Listwise deletion can remove a substantial number of cases even with small amounts of missingness since any case with a single missing value is removed. This potential substantial reduction in sample size is why pairwise deletion, which deletes on an analysis-by-analysis basis, can seem like a better alternative to listwise deletion, which results in more cases for each of the analyses. However, this results in different sample sizes for each of the analyses used in the data, inaccurate standard errors and each element in the correlation matrix being based on a unique

subsample. Both listwise and pairwise deletion techniques require the missingness to be MCAR. Otherwise, the parameter estimates are biased.

Single imputation methods, such as mean imputation, regression imputation and stochastic regression, deal with missingness by filling in the missing values creating a complete data set. There are two major advantages of single imputation techniques. The first advantage is that there is not a reduction in power from decreased sample size through deletion. The second advantage is that single imputation methods produce a complete data set which allows for standard statistical analyses.

Modern missing data techniques, such as full information maximum likelihood (FIML) and multiple imputations (MI), also fill in the missing values in the data. However, these techniques do not suffer from the two most common disadvantages of the previous single imputation techniques.

Current research study. The study consisted of a longitudinal design with three-time points across a sports season, October 2017, December 2017 and March 2018. Since this research study used a planned missing data approach, each questionnaire contained a subset of all the measures (see Table 10).

Table 10

Questionnaires included in each of the forms.

Measure	Form 1	Form 2	Form 3
Demographics	X	X	X
Athletic Competence	X	X	X
IMI	X	X	X

SFQS	X		
CCS	X		
Peer Acceptance	X		
SPQS-MOM		X	
MCSYS		X	
PMCSY		X	
SPQS-DAD			X
Goal Orientation			X

Notes: Questionnaires with an X were included on that form; Athletic competence = athletic competence subscale of the Self-Perception Profile for Children; IMI = perceived competence subscale of the Intrinsic Motivation Inventory; SFQS = Sports Friendship Quality Scale; CCS = Caring Climate Scale; Peer acceptance = social competence subscale of the Self-Perception Profile for Children; SPQS-MOM = Sports Parents Quality Scale for MOM; MCSYS = Motivational Climate Scale for Youth Sports; PMCSY = Peer Motivational Climate in Youth Sports; SPQS-DAD = Sports Parents Quality Scale for DAD; AGSYS = Achievement Goal Scale for Youth Sports.

Youth athletes were randomly assigned to receive a specific version of the questionnaire for the first time point. The random assignment consisted of being assigned to Form 1, Form 2 or Form 3 based on the order of receiving parental consent. For the following two time points, youth athletes completed the next form in the sequence (see Figure 18).

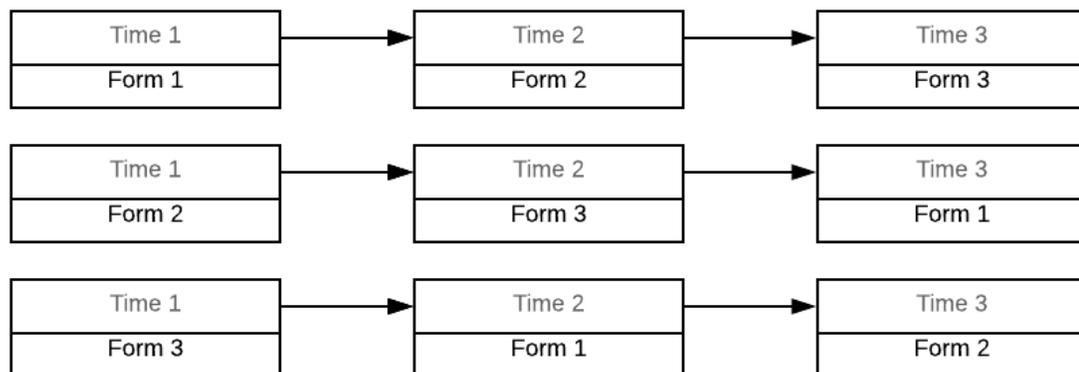


Figure 18. Youth athletes order of form completion based on random assignment at the start of the study.

Data preparation. All the data collected for this thesis were converted to a long format (Raudenbush & Bryk, 2002), where multiple cases per youth athlete represented each time point collected. Time-invariant covariates, such as age, level of play and average friendship quality, appeared in the data set as the same score across time-points for a single youth-athlete. Time-varying covariates such as perceived friendship quality at time t were person-mean centered and appear as deviation scores for youth-athletes. Age was grand mean-centered for this analysis.

The outcome variable perceived competence was screened for outliers based on the guidelines that semistudentized residual scores greater than four are considered outliers (Tabachnick & Fidell, 2013). Continuous predictor variables were screened for outliers using the guideline that leverage values greater than 0.5 are considered outliers (Tabachnick & Fidell, 2013). When perceived competence scores met the criteria for both of these guidelines, DFFITS were utilized to determine their influence on the model. Across the sports season, six observations across four youth-athletes were identified as outliers based on these criteria. A sensitivity analysis, including and excluding these observations, showed virtually identical results for the model parameters and the pattern of significance. Therefore, these observations were retained in the analyses. Additionally, visual inspection of the data confirmed a change in relatively linear form for perceived competence and the predictor variables of interest. These findings support using a linear model for these analyses.

Developing the model. The data used in this thesis is repeated measures data collected over three time points which can be considered nested within the youth athlete. Nested data violates the assumptions of most Ordinary Least Squares (OLS) techniques with the exception of

repeated measures ANOVA. Most data collected, including this data set, do not meet the necessary assumptions of a repeated-measures ANOVA: 1) all participants are assessed according to the same schedule; 2) occasions are equally spaced; and 3) no missing data.

Multilevel Modeling (MLM) is a more flexible approach to modelling nested data (Raudenbush & Bryk, 2002). MLM allows for cluster-level equations to be predicted to account for dependency in the data. Fixed and random effects are estimated using MLM. Fixed effects are similar to OLS regression coefficients in that they estimate population parameters while random effects estimate within and between-person deviations. These deviations are estimated by the variance parameters. MLM allows for the separation of the variance into within and between levels.

This ability to separate variance into within and between levels allows for the within and between-person variability to be disaggregated for a time-varying co-variate to permit separate simultaneous tests of the relations between two repeated measures variable. This allows for two distinct questions about youth athletes' friendship quality and their perceived competence: 1) Do youth athletes who have higher friendship quality than usual at a given time in the sport season have higher perceived competence?; and 2) Do youth athletes who, on average, report higher friendship quality relative to others, report higher perceived competence? The variance is disaggregated across the within and between levels by using a person-mean-centered time-varying covariate at level-1 while reintroducing the time-invariant persons' cluster mean at level-2 (Howard, 2015).

This thesis tested a two-level person-mean centered model (i.e., level-1 as within-person differences and level-2 as between-person differences) which allows the intercept and slope to

vary across individuals. The two-level multilevel model for an outcome variable y with no predictors is

$$y_{ti} = \beta_{0i} + r_{ti} \quad 6$$

where

β_{0i} is the random intercept, which takes on the mean value of y for each person i ,

r_{ti} is the residual at time point t for person i

The first step in model building in multilevel modeling is to estimate the unconditional model. The unconditional model allows the intercept (β_{0i}) to randomly vary across individuals.

The variance in the random intercept is expressed in the level-2 equation as

$$\beta_{0i} = \gamma_{00} + \mu_{0i} \quad 7$$

where

γ_{00} is the grand mean of perceived competence across all persons

μ_{0i} is the deviation from the grand mean for person i

Substituting equation (7) into equation (6) results in the reduced form of the equation

$$y_{ti} = \gamma_{00} + \mu_{0i} + r_{ti} \quad 8$$

This allows for an understanding that the variance in any repeated measure can be decomposed into two parts (Howard, 2015): (1) The amount by which a given person i deviates from the grand mean of all persons (μ_{0i} ; between-person variance); and (2) the amount by which a person deviates from his or her own mean (r_{ti} ; within-person variance).

This means that a youth athlete's perceived competence score at any given time point is a combination of grand mean perceived competence score (γ_{00}) plus an average deviation for person i from the grand mean (μ_{0i}) and a time-specific deviation for youth-athlete i at time t (r_{ti}).

Adding in covariates. The following example using friend quality (FR) expands these equations to include the person-mean centered time-varying covariate (i.e., level-1; FR_{ti}^{PMC}) and the time-invariant person-mean (i.e., level-2; MFR_i).

Level 1:

$$y_{ti} = \beta_{0i} + \beta_{1t}(FR_{ti}^{PMC}) + r_{ti} \quad 9$$

A youth-athletes perceived competence score consists of their mean perceived competence across a sports season (β_{0i}) plus the effect of friendship quality (β_{1t}) at time t for youth-athlete i and the deviation for youth-athlete i at time t (r_{ti}).

Level-2:

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(MFR_i) + \mu_{0i} \quad 10$$

A youth athlete's perceived competence score consists of their mean perceived competence across a sports season (γ_{00}) plus the effect of average friendship quality (γ_{0i}) at time t for youth-athlete i and the average deviation for youth-athlete i (μ_{0i}).

Substituting equation (10) into equation (9) results in the reduced form of the equation or full model:

$$y_{ti} = \gamma_{00} + \gamma_{01}(MFR_i) + \gamma_{10}(FR_{ti}^{PMC}) + \mu_{0i} + r_{ti} \quad 11$$

where

γ_{00} is the grand mean of perceived competence across all youth-athletes

γ_{01} is the effect of average friendship quality across the sports season for youth-athlete i

γ_{10} is the effect of friendship quality at time t for youth-athlete i

μ_{0i} is the deviation from the grand mean for youth-athlete i

r_{ti} is the deviation for youth athlete i at time t

- MFR_i is the mean friendship quality for youth-athlete i
- FR_{ti}^{PMC} is the person-mean-centered friendship quality for youth-athlete i at time t (i.e., the deviation from the person-mean)

Building on the example above, the final model for the relationship quality is:

$$\begin{aligned}
 PC_{ti} = & \gamma_{00} + \gamma_{01}(MMom_i) + \gamma_{02}(MDad_i) + \gamma_{03}(MFR_i) + \gamma_{04}(MCAre_i) \\
 & + \gamma_{05}(Age_i) + \gamma_{06}(Sex_i) + \gamma_{07}(Level_i) + \gamma_{10}(Dad_i^{PMC}) \\
 & + \gamma_{20}(FR_i^{PMC}) + \gamma_{30}(Care_i^{PMC}) + \mu_{0i} + r_{ti}
 \end{aligned}$$

where

- γ_{00} is the grand mean of perceived competence across all youth-athletes
- γ_{01} is the effect of average mom quality across the sports season for youth-athlete i
- γ_{02} is the effect of average dad quality across the sports season for youth-athlete i
- γ_{03} is the effect of average friend quality across the sports season for youth-athlete i
- γ_{04} is the effect of average coach quality across the sports season for youth-athlete i
- γ_{05} is the effect of age across the sports season for youth-athlete i
- γ_{06} is the effect of sex across the sports season for youth-athlete i
- γ_{07} is the effect of competitive level across the sports season for youth-athlete i
- γ_{10} is the effect of dad quality at time t for youth-athlete i
- γ_{20} is the effect of friend quality at time t for youth-athlete i
- γ_{30} is the effect of coach quality at time t for youth-athlete i
- μ_{0i} is the deviation from the grand mean for youth-athlete i
- r_{ti} is the amount youth athlete I deviates from his or her mean at time t

The final model for the motivational variables is:

$$\begin{aligned}
 PC_{ti} = & \gamma_{00} + \gamma_{01}(MTask_i) + \gamma_{02}(MEgo_i) + \gamma_{03}(MPeerM_i) \\
 & + \gamma_{04}(MCOAM_i) + \gamma_{05}(Age_i) + \gamma_{06}(Sex_i) + \gamma_{07}(Level_i) \\
 & + \gamma_{10}(Task_{ti}^{PMC}) + \gamma_{20}(Ego_{ti}^{PMC}) + \gamma_{30}(PeerM_{ti}^{PMC}) \\
 & + \gamma_{40}(COAM_{ti}^{PMC}) + \mu_{0i} + r_{ti}
 \end{aligned}$$

where

- γ_{00} is the grand mean of perceived competence across all youth-athletes
- γ_{01} is the effect of average task orientation across the sports season for youth-athlete i
- γ_{02} is the effect of average ego orientation across the sports season for youth-athlete i
- γ_{03} is the effect of average peer mastery climate across the sports season for youth-athlete i
- γ_{04} is the effect of average coach mastery climate across the sports season for youth-athlete i
- γ_{05} is the effect of age across the sports season for youth-athlete i
- γ_{06} is the effect of sex across the sports season for youth-athlete i
- γ_{07} is the effect of competitive level across the sports season for youth-athlete i
- γ_{10} is the effect of task orientation at time t for youth-athlete i
- γ_{20} is the effect of ego orientation at time t for youth-athlete i
- γ_{30} is the effect of peer mastery climate at time t for youth-athlete i
- γ_{40} is the effect of coach mastery climate at time t for youth-athlete i
- μ_{0i} is the deviation from the grand mean for youth-athlete i
- r_{ti} is the amount youth athlete i deviates from his or her mean at time t

Missing data.

Missing values. SPSS Missing Values Analysis was used at each time point to determine the rate of missing values. This was necessary to determine the rate of missing that was not part of the planned missing data analysis. The rate of missingness was less than 5% on all variables except Harter's Athletic Competence Subscale. However, since this scale is not included in the analysis due to poor internal reliability, so this is not an issue.

At T1, 169 youth athletes participated, at T2 147 youth athletes participated and finally, at T3 132 youth athletes participated in this thesis. At T2, an additional 13 youth athletes joined the study bringing the total number of youth athletes to 182 participants. Approximately 65% of the youth athletes participated in all three time points, while approximately 90% participated in at least two of the three-time points (see Table 11).

Table 11

The number of youth athletes completing three or fewer time points.

Time Points Completed	Number of Participants	Percentage
3	119	65.38
2	45	24.73
1	18	9.89

Correlates of missingness. A binary logistic regression was performed to examine sample attrition. Participants who participated in all three-time points were coded as 1 (complete), whereas sports players who participated only once or twice were coded as 0 (not complete). The missing data was examined in two steps. First, demographic variables,

competitive level, age and gender, were entered in step 1 to predict missing data. Gender (dummy coded as male = 0, female = 1) was defined as a categorical variable, and the first group was indicated as the reference category. The demographic variables were not a significant predictor of missingness, $\chi^2(3) = 2.66, p = 0.45$.

In the second step, Time 1 measures which were included (i.e., perceived competence) was added, and the analysis was also not significant indicating that the study variables of interest did not contribute significantly to the prediction of missing data. These results suggest that the demographic variables and the study variables of interest were unrelated to missingness. The data appears to fulfill the missing at random assumption.

Results

The main focus of Study 2 was to examine how perceived competence changes across a sports season along with youth athletes' sources of competence information. These sources of information include goal orientations (i.e., task and ego orientation), perceived motivational climates (i.e., both peers' and coaches' mastery climates), and relationship quality (i.e., support from friends, parents and coaches). Additionally, this research study was interested in whether or not perceived competence had a linear trajectory across a sports season.

Descriptive statistics. The means, standard deviations and Pearson's product-moment correlations between the relationship quality variables and perceived competence are shown in Table 12. As expected, all the relationship quality variables and perceived competence were significantly and positively correlated. On average, youth athletes reported high levels of relationship quality with their coaches, parents and friends (i.e., all the means are approximately 4 on a 5-point scale).

Table 13 contains the means, standard deviations and Pearson's product-moment correlations between the motivational variables and perceived competence. As expected, the mastery variables, task orientation and perceived mastery climates, were significantly positively correlated with perceived competence. The correlations between the perceived performance climates and perceived competence, both peer and coach, were not significant. Based on the results of the meta-analysis, perceived coach climate was expected to be significantly and negatively related to perceived competence. However, since the perceived performance climate was not significantly related to perceived competence, these variables were not included in the multi-level analysis.

Table 12

Means, standard deviations and correlations for the relationship variables.

	Mean(SD)	1	2	3	4	5	6	7	8	
1	Age	11.82 (2.23)	-							
2	Sex	-	-0.07	-						
3	Level	-	-0.13	0.04	-					
4	PC	6.10 (0.79)	-0.26***	0.07	0.16*	-				
5	CARE	4.08 (0.59)	-0.09	0.02	0.01	0.18*	-			
6	FR	4.06 (0.50)	-0.07	0.02	0.20**	0.34***	0.26***	-		
7	MOM	3.99 (0.51)	-0.27***	0.02	0.02	0.22**	0.12	0.32***	-	
8	DAD	3.97 (0.58)	-0.16*	0.05	0.02	0.30***	0.09	0.37***	0.58***	-

Note. Level = competitive level (i.e., competitive or recreational); PC = perceived competence; CARE = coach relationship quality; FR = friend quality; MOM = mom quality; DAD = dad quality.

Separate multivariate regressions were run using Mplus version 8.2 to look at differences based on gender and competitive level. Maximum likelihood techniques were used to handle

missing data. Female youth athletes (coded 1) reported lower task orientation, lower ego orientation, and lower perceived performance climates, for both peers and coaches, compared to male youth athletes (coded 0; see Table 14). Except for task orientation (Moreno Murcia, Cervelló Gimeno, & González-Cutre Coll, 2008), these differences were in the expected directions (Chin, Khoo, & Low, 2012; Vazou, 2010). There were no significant differences for male and female athletes for reported perceived competence, relationship quality or perceived mastery climate (see Table 15).

Table 13

Means, standard deviations and correlations for the motivational variables.

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	
1	Age	11.82 (2.23)	-									
2	Sex	-	-0.07	-								
3	Level	-	-0.13	0.04	-							
4	PC	6.10 (0.79)	-0.26***	0.07	0.16*	-						
5	Task	4.52 (0.50)	-0.18*	0.18*	0.22**	0.47***	-					
6	Ego	2.98 (1.15)	0.10	0.42***	0.15*	0.27***	0.32***	-				
7	PeerM	5.18 (1.18)	-0.22**	0.08	0.05	0.19*	0.27***	0.16*	-			
8	PeerP	3.28 (1.26)	0.28***	0.34***	0.14	0.05	0.08	0.46***	0.48***	-		
9	COAM	4.14 (0.76)	-0.14	0.01	0.09	0.21**	0.27***	0.09	0.62***	0.35***	-	
10	COAP	1.88 (0.77)	0.11	0.14	0.16*	0.04	0.08	0.34***	0.28***	0.60***	0.40***	-

Note. Level = competitive level (i.e., competitive or recreational); PC = perceived competence; Task = task orientation; Ego = ego orientation; PeerM = peer mastery climate; PeerP = peer performance climate; COAM = coach mastery climate; COAP = coach performance climate.

Table 14

Differences between sources of information for male and female youth athletes.

	Estimate	SE	EST/SE	p-value
Task	-0.18	0.08	-2.27	.023
Ego	-0.92	0.17	-5.40	<.001
PeerP	-0.95	0.19	-5.02	<.001
COAP	-0.28	0.12	-2.30	.022

Note. Task = task orientation; Ego = ego orientation; PeerP = peer performance climate; COAP = coach performance climate.

Recreational players (coded 1) reported significantly lower perceived competence compared to competitive players (coded 0; see Table 17). Task orientation was also lower in recreational players compared to competitive players. Interestingly, there were no significant differences in ego orientation or perceived motivational climates for recreational and competitive players. One unexpected finding was that recreational players reported significantly lower friendship quality compared to competitive players.

Table 15

Differences between sources of information for competitive and recreational athletes.

	Estimate	SE	EST/SE	p-value
PC	-0.25	0.12	-2.06	.040
Task	-0.24	0.09	-2.58	.010
Ego	-0.37	0.19	-1.92	.055
FR	-0.23	0.08	-2.67	.008
COAP	-0.24	0.13	-1.91	.056

Note: PC = perceived competence; Task = task orientation; Ego = ego orientation; FR = friend quality; COAP = coach performance climate.

Unconditional random intercept model. An unconditional random intercept model was analyzed to determine the amount of variability in perceived competence between and within persons, $-2LL = -423.35$. This analysis is typically the first step in conducting multilevel analysis. This analysis produces a point estimate of the grand mean along with confidence intervals (Raudenbush & Bryk, 2002). In this analysis, the grand mean of perceived competence across all youth athlete was 6.09. Average perceived competence was high, considering the IMI scale ranges from 1 to 7.

More importantly, this analysis provides information about the outcome variability at the two levels, between- and within-persons. The σ^2 parameter represents the within-person variability while the τ_{00} parameter represents the between-person variability (Bryk & Raudenbush, 1987; Raudenbush & Bryk, 2002). The intraclass correlation coefficient represents the proportion of variance in the outcome that is between-persons. If the ICC = 0, then there are no between-group differences to produce the dependencies that require multilevel modeling. If the ICC = 1, then all differences in the outcome variable are between-group differences, and individuals within a group have identical scores.

The intraclass correlation in the unconditional model for perceived competence was:

$$= \frac{\tau_{00}}{(\sigma^2 + \tau_{00})} = \frac{0.481}{0.144 + 0.481} = 0.77$$

This means that approximately 77% of the variability in perceived competence can be attributed to between-person differences, while 23% of the variance is within-persons.

Unconditional growth curve model. Since this research study was interested in whether or not there was a linear trajectory in perceived competence across a sports season, an unconditional growth curve model was analyzed. As shown in Table 16, there was not a significant linear trajectory across a sports season. This finding could be due to the time interval

spacings being too short, too few or that perceived competence does not change linearly over time.

Table 16

Parameter estimates for the unconditional growth curve model for perceived competence.

	Estimate (SE)	<i>p</i>
<i>Fixed Effects</i>		
Mean	6.09(0.06)	< .001
Time _{<i>t</i>}	0.003(0.007)	.69
<i>Random Effects</i>		
τ_{00}	0.48(0.08)	< .001
σ^2	0.14(0.01)	< .001

Note: Mean = grand mean of perceived competence; Time_{*t*} = Time 1, Time 2 or Time 3; τ_{00} = between-person variability; σ^2 = within-person variability.

Random-effects multilevel model.

Relationship quality and perceived competence. Relationship quality variables (mom, dad and friend) were added to the unconditional model to understand the relationship between relationship quality and perceived competence across a sports season (see Table 17).

Table 17

Within- and between-person effects of relationship quality variables on perceived competence across a sports season.

	Estimate(SE)	<i>p</i>
<i>Fixed Effects</i>		
Intercept (γ_{00})	3.35(0.74)	< .001
MMom _{<i>i</i>} (γ_{01})	0.01(0.16)	.95
MDad _{<i>i</i>} (γ_{02})	0.27(0.14)	.052
MFR _{<i>i</i>} (γ_{03})	0.29(0.12)	.013
MCare _{<i>i</i>} (γ_{04})	0.15(0.10)	.16
Age _{<i>i</i>} (γ_{05})	-0.08(0.02)	<.001
Sex _{<i>i</i>} (γ_{06})	-0.12(0.10)	.21
Level _{<i>i</i>} (γ_{07})	-0.24(0.10)	.018
Dad _{<i>ti</i>} ^{PMC} (γ_{10})	0.14(0.05)	.005
FR _{<i>ti</i>} ^{PMC} (γ_{20})	-2.63(0.266)	< .001
Care _{<i>ti</i>} ^{PMC} (γ_{30})	-7.16(2.12)	.001
<i>Random Effects</i>		
τ_{00}	0.36(0.06)	< .001
σ^2	0.12(0.01)	< .001

Note: M refers to person-mean; PMC refers to person-mean-centered; Age and Sex were grand-mean-centered; t refers to time-point; *i* refers to person *i*; Mom = mom quality; Dad = dad quality; FR = friend quality; Care = coach quality; Level = competitive level (recreational or competitive); τ_{00} = between-person variability; σ^2 = within-person variability.

Between-person. Parental quality, both mom and dad, was not significantly associated with perceived competence across the sports season. Similarly, the quality of the player/coach relationship was not significantly associated with perceived competence. On average, youth

athletes who reported high levels of friendship quality reported higher levels of perceived competence. There were no differences between males' and females' reported perceived competence. As expected, there was an effect of age; older youth athletes reported lower perceived competence. Additionally, the competitive level was associated with perceived competence; recreational players reported lower perceived competence compared to competitive players.

Within-person. There was little variability in reported relationship quality with mom for youth athletes. Therefore, this variable was not included at the within-person level. The other relationship quality variables, coach, dad and friend, were significantly related to perceived competence across a sports season. Youth athletes who reported higher than average relationship quality with dad reported higher levels of perceived competence. However, youth athletes who reported higher than average levels of coach and friendship relationship quality reported lower levels of perceived competence.

Motivation and perceived competence. Goal orientations (task and ego), and perceived motivational mastery climate (peer and coach) were added to the unconditional model to understand the relationship between motivation and perceived competence across a sports season (see Table 18).

Between-persons. On average, youth athletes who reported high levels of goal orientations, both task and ego, reported higher levels of perceived competence. Perceived climate, both coach and peer, was not associated with perceived competence. There were no differences between males and females in their reported perceived competence. However, there was an effect of age; as expected, older youth athletes reported lower perceived competence.

Table 18

Within- and between-person effects of motivational variables on perceived competence across a sports season.

	Estimate(SE)	<i>p</i>
<i>Fixed Effects</i>		
Intercept (γ_{00})	3.10(0.69)	< .001
MTask _{<i>i</i>} (γ_{01})	0.49(0.16)	.002
MEgo _{<i>i</i>} (γ_{02})	0.12(0.05)	.027
MPeerM _{<i>i</i>} (γ_{03})	-0.03(0.07)	.67
MCOAM _{<i>i</i>} (γ_{04})	0.08(0.10)	.42
Age _{<i>i</i>} (γ_{05})	-0.07(.02)	<.001
Sex _{<i>i</i>} (γ_{06})	0.04(0.11)	.73
Level _{<i>i</i>} (γ_{07})	-0.14(11)	.18
Task _{<i>ti</i>} ^{PMC} (γ_{10})	-0.81(0.34)	.02
Ego _{<i>ti</i>} ^{PMC} (γ_{20})	-0.08(0.03)	.003
PeerM _{<i>ti</i>} ^{PMC} (γ_{30})	-1.01(0.44)	.022
CoachMastery _{<i>ti</i>} ^{PMC} (γ_{40})	-0.001(.06)	.99
<i>Random Effects</i>		
τ_{00}	0.32(0.06)	< .001
σ^2	0.14(.02)	< .001

Note: M refers to person-mean; PMC refers to person-mean-centered; Age and Sex were grand-mean-centered; *t* refers to time-point; *i* refers to person *i*; Task = task orientation; Ego = ego orientation; PeerM = peer mastery climate; COAM = coach mastery climate; Level = competitive level (recreational or competitive); τ_{00} = between-person variability; σ^2 = within-person variability.

The significant relationship between competitive level and perceived competence became non-significant with goal orientations in the model.

Within-persons. Goal orientations, task and ego, were both significantly negatively correlated with perceived competence. Youth athletes who reported higher than average goal orientations reported lower perceived competence. Only peer mastery climate was significantly, and negatively, related to perceived competence. Youth athletes who report higher than average levels of perceived peer mastery climate reported lower levels of perceived competence.

Summary of results. Many of these findings were as expected. Older youth athletes reported lower levels of perceived competence compared to younger youth athletes (Papaioannou, 1997; Weiss & Amorose, 2005). Task and ego orientation were both significantly and positively associated with perceived competence (Lochbaum, Zazo, et al., 2016), as was the finding in the meta-analysis. The correlations between performance motivational climate for both peers and coaches for this sample were not significant.

On average, high levels of parent and coach relationship quality were not predictive of perceived competence, which was not surprising since the research literature is mixed on this relationship. As expected, higher levels of friendship quality, on average, were predictive of perceived competence (A. L. Smith, Ullrich-French, et al., 2006; Ullrich-French & Smith, 2009). Interestingly, higher than average levels of dad relationship quality were predictive of higher levels of perceived competence while higher than average levels of coach and friend relationship quality were predictive of lower perceived competence.

Higher than average goal orientations and perceived peer mastery climate were also predictive of lower perceived competence. These findings were not as expected and differ in

direction from the between level variables. However, there are no other studies which have looked at these relationships from a person-mean centered perspective.

Discussion

This quantitative study aimed to investigate the relationship between perceived competence and sources of information across a sports season (i.e., goal orientations motivational variables and relationship quality). Additionally, this research was interested in understanding the developmental trajectory of perceived competence across a sports season for both recreational and competitive hockey players. It was expected that task orientation and mastery climate, where the focus is on improving skills, mastering the material and learning new things, would be associated with higher perceived competence. On the other hand, a focus on maximizing favorable evaluations of competence, minimizing negative evaluations of their competence and winning, such as ego orientation and performance climate, would result in lower perceived competence. High relationship quality (i.e., high supportive behaviors from parents, coaches and friends) would also be associated with higher perceived competence.

At the outset, a primary goal of this research was to investigate whether or not there was a developmental trajectory for perceived competence across a sports season. It was expected that perceived competence would increase or decrease across a sports season based on the expectation that changes in goal orientations from situational variables create a goal state which might be different from the players' normal goal orientation. Previous research suggests that higher task orientation leads to higher PC while higher ego orientation leads to lower PC (Ryska, 2002).

Previous research done by Ronald E Smith, Smoll, & Cumming (2009), across five weeks of a sports season using multilevel modeling found that performance motivational scores

were associated with significant increases in ego orientation while mastery climate was associated with significant increases in task orientation and decreases in ego orientation. Based on the results of this study, it was expected that six months would be enough time across a sports season to investigate whether perceived competence had a linear trajectory.

The unconditional growth curve model was not significant for a linear trajectory based upon the data collected at three-time points across the sports season for this thesis. Three-time points were selected since they identify a linear trajectory (i.e., there is more data observed information than estimated information) and are thus preferred for at least a sizable portion of the cases (Curran, Obeidat, & Losardo, 2010). As the growth curve model was non-significant, this means that perceived competence did not increase predictably across the three-time points. This finding could be due to three time points not being enough to capture this growth curve, the short interval between time points since the sports season only went from September to March, or there might not be a latent trajectory for the development of perceptions of competence in the sports domain or any other domain. While there was not a significant a linear trajectory across the sports season, there was still significant variability across the season which this research study investigated using the sources of information variables youth athletes utilizes for determining their perceived competence (i.e., motivational and relationship quality variables).

Motivational variables.

Goal orientations. Both task and ego orientation were positively associated with perceived competence. Task orientation was expected to be positively associated with perceived competence. Athletes who report higher task orientations were expected to report higher perceived competence, while athletes who report higher levels of ego orientation were expected to report lower levels of perceived competence (Digelidis & Papaioannou, 2007). The finding of

a positive association is consistent with the results of the current meta-analysis, Lochbaum's and colleagues' meta-analysis (2016) and other research (Rottensteiner et al., 2015). However, the positive relationship between ego orientation and perceived competence is not consistent with the consensus as discussed above in the meta-analysis results. It may be that zero-order correlations do not capture how ego and task orientation may interact to predict perceived competence (i.e., a high task orientation may buffer the potentially negative impact of a high ego orientation). As noted previously, this may be partially responsible for the lack of consistency shown in the literature.

In Study 2, the correlation between task orientation and perceived competence was a large effect size, according to Cohen (1992). It was more than twice the size of the effect size calculated for the current meta-analysis (Study 1). The correlation between ego orientation and perceived competence was also slightly larger than the one found in the current meta-analysis. These differences in effect sizes could be due to the measure used in this thesis, the Achievement Goal Scale for Youth Sports (AGSYS). This measure was different from the two measures used more frequently in the research literature. The AGSYS was selected for this research study, mainly due to the readability level for the younger participants in this research study. The effect size for the relationship between task orientation and perceived competence might be stronger when children can read and understand the written questions which is essential for online questionnaires, as was the case with this research study.

Motivational climate. As expected, both peer and coach mastery climates were positively associated with perceived competence. Athletes who reported higher mastery climates, for peers (Atkins et al., 2014; Jõesaar et al., 2011) and coaches (Ahmadi, Namazizadeh, & Mokhtari, 2012; Kipp & Weiss, 2015), also reported higher perceived competence. However, both peer and

coach performance climates were not significantly related to perceived competence. This finding was unexpected. According to the current meta-analysis, there is a significant small negative relationship between coach performance climate (i.e., a ‘win at all costs’ mentality) and perceived competence. While the current meta-analysis did not include peer performance climate, the research literature suggests that there is a negative relationship with perceived competence (Hwang, Machida, & Choi, 2017; Jõesaar & Hein, 2011; Jõesaar et al., 2011).

A post-hoc moderation analysis using publication year also found that the strength of the relationship between coach performance climate and perceived competence was decreasing over time, suggesting that there might be positive changes over time in coaching behaviors. This decrease in the strength of the relationship between coach performance climate and perceived competence supports the non-significant correlation in this research study. The statistics that were gathered for the meta-analysis do not permit the conclusion that the coaching performance climate declined over time, only that the negative correlation with perceived competence declined over time. However, a recent meta-analysis done by Harwood, Keegan, Smith, and Raine (2015) which reviewed the achievement goal literature from 1990 to 2014 found the association between perceived competence and performance climate, for all social agents, to be non-significant which suggests that coaching behaviors, along with other social agents, may be changing.

These findings might reflect coaching interventions and training requirements that are now a focus in youth sports. The Mastery Approach to Coaching intervention resulted in higher mastery-climate scores and lower performance climate scores when compared with a control condition (R. E. Smith, Smoll, & Cumming, 2007). Another coach training program, Empowering CoachingTM, is based on AGT and Self-Determination Theory (Duda, 2013).

Additionally, most sports associations require some form of training for coaches. However, this is not to say that there are not still at times coaches who promote a performance climate that emphasizes winning at all costs resulting in negative psychological outcomes and sports dropout for some youth athletes.

The non-significant finding for the relationship between peer performance climate and perceived competence might also be due to the decreasing relationship between coach performance climate and perceived competence. There was a strong positive correlation between coach and peer performance climate found in this thesis. While correlation does not imply direction, or causation, both Harter's (1999, 2012) and Nicholls' Theory (1978) suggest that external sources of information influence motivational variables. Peer motivational climates are perceptions of situational motivational cues and behavioral expectations.

Ronald E Smith, Frank L Smoll, and Cumming (2009) found that coaches' motivational climate was predictive of changes to youth athletes' goal orientations across a sports season. This means that youth athletes who perceived a coach created mastery climate had significant increases in their task orientation and significant decreases in their ego orientation. Therefore, the non-significant finding for the relationship between peer performance climate and perceived competence could be the results of more positive coaching behaviors. This means that coaches who have a mastery focus can increase youth athletes task orientation and decrease their ego orientation. The changes in youth athletes goal orientations could then result in changes to peer motivational climate to reflect that of the coach.

Relationship quality. As expected, the correlations between all the relationship variables (i.e., friends, parents, and coaches) were positively associated with perceived competence. The friends and dad variables had a moderate effect size for the relationships with perceived

competence. The mom variable and coach variable both had a small effect size for the relationships with perceived competence, which might explain the non-significant effects when added to the multilevel model discussed below.

Sheridan, Coffee, and Lavallee (2014), in their systematic review of the sports literature, found that coaches were identified as the most frequent provider of social support through providing youth athletes informational, emotional and esteem support. These researchers also found that coach, parent and peer support played a role in shaping youth sports experiences, including motivation, participation in elite sports and sports continuance. Some research findings suggest that when coaches are considered independently, they are an important contributor to the motivational climate. However, when considering the influence of parents and peers on goal orientations and therefore perceived competence, coaches may not be as influential.

Youth athletes, between the ages of 7 to 11, reported qualitative differences in their perceptions of coach, parent and peer motivational climate (Keegan, Harwood, Spray, & Lavallee, 2009). Atkins et al. (2014), found that coach mastery climate was an inconsistent predictor of task orientation, which predicted sports competence. Coach mastery climate was only significantly predictive of task orientation in the exploratory structural model but not the confirmatory model, while parent and peer mastery climate were significant predictors for both models. Finally, O'Rourke, Smith, Smoll, and Cumming (2014) found that parent-initiated motivational climate was a significant predictor of self-esteem, trait-anxiety and autonomous regulation at the end of the sports season over and above coach-initiated motivational climate. These findings could be due to youth athletes spending substantially more time with their parents and friends. Additionally, they suggest that social sources of information should not be considered in isolation.

Researchers typically look at parents as a unit without looking at the influences of mom and dad separately. Jõesaar and Hein (2011) found that athletes who reported higher autonomy support from parents were less likely to drop out of sports. Researchers who have looked at mom and dad separately, report stronger effects for dad, concerning some aspects of sports participation. Brown, Frankel, and Fennell (1989) found that dad and friend support, but not mom, were predictive of sports continuance. Ullrich-French and Smith (2006), found that mom relationship was positively associated with self-determined motivation but not significantly related to perceived competence. One possible explanation for these differences is that moms provide more praise and understanding while dads provide more directive feedback (Bowker et al., 2009; Dorsch, Smith, & Dotterer, 2015; Wuerth, Lee, & Alfermann, 2004). As a result, the relationship with dad may have a stronger impact on perceived sport competence, while the relationship with mom may predict different components of perceived competence. This will be discussed in more detail below concerning the results for the multilevel model.

Demographic variables. Another goal of this research was to investigate differences between recreational and competitive athletes in their perceptions of competence along with the sources of information utilized across a sports season. Most research studies focus either entirely on competitive or recreational players. Additionally, there are not as many studies which look at recreational players in the research literature.

Competitive youth athletes reported significantly higher perceived competence, higher task orientation and higher friendship quality compared to recreational youth athletes. Higher levels of perceived competence for competitive players can be explained by competitive players reporting higher task orientation. Higher task orientation is predictive of higher perceived competence (Rottensteiner et al., 2015).

Kavussanu, White, Jowett, and England (2011) found that with respect to goal orientation, elite and non-elite youth athletes differed solely on task, but not ego orientation. This finding also aligns with research suggesting experts are different from non-experts based on deliberate practice, i.e., spending more time learning and improving necessary skills. This additional time spent practicing might also be the reason that competitive athletes report higher levels of friendship quality compared to recreational youth athletes. Competitive youth athletes spend more time together for on- and off-ice practices, number of games per week, and travelling to tournaments.

The finding that competitive youth players had reported similar levels of ego orientation and perceived performance climate suggests that researchers should not be focusing as much on these motivational variables but rather on task orientation. Rather than looking at task orientation solely as a buffer for high ego orientation, the focus should be on approaches to improve task orientation.

As expected, male youth athletes reported higher levels of ego orientation, peer performance climate and coach performance climate. However, in this thesis, female youth athletes reported lower levels of task orientation, which was an unexpected finding. In the research literature, females report higher task orientation than males (Moreno Murcia et al., 2008). In this study, males and females reported similar levels of coach and peer mastery climate, and there was a similar distribution of athletes across competitive and recreational for males and females. It is possible that a finer gradation of competitive levels and recreational levels might have exposed some explanation for this discrepancy with the literature findings.

Multilevel models. This research study used multilevel models to understand the relationships between sources of information and changes in perceived competence across a sports season. The sources of information that were of interest in this research study were relationship quality (i.e., friends, parents and coaches) and motivational variables (i.e., goal orientations and motivational climate).

Relationship quality and perceived competence. Only friend quality was predictive of perceived competence at the between-persons level. This finding was expected, youth athletes who report high friend quality on average also report high perceived competence (Moran & Weiss, 2006). The other relationship variables (i.e., dad, mom or coach) were not significantly related to perceived competence at the between-persons level. While not expected, this finding was perhaps not that surprising for several reasons. The first reason is that friendships are becoming more important to youth athletes, especially considering the mean age of youth athletes in this research study is approximately 12 years of age (Fitzgerald et al., 2012; A. L. Smith, 2000, 2003).

Additionally, most research studies looking at parental support tend to treat parents as a unit, a single predictor variable (Brustad, 1988; Duda & Hom, 1993; Leff & Hoyle, 1997; Ommundsen, Roberts, Lemyre, & Miller, 2006), asking questions such as “I feel that my parents encourage me to learn new skills.” (Atkins et al., 2014). When parents are considered individually in research studies, only dad tends to be a significant predictor, or they predict different outcomes (Kanters, Bocarro, & Casper, 2008; White, Kavussanu, & Guest, 1998). For example, Davies, Babkes Stellino, Nichols, and Coleman (2016) found in their study that only dads were significant predictors of positive sports behaviors when they emphasized a mastery approach (i.e., the focus is on learning new skills and mastering the material). Neither mom or

coach was significantly predictive of positive sports behaviors. Brown, Frankel, and Fennell (1989) found that dad support, but not mom, and friend support predicted sports continuance. In other studies, parents were not predictors of their child's perceived competence (Green & Chalip, 2018).

Youth athletes consistently reported high relationship quality for mom across the sports season. This meant that the relationship quality for mom did not vary across the sports season and could not be used in the MLM model at the within level. The relationship quality for dad, coach and friend varied across the sports season and was included in the MLM model. As expected, higher than average relationship quality with dad was associated with high perceived competence (Kanters et al., 2008). This finding might not be as straight forward as it seems. Dorsch, Smith, and McDonough (2009) found that dads' self-reports on their relationship with their child were higher for conflict and pressure than moms' self-reports. The researchers also had children report on their perceptions of their relationships with their parents and parents report on their perceptions of the relationship with the other parent and the child. Children's perceptions of their relationships with their dads were more consistent with dads' self-reports than with their moms' perception of this relationship. Therefore, when youth athletes report higher levels of relationship quality with their dad, this probably means that there is less conflict and pressure, which contributes to higher perceived competence. In contrast, at least in the current research, their relationship quality with mom was consistently high and might be more predictive of general overall well-being (i.e. self-esteem, not measured in the current study), as opposed to a domain-specific component, such as sports competence (Cassidy & Conroy, 2006).

However, in the present study, higher than average coach and peer relationship quality was associated with lower perceived competence. These findings might result from the fact that

the differences being tested are not between persons but rather a comparison to the youth athletes' average level of relationship quality. In this case, the youth athlete is reporting that their coach or friend is more supportive than usual. Horn (1985), found in her research study with female youth athletes that the type of feedback provided by the coach was associated with changes in a player's perceived competence over the sports season.

Reinforcement, or praise, without including a technical instruction component was associated with a reduction in perceived competence over time. Praise for a successful, or unsuccessful, task without any other feedback can be perceived as the coach considering the youth athlete to be low in ability. Solomon, Golden, Jr., Ciapponi, and Martin (1998) found in their research study that the type of feedback provided by the coach is based on the coach's expectation of the player's ability. High ability players received more instructional feedback compared to low ability players who received more management feedback. Not only do coaches use different feedback based on their perceptions of players different abilities, but the players are also aware that the feedback provided is different based on the coach's expectations of ability (Buning, 2018). In the present study, although coaching support was not broken down into different types of support, one could speculate that if the players perceived their coach to be more supportive than usual, this could be a signal that the coach did not think they were performing as well as others, leading to lower perceived competence

While there does not appear to be similar research looking at this with friends, it is easy to extend these findings to higher than average friend support. Youth athletes who receive higher than average support from their friend while playing sports can perceive this to mean that they are lower in ability. This finding supports Harter's (1999, 2012) and Nicholls' (1978) theories that children use the feedback from coaches and peers as sources of information regarding their

performance in order to update their perceptions of competence. In this case, somewhat counterintuitively, greater support from both friends and coaches, is perceived as a source of incompetence, as opposed to competence.

Motivational variables and perceived competence. Task orientation and ego orientation were the only motivational variables predictive of perceived competence at the between-persons level. This means youth athletes who reported high levels of task and ego orientation, on average, also reported high levels of perceived competence. Neither peer nor coach mastery climate was predictive at the between level.

However, higher than average levels of peer mastery climate, along with higher than average levels of task and ego orientation, were related to lower perceived competence. Task and ego orientation are considered to be dispositional variables (Bortoli et al., 2009; Ryska & Yin, 1999). This means youth athletes tend to have a stable approach to evaluating their performance. Peer mastery climate is considered a situational variable which would moderate a youth athletes' goal orientation, creating goal involvement states (Cervelló, Santos Rosa, García Calvo, Jiménez, & Iglesias, 2007; Gershgoren, Tenenbaum, Gershgoren, & Eklund, 2011). Based on the current research literature, with a focus on between-person comparisons, it would be expected that increases in goal orientations (Van-Yperen & Duda, 1999) and peer mastery climate (Halliburton & Weiss, 2002; Ommundsen, Roberts, Lemyre, & Miller, 2005) would result in increases in perceived competence.

However, it is possible that an increase in goal orientations higher than average could be interpreted as a source of information suggesting that the youth athlete is low in competence. For both task orientation and perceived mastery climate, an increased focus on skill development can be interpreted as being low in that skill, which would result in lower perceived competence.

Higher than average ego orientation would result in more normative comparisons than usual, which can result in lower perceived competence.

Summary. Results of the present study suggest that perceived competence in youth athletes is sensitive to variations in goal orientations and peer mastery climate. Youth who were high in goal orientation were, on average, high in perceived competence as expected. However, when examined at the within-person level, when goal orientation was higher than average, perceived competence was lower. The same, counterintuitive relationship existed for the peer mastery climate, where increases in mastery climate at the within person-level were also related to lowered perceived competence.

Limitations. There are several limitations to the present study. The focus of this research was on how perceived competence changes over a sports season. It would have been helpful to understand this change if additional variables had been collected, such as performance statistics, that might have assisted in understanding changes in goal orientations, motivational climates and relational variables. The present study can only inform researchers that increases in the sources of information, except for dad quality, appear to result in a decrease in perceived competence.

Another potential limitation to this research study was the wide age range of the youth athletes, from 6 years old to 17 years old. Age was used as a continuous variable in the analyses. Children and adolescents undergo a number of social, emotional and cognitive changes over this time frame. These developmental changes impact on the sources of competence information, goal orientations and perceived competence. The decision to leave this variable as a continuous predictor was based on the potential loss of statistical information should the variable be converted to a categorical predictor (van Walraven & Hart, 2008) and based on AGT where it is expected that perceived competence decreases with increasing age (Nicholls, 1989).

This research study was only six months long, which might not be long enough to model any underlying trajectories of perceived competence. It was however longer than other multilevel models that have been done in the physical or sports domain looking at changes in motivational variables based on AGT. Additionally, the sample size was only 182 youth athletes which might not have had enough power to detect an effect with a planned missing design. There is a reduction in power from the planned missing data approach. Finally, this research is correlational in nature.

Conclusions. Despite these limitations, this study illustrates another method in our statistical toolbox for understanding how youth athletes develop competence in the sports domain, disaggregating between-person and within-person variability. This method allows us to ask questions such as is perceived competence higher when youth athletes report higher than average goal orientations? In this case, the answer is that when youth athletes report higher than average goal orientations, they report lower perceived competence. Higher than average peer mastery climates also resulted in lower perceived competence. An explanation for these somewhat counterintuitive findings might be found in the way that youth interpret feedback from significant others. Consistent with other research, an increase in support from either coaches or peers, might signal, to the youth, a decrease in his/her athletic skill or performance. Likewise, increases in perceived task orientation may also signal to the athlete that their performance had decreased or was deficient in some way. Clearly, this explanation is speculative and more research that includes an examination of between, and within-person variability is definitely called for.

This study contributed to the research literature by identifying that perceived competence seems to be sensitive to changes in youth athletes' sources of information utilized across a sports

season. While many research studies investigate changes in perceptions of competence in the academic domain, there does not appear to be other studies which have investigated changes in perceptions of competence in the sports domain. More research is needed to understand how perceived competence changes across a sports season and over the youth athletes time playing sports since perceived competence is predictive of sports continuance and physical activity.

General Discussion

This research aimed to add to the understanding of the development of perceived competence in the sports domain by conducting both a meta-analysis and a quantitative study. Other research has shown that there is cross-domain generalizability in the factors that youth use in developing their perceptions of competence across domains (Castillo, Duda, Balaguer, & Tomás, 2009; Duda & Nicholls, 1992). Since such a large number of youths participate in sports, it is important to understand the strength, generality and durability of changes to perceived competence across a sports season. Although this study focused on perceived competence in a sport setting, there is substantial research that demonstrates the importance of perceived competence in other domains. Thus, findings in the sport setting have more general applicability to other aspects of youth developmental outcomes.

Results from the two studies highlighted three important themes. First, the meta-analysis found that both ego and task orientation were positively correlated with perceived competence. Secondly, the meta-analysis also found that there was a significant difference between youth athletes from collectivist and individualistic countries with respect to the relationship between ego orientation and perceived competence. Finally, the quantitative study found that perceived competence was sensitive to variability in sources of information.

The meta-analysis demonstrated that although the consensus in the research literature is that ego orientation is negatively associated with perceived competence, the actual effect size is a small positive correlation, roughly the same size as the effect size for the relationship between task orientation and perceived competence. The relationship between ego orientation and perceived competence appears to be stable with increasing age while the relationship between task orientation and perceived competence gets stronger with increasing age. These results suggest that having a higher ego orientation is not necessarily a negative quality, as the statistics show that ego orientation has a very similar association with respect to perceived competence as does task orientation in the youth sports population. The value of a systematic quantitative review of the research literature is that it exposes findings that are missed when engaging solely in a qualitative review of the literature. It should be noted that the meta-analysis only looks at direct correlations between variables. It offers no means to look at more complex models which may better explain the complex interrelationships between goal orientations and perceived competence.

The meta-analysis also found that country, whether collectivist or individualistic, moderated the effect size between ego orientation and perceived competence. Youth athletes from collectivist countries had a stronger positive relationship between ego orientation and perceived competence, with nearly double the effect size of youth athletes from individualistic countries. This finding is important for coaches to understand as sports become more multicultural with changing demographics. Traits that individualistic societies associate with ego orientation may have more beneficial effects in youth from collectivist cultures. Understanding the motivational orientations of the youth on a coach's team may allow them to provide a coaching climate which is better aligned with the needs of the particular team.

The quantitative study in this research adds to the research literature by using a three-form planned missing data design. A planned missing data design reduces participant burden when completing the questionnaires. This allows researchers to collect slightly more data than when using one complete questionnaire. Additionally, since this was a planned missing data approach, the missing data by definition would be considered MCAR, which can be imputed using modern missing data techniques such as multiple imputations or maximum likelihood. Maximum likelihood was used to handle the missing data in this research study. However, one serious limitation to this method was that some of the predictor variables were collected only at one-time point, which is a concern for estimating within-person variability.

Previous multilevel models used in the sports literature with youth athletes were focused on motivational climate and its relationship to changes in goal orientations across time. Papaioannou, Marsh, and Theodorakis (2004) and R. E. Smith, Smoll, and Cumming, (2009) included only two-time points in their research studies with intervals ranging from 5 weeks to 12 weeks. The current study lasted six months with three data points and included periodic assessments of perceived competence and the sources of information variables of interest, which were cited as limitations in the previous studies.

Study 2 showed that perceived competence appears to be sensitive to changes in sources of information, both relationship and motivational variables. Moms were consistent in their support across the sports season with youth athletes reporting high levels of support throughout the season. As there was no variability in the mom support variable, it provided no information to the youth athletes with respect to perceived competence. Dads, on the other hand, were reported by youth athletes to have variability in support across the sports season, and their support provided information to the youth athletes. When Dads were reported to have higher

than average support, youth athletes reported higher perceived competence. Dads generally report more conflict and pressure in their relationships with their offspring (O'Rourke et al., 2014), so higher relationship quality (including less conflict and less pressure) would contribute to higher levels of perceived competence. Based on this research, it would be important for fathers to continue to give accurate feedback, focusing on a mastery-oriented approach where the intent is to improve, rather than winning at all costs.

In contrast to dads, higher than average reported support from coach and peers resulted in lower perceived competence. Coaches and peers normally provide high levels of support. Thus this somewhat counter-intuitive finding may arise from a perception that the additional support is being given in order to buffer youth athletes' feelings of confidence, following worse than average performance. This finding implies that coaches need to be mindful of providing support, but not praising without providing guidance and direction aimed at improving athletes' skills.

In addition to relationship variables, three motivational variables were significantly associated with perceived competence. Higher than average levels of goal orientation, both task and ego, were associated with lower perceived competence, while higher than average peer mastery climate was associated with lower perceived competence. For both task and peer mastery, the finding likely results from a focus on improvement. In many cases, individuals and teams focus on improvement because they perceive that they are doing worse than expected. As a consequence, negative impacts on perceived competence would be expected. Similarly, a higher than average ego orientation may be indicative of a youth athlete engaging in more than average peer comparison as a result of perceived performance – “they are learning this drill, why can't I?” Again, lower perceived competence would be expected.

The results from this study could be used to inform coaches and parents on best practices to encourage continued sports participation and lifelong physical activity. Additionally, perceived competence in one domain impacts on global self-esteem, which can support the development of perceived competence in other domains, supporting cross-domain generalizability from playing sports.

From a practical, real-world application standpoint, one of the most important findings of this study is that unconditional support by coaches and peers is not as beneficial to perceived competence as honest feedback. When players received more support than average (for them individually), their perceived competence was lower. This is attributable to the sense that the support was unearned and that the player had not performed in a way to merit the feedback being given. In this sense, it is as important for coaches to recognize when a player has a bad day, and to seek a constructive means of helping players to improve, rather than simply providing positive feedback that does not address the reality of the moment.

The sample population for this study was very nearly equally split between male and female, and the male/female distribution between competitive athletes and recreational athletes was nearly identical as well. Unfortunately, there were not as many recreational athletes (of either gender) as would have been desired, with roughly a 2/3 competitive, 1/3 recreational split for both male and female genders. The limited number of recreational athletes limits the usefulness of this data set for drawing comparisons between competitive and recreational athletes. Further sampling aimed at increasing the number of recreational athletes would allow for more sensitive analyses of recreational athletes. Practically all of the youth athletes were hockey players which limit the generalizability of this research to other sports. Future research should aim to get youth athletes from a variety of sports.

A somewhat surprising result within this study was the general lack of significant effect of coaches. Coach relationship and coaching climate, mastery or performance, were all found not to be significantly related to youth athletes perceived competence in models that controlled for the effect of peers, on average. Intuitively, this seems implausible as there is widespread acknowledgement of the benefits associated with good coaching and a similar recognition of the potential for adverse effects with poor coaching. With this in mind, it seems likely that the coaches are having an effect, but the simplistic coach -> athlete relationship is not capturing it. Instead, one possibility could be that the coach athlete relationship is more of an indirect one, with coaches impacting athletes through their peers. That is, the coach has a small impact on any individual athlete, but because that impact is spread across the entire team, there is an amplification of the coaches' message as it is taken up by the team. Although this possibility was not assessed in the present study, future research might consider that, in team sports, the coach's impact on athlete perceived competence may be a more indirect one.

In conclusion, the present thesis has explored the effect of various sources of information on youth athletes' perceived competence across a sports season. A meta-analysis was undertaken to determine current understanding of these relationships within published research literature, both for the greater degree of statistical assurance associated with any thorough meta-analysis and as a basis for comparison for the quantitative study undertaken as the second part of this study. Both the meta-analysis and the quantitative study found task and ego orientation to have a positive relationship with perceived competence. The meta-analysis exposed a difference between collectivist and individualistic countries with respect to the effect of ego orientation on perceived competence. In both cases, the effect was still positive, but athletes from collectivist countries exhibited an effect size for ego orientation on perceived competence which was

roughly twice that found for athletes in individualistic countries. The multi-level modeling performed as part of the quantitative study found that youth athletes perceived competence was sensitive to changes, relative to the average, of both relationship quality and motivational variables, across a sports season. These results contribute to the research literature in this area, and the improved understanding of the factors that impact on perceived competence can be exploited to improve sports programs impact on youth athletes' perceived competence.

References

- Ahmadi, M., Namazizadeh, M., & Mokhtari, P. (2012). Perceived motivational climate, basic psychological needs and self determined motivation in youth male athletes. *World Applied Sciences Journal, 16*(9), 1189–1195.
- Alfermann, D., Geisler, G., & Okade, Y. (2013). Goal orientation, evaluative fear, and perceived coach behavior among competitive youth swimmers in Germany and Japan. *Psychology of Sport & Exercise, 14*, 307–315. <https://doi.org/10.1016/j.psychsport.2012.11.005>
- Allen, J., & Howe, B. L. (1998). Player ability, coach feedback, and female adolescent athletes' perceived competence and satisfaction. *Journal of Sport & Exercise Psychology, 20*, 280–299.
- Amorose, A. J. (2002). The influence of reflected appraisals on middle school and high school athletes' self-perceptions of sport competence. *Pediatric Exercise Science, 14*, 377–390. Retrieved from [papers2://publication/uuid/B10FDEEA-81B0-4C7D-ADB2-559A7A3743C8](https://pubmed.ncbi.nlm.nih.gov/12345678/)
- Amorose, A. J. (2003). Reflected appraisals and perceived importance of significant others' appraisals as predictors of college athletes' self-perceptions of competence. *Research Quarterly for Exercise and Sport, 74*(1), 60–70.
- Amorose, A. J., & Smith, P. J. K. (2003). Feedback as a source of physical competence information: Effects of age, experience and type of feedback. *Journal of Sport & Exercise Psychology, 25*, 341–359.
- Amorose, A. J., & Weiss, M. R. (1998). Coaching feedback as a source of information about

perceptions of ability: A developmental examination. *Journal of Sport & Exercise Psychology*, 20, 395–420.

Asghar, E., Wang, X., Linde, K., & Alfermann, D. (2013). Comparisons between Asian and German male adolescent athletes on goal orientation, physical self-concept, and competitive anxiety. *International Journal of Sport and Exercise Psychology*, 11(3), 229–243.

<https://doi.org/10.1080/1612197X.2013.748999>

Atkins, M. R., Johnson, D. M., Force, E. C., & Petrie, T. A. (2014). Peers, parents, and coaches, oh my! The relation of the motivational climate to boys' intention to continue in sport.

Psychology of Sport and Exercise, 16(P3), 170–180.

<https://doi.org/10.1016/j.psychsport.2014.10.008>

Babkes, M. L., & Weiss, M. R. (1999). Parental influence on children's cognitive and affective responses to competitive soccer participation. *Pediatric Exercise Science*, 11, 44–62.

Bailey, R., Cope, E. J., & Pearce, G. (2013). Why do children take part in, and remain involved in sport? A literature review and discussion of implications for sports coaches. *International Journal of Coaching Science*, 7(1), 56–75. Retrieved from

<http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=s3h&AN=85448465&site=eds-live&scope=site&custid=s1123095>

Bardid, F., De Meester, A., Tallir, I., Lenoir, M., & Haerens, L. (2016). Configurations of actual and perceived motor competence among children: Associations with motivation for sports and global self-worth. *Human Movement Science*, 50, 1–9.

<https://doi.org/10.1016/j.humov.2016.09.001>

Bergin, D. A., & Habusta, S. F. (2004). Goal orientations of young male ice hockey players and

their parents. *Journal of Genetic Psychology*, *165*(4), 383–397.

Boixadós, M., Cruz, J., Torregrosa, M., & Valiente, L. (2004). Relationships among motivational climate, satisfaction, perceived ability, and fair play attitudes in young soccer players.

Journal of Applied Sport Psychology, *16*(4), 301–317.

<https://doi.org/10.1080/10413200490517977>

Bortoli, L., Bertollo, M., Comani, S., & Robazza, C. (2011). Competence, achievement goals, motivational climate, and pleasant psychobiosocial states in youth sport. *Journal of Sports Sciences*, *29*(2), 171–180. <https://doi.org/10.1080/02640414.2010.530675>

Bortoli, L., Bertollo, M., & Robazza, C. (2009). *Dispositional goal orientations, motivational climate, and psychobiosocial states in youth sport.*

<https://doi.org/10.1016/j.paid.2009.01.042>

Bortoli, L., Messina, G., Zorba, M., & Robazza, C. (2012). Contextual and individual influences on antisocial behaviour and psychobiosocial states of youth soccer players. *Psychology of Sport and Exercise*, *13*(4), 397–406. <https://doi.org/10.1016/j.psychsport.2012.01.001>

Bowker, A., Boekhoven, B., Nolan, A., Bauhaus, S., Glover, P., Powell, T., & Taylor, S. (2009). Naturalistic observations of spectator behavior at youth hockey games. *The Sport Psychologist*, *23*, 301–316.

Boyd, M. P., & Yin, Z. (1996). Cognitive-affective sources of sport enjoyment in adolescent sport participants. *Adolescence*, *31*(122), 382–395.

Brown, B. A., Frankel, B. G., & Fennell, M. P. (1989). Hugs or shrugs: Parental and peer influence on continuity of involvement in sport by female adolescents. *Sex Roles*, *20*(7–8),

397–412. <https://doi.org/10.1007/BF00287999>

- Brustad, R. J. (1988). Affective outcomes in competitive youth sport: The influence of intrapersonal and socialization factors. *Journal of Sport and Exercise Psychology, 10*(3), 307–321.
- Bryk, A. S., & Raudenbush, S. W. (1987). Application of hierarchical linear models to assessing change. *Psychological Bulletin, 101*(1), 147–158.
- Buning, M. (2018). Examining Differential Coaching Behaviors in Positive Coaches: A Mixed-Methods Perspective Guided by the Expectation Performance Process. *Journal of Amateur Sport, 4*(3), 29–60.
- Cassidy, C. M., & Conroy, D. E. (2006). Children's self-esteem related to school- and sport-specific perceptions of self and others. *Journal of Sport Behaviour, 29*(1), 3–26.
- Castillo, I., Duda, J. L., Balaguer, I., & Tomás, I. (2009). Cross-domain generality of achievement motivation across sport and the classroom: The case of spanish adolescents. *Adolescence, 44*, 569–580.
- Cervelló, E. M., Escartí, A., & Guzmán, J. F. (2007). Youth sport dropout from the achievement goal theory. *Psicothema, 19*(1), 65–71. Retrieved from www.psycothema.com
- Cervelló, E. M., Santos Rosa, F. J., García Calvo, T., Jiménez, R., & Iglesias, D. (2007). Young tennis players' competitive task involvement and performance: The role of goal orientations, contextual motivational climate, and coach-initiated motivational climate. *Journal of Applied Sport Psychology, 19*(3), 304–321.
- <https://doi.org/10.1080/10413200701329134>

- Chang, E. C.-H., Chu, C.-H., Karageorghis, C. I., Wang, C.-C., Tsai, J. H.-C., Wang, Y.-S., & Chang, Y.-K. (2015). Relationship between mode of sport training and general cognitive performance. *Journal of Sport and Health Science*, 1–7.
<https://doi.org/10.1016/j.jshs.2015.07.007>
- Chin, N. S., Khoo, S., & Low, W. Y. (2012). Self-determination and goal orientation in track and field. *Journal of Human Kinetics*, 33(1), 151–161. <https://doi.org/10.2478/v10078-012-0054-0>
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155–159.
- Cooper, H. (2010). *Research synthesis and meta-analysis: A step-by-step approach* (4th ed.). Los Angeles: Sage Publications.
- Cumming, S. P., Smith, R. E., Smoll, F. L., Standage, M., & Grossbard, J. R. (2008). Development and validation of the Achievement Goal Scale for youth sports. *Psychology of Sport and Exercise*, 9(5), 686–703. <https://doi.org/10.1016/j.psychsport.2007.09.003>
- Curran, P. J., Obeidat, K., & Losardo, D. (2010). Twelve Frequently Asked Questions About Growth Curve Modeling. *JOURNAL OF COGNITION AND DEVELOPMENT*, 11(2), 121–136. <https://doi.org/10.1080/15248371003699969>
- Daniels, E., & Leaper, C. (2006). A longitudinal investigation of sport participation, peer acceptance, and self-esteem among adolescent girls and boys. *Sex Roles*, 55(11–12), 875–880. <https://doi.org/10.1007/s11199-006-9138-4>
- Davies, M. J., Babkes Stellino, M., Nichols, B. A., & Coleman, L. M. (2016). Other-initiated motivational climate and youth hockey players' good and poor sport behaviors. *Journal of*

Applied Sport Psychology, 28(1), 78–96. <https://doi.org/10.1080/10413200.2015.1071297>

De Meester, A., Maes, J., Stodden, D., Cardon, G., Goodway, J., Lenoir, M., & Haerens, L.

(2016). Identifying profiles of actual and perceived motor competence among adolescents: associations with motivation, physical activity, and sports participation. *Journal of Sports Sciences*, 34(21). <https://doi.org/10.1080/02640414.2016.1149608>

Deci, E. L., & Ryan, R. M. (2000). The " What " and " Why " of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

https://doi.org/10.1207/S15327965PLI1104_01

DeFreese, J. D., & Smith, A. L. (2014). Athlete social support, negative social interactions and

psychological health across a competitive sport season. *Journal of Sport and Exercise Psychology*, 36(6), 619–630. <https://doi.org/10.1123/jsep.2014-0040>

Digelidis, N., & Papaioannou, A. (2007). Age-group differences in intrinsic motivation, goal orientations and perceptions of athletic competence, physical appearance and motivational climate in Greek physical education. *Scandinavian Journal of Medicine & Science in Sports*, 9(6), 375–380. <https://doi.org/10.1111/j.1600-0838.1999.tb00259.x>

Donaldson, S. J., & Ronan, K. R. (2006). The effects of sports participation on young adolescents' emotional well-being. *Adolescence*, 41(162), 369–389.

Dorsch, T. E., Smith, A. L., & Dotterer, A. M. (2015). Individual, relationship, and context factors associated with parent support and pressure in organized youth sport. *Psychology of Sport and Exercise*, 23, 132–141. <https://doi.org/10.1016/j.psychsport.2015.12.003>

Dorsch, T. E., Smith, A. L., & McDonough, M. H. (2009). Parents' perceptions of child-to-

- parent socialization in organized youth sport. *Journal of Sport and Exercise Psychology*, *31*(4), 444–468. <https://doi.org/10.1123/jsep.31.4.444>
- Duda, J. L. (1987). Toward a developmental theory of children's motivation in sport. *Journal of Sport Psychology*, *9*, 130–145.
- Duda, J. L. (2013). The conceptual and empirical foundations of Empowering Coaching™: Setting the stage for the PAPA project. *International Journal of Sport and Exercise Psychology*, *11*(4), 311–318. <https://doi.org/10.1080/1612197X.2013.839414>
- Duda, J. L., Fox, K. R., Biddle, S. J., & Armstrong, N. (1992). Children's achievement goals and beliefs about success in sport. *British Journal of Educational Psychology*, *62*, 313–323. <https://doi.org/10.1111/j.2044-8279.1992.tb01025.x>
- Duda, J. L., & Hom, H. L. (1993). Interdependencies between the perceived and self-reported goal orientations of young athletes and their parents. *Pediatric Exercise Science*, *5*, 234–241. Retrieved from <https://pdfs.semanticscholar.org/2f9f/a83e06493eb5ba1804cada7965a49a7aa2e9.pdf>
- Duda, J. L., & Nicholls, J. G. (1992). Dimensions of Achievement Motivation in Schoolwork and Sport. *Journal of Educational Psychology*, *84*(3), 290–299. Retrieved from https://s3.amazonaws.com/academia.edu.documents/4950789/1992_Duda__Nicholls__Dimensions_of_Achievement_Motivation_in_Schoolwork_and_Sport.pdf?response-content-disposition=inline%3Bfilename%3DDimensions_of_achievement_motivation_in.pdf&X-Amz-Algorithm=
- Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, *56*, 455–463.

- Eccles, J., Wigfield, A., Harold, R. D., & Blumenfeld, P. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development, 64*(3), 830–847.
- Eime, R. M., Young, J. a, Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for adults: informing development of a conceptual model of health through sport. *The International Journal of Behavioral Nutrition and Physical Activity, 10*(1), 135.
<https://doi.org/10.1186/1479-5868-10-135>
- Engström, L.-M. (2008). Who is physically active? Cultural capital and sports participation from adolescence to middle age—a 38-year follow-up study. *Physical Education & Sport Pedagogy, 13*(4), 319–343. <https://doi.org/10.1080/17408980802400510>
- Feichtinger, P., & Höner, O. (2014). Psychological diagnostics in the talent development program of the German Football Association: Psychometric properties of an Internet-based test battery. *Sportwissenschaft, 44*(4), 203–213. <https://doi.org/10.1007/s12662-014-0341-0>
- Felak, M. T. (2011). *The effects of motivational climate and coaching behaviours on sport commitment in recreational youth sports*. Clemson Universtiy.
- Fitzgerald, A., Fitzgerald, N., & Aherne, C. (2012). Do peers matter? A review of peer and/or friends' influence on physical activity among American adolescents. *Journal of Adolescence, 35*(4), 941–958. <https://doi.org/10.1016/j.adolescence.2012.01.002>
- Fry, M. D., & Gano-Overway, L. A. (2010). Exploring the Contribution of the Caring Climate to the Youth Sport Experience. *Journal of Applied Sport Psychology, 22*, 294–304.
<https://doi.org/10.1080/10413201003776352>

- Fry, M., & Duda, J. L. (1997). A developmental examination of children's understanding of effort and ability in the physical and academic domains. *Research Quarterly for Exercise and Sport*, 68(4), 331–344.
- Furley, P., & Memmert, D. (2011). Studying cognitive adaptations in the field of sport: Broad or narrow transfer? A comment on Allen, Fioratou, and McGeorge (2011). *Perceptual and Motor Skills*, 113(2), 481–488. <https://doi.org/10.2466/05.23.PMS.113.5.481-488>
- Gershgoren, L., Tenenbaum, G., Gershgoren, A., & Eklund, R. C. (2011). The effect of parental feedback on young athletes' perceived motivational climate, goal involvement, goal orientation, and performance. *Psychology of Sport & Exercise*, 12, 481–489. <https://doi.org/10.1016/j.psychsport.2011.05.003>
- Gould, D., Flett, R., & Lauer, L. (2012). The relationship between psychosocial developmental and the sports climate experienced by underserved youth. *Psychology of Sport and Exercise*, 13(1), 80–87. <https://doi.org/10.1016/j.psychsport.2011.07.005>
- Green, B. C., & Chalip, L. (2018). Enduring Involvement in Youth Soccer: The Socialization of Parent and Child. *Journal of Leisure Research*, 29(1), 61–77. <https://doi.org/10.1080/00222216.1997.11949783>
- Halliburton, A., & Weiss, M. (2002). Sources of competence information and perceived motivational climate among adolescent female gymnasts varying in skill level. *Journal of Sport & Exercise Psychology*, 24, 396–419. <https://doi.org/10.1123/jsep.24.4.396>
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York, New York, USA: The Guilford Press.

- Harter, S. (2003). The development of self-representations during childhood and adolescence. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 610–642). New York, New York, USA: The Guilford Press.
- Harter, S. (2006). The self. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child Psychology: Volume 3 social, emotional and personality development* (6th ed., pp. 505–570). Hoboken New Jersey: John Wiley & Sons, Inc.
- Harter, S. (2012a). *Self-perception profile for children: Manual and questionnaires (Grades 3 - 8)*. Retrieved from file:///C:/Documents and Settings/Geraldine/My Documents/Downloads/Self-Perception Profile for Children (1).pdf
- Harter, S. (2012b). *The construction of the self: Developmental and sociocultural foundations* (Second). New York, New York, USA: The Guilford Press.
- Harwood, C. G., Keegan, R. J., Smith, J. M. J., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise, 18*, 9–25.
<https://doi.org/10.1016/j.psychsport.2014.11.005>
- Harwood, C. G., & Knight, C. (2009). Stress in youth sport: A developmental investigation of tennis parents. *Psychology of Sport and Exercise, 10*(4), 447–456.
<https://doi.org/10.1016/j.psychsport.2009.01.005>
- Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, California: Sage Publications.
- Holt, N. L., Tamminen, K. A., Black, D. E., Sehn, Z. L., & Wall, M. P. (2008). Parental

- involvement in competitive youth sport settings. *Psychology of Sport and Exercise*, 9(5), 663–685. <https://doi.org/10.1016/j.psychsport.2007.08.001>
- Horn, T. S. (1985). Coaches' feedback and changes in children's perceptions of their physical competence. *Journal of Educational Psychology*, 77(2), 174–186. <https://doi.org/10.1037/0022-0663.77.2.174>
- Howard, A. L. (2015). Leveraging time-varying covariates to test within-and between-person effects and interactions in the multilevel linear model. *Emerging Adulthood*, 3(6), 400–412. <https://doi.org/10.1177/2167696815592726>
- Hwang, S., Machida, M., & Choi, Y. (2017). The Effect of Peer Interaction on Sport Confidence and Achievement Goal Orientation in Youth Sport. *Social Behavior and Personality*, 45(6), 1007–1018. <https://doi.org/10.2224/sbp.6149>
- Iwasaki, S., & Fry, M. D. (2016). Female adolescent soccer players' perceived motivational climate, goal orientations, and mindful engagement. *Psychology of Sport and Exercise*, 27, 222–231. <https://doi.org/10.1016/j.psychsport.2016.09.002>
- Jackson, B., Gucciardi, D. F., Lonsdale, C., Whipp, P. R., & Dimmock, J. A. (2014). "I think they believe in me": The predictive effects of self-efficacy in sport and physical activity settings. *Journal of Sport & Exercise Psychology*, 36, 486–505. <https://doi.org/10.1123/jsep.2014-0070>
- Janssen, I., & Leblanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *The International Journal of Behavioral Nutrition and Physical Activity*, 7, 40. <https://doi.org/10.1186/1479-5868-7-40>

- Jeffrey-Tosoni, S., & Fraser-Thomas, J. (2015). Parent involvement in Canadian youth hockey: Experiences and perspectives of peewee players. *Journal of Sport Behaviour*, *38*(1), 3–25.
- Jõesaar, H., & Hein, V. (2011). Psychosocial determinants of young athletes' continued participation over time. *Perceptual and Motor Skills*, *113*(1), 51–66.
<https://doi.org/10.2466/05.06.13.PMS.113.4.51-66>
- Jõesaar, H., Hein, V., & Hagger, M. S. (2011). Peer influence on young athletes' need satisfaction, intrinsic motivation and persistence in sport: A 12-month prospective study. *Psychology of Sport and Exercise*, *12*(5), 500–508.
<https://doi.org/10.1016/j.psychsport.2011.04.005>
- Kanters, M. A., Bocarro, J., & Casper, J. (2008). Supported or pressured? An examination of agreement among parent's and children on parent's role in youth sport. *Journal of Sport Behavior*, *31*(1), 64–80.
- Kavussanu, M., White, S. A., Jowett, S., & England, S. (2011). Elite and non-elite male footballers differ in goal orientation and perceptions of parental climate. *International Journal of Sport and Exercise Psychology*, *9*(3), 284–290.
<https://doi.org/10.1080/1612197X.2011.614854>
- Keegan, R. J., Harwood, C. G., Spray, C. M., & Lavalley, D. E. (2009). A qualitative investigation exploring the motivational climate in early career sports participants: Coach, parent and peer influences on sport motivation. *Psychology of Sport and Exercise*, *10*(3), 361–372. <https://doi.org/10.1016/j.psychsport.2008.12.003>
- Kipp, L. E., & Weiss, M. R. (2015). Social predictors of psychological need satisfaction and well-being among female adolescent gymnasts: A longitudinal analysis. *Sport, Exercise and*

Performance Psychology, 4(3), 153–169. <https://doi.org/10.1037/spy0000033>

- Klint, K. a, & Weiss, M. R. (1987). Perceived competence and motives for participating in youth sports: A test of Harter's competence motivation theory. *Journal of Sport Psychology*, 9(1), 55–65. Retrieved from [http://sfx.libis.be/kuleuven?url_ver=Z39.88-2004&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.atitle=PERCEIVED COMPETENCE AND MOTIVES FOR PARTICIPATING IN YOUTH SPORTS - A TEST OF HARTER COMPETENCE MOTIVATION THEORY&rft](http://sfx.libis.be/kuleuven?url_ver=Z39.88-2004&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.atitle=PERCEIVED%20COMPETENCE%20AND%20MOTIVES%20FOR%20PARTICIPATING%20IN%20YOUTH%20SPORTS%20-%20A%20TEST%20OF%20HARTER%20COMPETENCE%20MOTIVATION%20THEORY&rft)
- Lau, P. W. C., Cheung, M. W. L., & Ransdell, L. (2007). Sport identity and sport participation : A cultural comparison between collective and individualistic societies. *International Journal of Sport and Exercise Psychology*, 5, 66–81.
- Le Bars, H., Gernigon, C., & Ninot, G. (2009). Personal and contextual determinants of elite young athletes' persistence or dropping out over time. *Scandinavian Journal of Medicine and Science in Sports*, 19(2), 274–285. <https://doi.org/10.1111/j.1600-0838.2008.00786.x>
- Le Menestrel, S., & Perkins, D. F. (2007). An overview of how sports, out-of school time, and youth well-being can and do intersect. *New Directions for Youth Development*, 115, 13–25. <https://doi.org/10.1002/yd>
- Leff, stephen S., & Hoyle, R. H. (1997). The role of parental performance in youth sport participation and performance. *Adolescence*, 32(125), 233–243.
- Lochbaum, M., Çetinkalp, Z. K., Graham, K.-A., Wright, T., & Zazo, R. (2016). Task and ego goal orientations in competitive sport: A quantitative review of the literature from 1989 to 2016. *Kinesiology*, 48(1), 3–29.

- Lochbaum, M., Kallinen, V., & Konttinen, N. (2018). Task and Ego Goal Orientations across the Youth Sports Experience. *Studia Sportiva, 11*(2), 99–105. Retrieved from <https://journals.muni.cz/studiasportiva/article/viewFile/8769/8192>
- Lochbaum, M., Zazo, R., Cetinkalp, Z. K., Wright, T., Graham, K.-A., & Konttinen, N. (2016). A meta-analytic review of Achievement Goal Orientation correlates in competitive sport: A follow-up To Lochbaum et al. (2016). *Kinesiology, 48*(2), 159–173.
- Maehr, M. L. (2008). Culture and achievement motivation. *International Journal of Psychology, 43*(5), 917–918. <https://doi.org/10.1080/00207590701838162>
- Markland, D., & Hardy, L. (1997). On the factorial and construct validity of the intrinsic motivation inventory : Conceptual and operational concerns. *Research Quarterly for Exercise and Sport, 68*(1), 20–31. <https://doi.org/10.1080/02701367.1997.10608863>
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. American Psychological Association. *Psychological Review, 98*(2), 224.
- Massive Competition in Pursuit of the \$5.7 Billion Canadian Youth Sports Market | SRG. (2014). Retrieved February 16, 2016, from <http://www.srgnet.com/2014/06/10/massive-competition-in-pursuit-of-the-5-7-billion-canadian-youth-sports-market/>
- McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60*(1), 48–58.
- McCarthy, P. J., Jones, M. V., & Clark-Carter, D. (2008). Understanding enjoyment in youth sport: A developmental perspective. *Psychology of Sport and Exercise, 9*(2), 142–156.

<https://doi.org/10.1016/j.psychsport.2007.01.005>

- McCarthy, P. J., & Jones, M. V. (2007). A qualitative study of sport enjoyment in the sampling years. *The Sport Psychologist, 21*, 400–416.
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., ... Group, P.-P. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews, 4*(1), 1–9. <https://doi.org/10.1186/2046-4053-4-1>
- Moran, M. M., & Weiss, M. R. (2006). Peer leadership in sport: Links with friendship, peer acceptance, psychological characteristics, and athletic ability. *Journal of Applied Sport Psychology, 18*(2), 97–113. <https://doi.org/10.1080/10413200600653501>
- Moreno Murcia, J. A., Cervelló Gimeno, E., & González-Cutre Coll, D. (2008). Relationships among goal orientations, motivational climate and flow in adolescent athletes: differences by gender. *The Spanish Journal of Psychology, 11*(1), 181–191. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/18630659>
- Morgan, K., Sproule, J., Mcneill, M., Kingston, K., & Wang, J. (2006). A cross-cultural study of motivational climate in physical education lessons in the UK. *International Journal of Sport Psychology, 37*(4), 299–316.
- Newton, M., Fry, M. D., Watson, D. L., Gano-Overway, L. a, Kim, M., Magyar, M. T., & Guivernau, M. R. (2007). Psychometric properties of the Caring Climate Scale in a physical activity setting. *Revista de Psicología Del Deporte, 16*(1), 67–84. Retrieved from <file:///C:/Users/zar4559/Downloads/22-22-1-PB.pdf>

- Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development, 49*(3), 800–814. <https://doi.org/10.2307/1128250>
- Nicholls, J. G. (1984). Achievement Motivation: Conceptions of Ability, Subjective Experience, Task Choice, and Performance. *Psychological Review, 91*(3), 328–346. Retrieved from [http://gribouts.free.fr/psycho/menace du st%E9r%E9o/nicholls - malleable.pdf](http://gribouts.free.fr/psycho/menace%20du%20st%E9r%E9o/nicholls%20-%20malleable.pdf)
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge: Harvard University Press.
- Ntoumanis, N., & Vazou, S. (2005). Peer motivational climate in youth sport: Measurement development and validation. *Journal of Sport & Exercise Psychology, 27*, 432–455.
- O'Rourke, D. J., Smith, R. E., Smoll, F. L., & Cumming, S. P. (2014). Relations of Parent- and Coach-Initiated Motivational Climates to Young Athletes' Self-Esteem, Performance Anxiety, and Autonomous Motivation: Who Is More Influential? *Journal of Applied Sport Psychology, 26*(4), 395–408. <https://doi.org/10.1080/10413200.2014.907838>
- Ommundsen, Y., & Pedersen, B. H. (1999). The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety A study of young athletes. *Scandinavian Journal of Medicine and Science in Sports, 9*(6), 333–343. <https://doi.org/10.1111/j.1600-0838.1999.tb00254.x>
- Ommundsen, Y., Roberts, G. C., Lemyre, P.-N., & Miller, B. W. (2005). Peer relationships in adolescent competitive soccer: Associations to perceived motivational climate, achievement goals and perfectionism. *Journal of Sports Sciences, 23*(9), 977–989. <https://doi.org/10.1080/02640410500127975>

- Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Miller, B. W. (2006). Parental and coach support or pressure on psychosocial outcomes of pediatric athletes in soccer. *Clinical Journal of Sport Medicine, 16*(6), 522–526.
<https://doi.org/10.1097/01.jsm.0000248845.39498.56>
- Ommundsen, Y., & Vaglum, P. (1997). Competence, perceived importance of competence and drop-out from soccer: a study of young players. *Scandinavian Journal of Medicine and Science in Sports, 7*(6), 373–383. <https://doi.org/10.1111/j.1600-0838.1997.tb00170.x>
- Papaioannou, A. (1997). Perceptions of motivational climate, perceived competence, and motivation of students of varying age and sport experience. *Perceptual and Motor Skills, 85*, 419–430. Retrieved from
<https://journals.sagepub.com/doi/pdf/10.2466/pms.1997.85.2.419>
- Papaioannou, A., Marsh, H. W., & Theodorakis, Y. (2004). A Multilevel Approach to Motivational Climate in Physical Education and Sport Settings: An Individual or a Group Level Construct? *Journal of Sports & Exercise Psychology, 26*, 90–118. Retrieved from
<https://journals.humankinetics.com/doi/pdf/10.1123/jsep.26.1.90>
- Price, M. S., & Weiss, M. R. (2013). Relationships among coach leadership, peer leadership, and adolescent athletes' psychosocial and team outcomes: A test of transformational leadership theory. *Journal of Applied Sport Psychology, 25*(2), 265–279.
<https://doi.org/10.1080/10413200.2012.725703>
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Second). Thousand Oaks: Sage Publications.
- Rottensteiner, C., Tolvanen, A., Laakso, L., & Konttinen, N. (2015). Youth athletes' motivation,

- perceived competence, and persistence in organized team sports. *Journal of Sport Behavior*, 38(4), 432–449.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryska, T. A. (2002). The effects of athletic identity and motivation goals on global competence perceptions of student athletes. *Child Study Journal*, 32(2), 109–129.
- Ryska, T. A., & Yin, Z. (1999). Dispositional and situational goal orientations as discriminators among recreational and competitive league athletes. *The Journal of Social Psychology*, 139(3), 335–340. <https://doi.org/10.1080/00224549909598389>
- Sari, I., Ilic, J., & Ljubojevic, M. (2013). The Comparison of Task and Ego Orientation and General Self-Esteem of Turkish and Montenegrin Young Basketball Players. *Kinesiology*, 45, 203–212.
- Savelsbergh, G. J. P., Kamper, W. J., Rabijs, J., De Koning, J. J., & Schöllhorn, W. (2010). A new method to learn to start in speed skating: A differential learning approach. *International Journal of Sport Psychology*, 41(4), 415–427.
- Saville, P. D., Bray, S. R., Martin Ginis, K. a, Cairney, J., Marinoff-Shupe, D., & Pettit, A. (2014). Sources of self-efficacy and coach/instructor behaviors underlying relation-inferred self-efficacy (RISE) in recreational youth sport. *Journal of Sport & Exercise Psychology*, 36(2), 146–156. <https://doi.org/10.1123/jsep.2013-0144>
- Schwab, K. A., Wells, M. S., & Arthur-Banning, S. (2010). Experiences in youth sports: A

comparison between players' and parents' perspectives. *Journal of Sport Administration & Supervision*, 2(21), 41–51.

Sheridan, D., Coffee, P., & Lavalley, D. (2014). A systematic review of social support in youth sport. *International Review of Sport and Exercise Psychology*, 7(1), 198–228.

<https://doi.org/10.1080/1750984X.2014.931999>

Simpkins, S. D., Vest, A. E., Dawes, N. P., & Neuman, K. I. (2010). Dynamic relations between parents' behaviors and children's motivational beliefs in sports and music. *Parenting: Science and Practice*, 10(2), 97–118. <https://doi.org/10.1080/15295190903212638>

Smith, A. L. (2000). Perceptions of peer relationships and physical activity participation in early adolescence. *Journal of Teaching in Physical Education*, 19, 311–324. Retrieved from c:%5CMy Documents%5CEndnote library%5CRealist Tale%5CFaulkner Primary PE UK.pdf

Smith, A. L. (2003). Peer relationships in physical activity contexts: A road less traveled in youth sport and exercise psychology research. *Psychology of Sport and Exercise*, 4(1), 25–39. [https://doi.org/10.1016/S1469-0292\(02\)00015-8](https://doi.org/10.1016/S1469-0292(02)00015-8)

Smith, A. L., Balaguer, I., & Duda, J. L. (2006). Goal orientation profile differences on perceived motivational climate, perceived peer relationships, and motivation-related responses of youth athletes. *Journal of Sports Sciences*, 24(12), 1315–1327. <https://doi.org/10.1080/02640410500520427>

Smith, A. L., Ullrich-French, S., Walker II, E., & Hurley, K. S. (2006). Peer Relationship Profiles and Motivation in Youth Sport. *Journal of Sport and Exercise Psychology*, 28, 362–382.

- Smith, R. E., Cumming, S. P., & Smoll, F. L. (2008). Development and validation of the Motivational Climate Scale for Youth Sports. *Measurement in Physical Education & Exercise Science, 17*(1), 105–119. <https://doi.org/10.1080/10413200701790558>
- Smith, R. E., Smoll, F. L., & Cumming, S. P. (2007). Effects of a motivational climate intervention for coaches on young athletes' sport performance anxiety. *Journal of Sport & Exercise Psychology, 29*(1), 39–59.
- Smith, R. E., Smoll, F. L., & Cumming, S. P. (2009a). Motivational climate and changes in young athletes' achievement goal orientations. *Motivation and Emotion, 33*(2), 173–183. <https://doi.org/10.1007/s11031-009-9126-4>
- Smith, R. E., Smoll, F. L., & Cumming, S. P. (2009b). Motivational climate and changes in young athletes' achievement goal orientations. *Motivation and Emotion, 33*, 173–183. <https://doi.org/10.1007/s11031-009-9126-4>
- Smith, R. E., Smoll, F. L., & Cumming, S. P. (2009c). Motivational climate and changes in young athletes' achievement goal orientations. *Motivation and Emotion, 33*, 173–183. <https://doi.org/10.1007/s11031-009-9126-4>
- Smith, R. E., Smoll, F. L., Cumming, S. P., & Grossbard, J. R. (2006). Measurement of multidimensional sport performance trait anxiety in children and adults: The Sport Anxiety Scale-2. *Journal of Sport and Exercise Psychology, 28*, 479–501. Retrieved from <http://opus.bath.ac.uk/6385/>
- Solomon, G. B., Golden, Jr., A. J., Ciapponi, T. M., & Martin, A. D. (1998). Coach expectations and differential feedback: Perceptual flexibility revisited. *Journal of Sport Behavior, 21*(3), 298–310.

- Sterne, J. A. C., Sutton, A. J., Ioannidis, J. P. A., Terrin, N., Jones, D. R., Lau, J., ... Higgins, J. P. T. (2011). Recommendations for examining and interpreting funnel plot asymmetry in meta-analyses of randomised controlled trials. *British Medical Journal*, *343*(7818), 302–307. <https://doi.org/10.1136/bmj.d4002>
- Stuntz, C. P., Sayles, J. K., & McDermott, E. L. (n.d.). Same-sex and mixed-sex sports teams: How the social environment relates to sources of social support and perceived competence. *Journal of Sports Behavior*.
- Stuntz, C. P., & Weiss, M. R. (2009). Achievement goal orientations and motivational outcomes in youth sport: The role of social orientations. *Psychology of Sport and Exercise*, *10*(2), 255–262. <https://doi.org/10.1016/j.psychsport.2008.09.001>
- Sutton, A. J. (2009). Publication Bias. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (2nd ed., pp. 435–452). New York, New York, USA: Russell Sage Foundation.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.). New York: Pearson.
- Theeboom, M., De Knop, P., & Weiss, M. R. (1995). Motivational Climate, Psychological Responses, and Motor Skill Development in Children's Sport: A Field-Based Intervention Study. *Journal of Sport and Exercise Psychology*, *17*(3), 294–311. <https://doi.org/10.1123/jsep.17.3.294>
- Triandis, H. C. (2001). Individualism-Collectivism and Personality. *Journal of Personality*, *69*(6), 907–924.

- Ullrich-French, S., & Smith, A. L. (2006). Perceptions of relationships with parents and peers in youth sport: Independent and combined prediction of motivational outcomes. *Psychology of Sport and Exercise, 7*(2), 193–214. <https://doi.org/10.1016/j.psychsport.2005.08.006>
- Ullrich-French, S., & Smith, A. L. (2009). Social and motivational predictors of continued youth sport participation. *Psychology of Sport and Exercise, 10*, 87–95. <https://doi.org/10.1016/j.psychsport.2008.06.007>
- Van-Yperen, N. W., & Duda, J. L. (1999). Goal orientations, beliefs about success, and performance improvement among young elite Dutch soccer players. *Scandinavian Journal of Medicine & Science in Sports, 9*(6), 358–364. <https://doi.org/10.1111/j.1600-0838.1999.tb00257.x>
- van Walraven, C., & Hart, R. G. (2008). Leave 'em alone: Why continuous variables should be analyzed as such. *Neuroepidemiology, 30*, 138–139. Retrieved from <https://pdfs.semanticscholar.org/f514/eb92a62022021a4c934792017baca8345ba6.pdf>
- Vazou, S. (2010). Variations in the perceptions of peer and coach motivational climate. *Research Quarterly for Exercise and Sport, 81*(2), 199–211. <https://doi.org/10.5641/027013610X13088554297279>
- Vazou, S., Ntoumanis, N., & Duda, J. L. (2005). Peer motivational climate in youth sport: A qualitative inquiry. *Psychology of Sport and Exercise, 6*, 497–516. <https://doi.org/10.1016/j.psychsport.2004.03.005>
- Voight, M. R., Callaghan, J. L., & Ryska, T. A. (2000). Relationship between goal orientations, self-confidence and multidimensional trait anxiety among Mexican-American female youth athletes. *Journal of Sport Behavior, 23*(3), 271–288.

- Weiss, M. R. (1993). Children's participation in physical activity: Are we having fun yet? *Pediatric Exercise Science*, (5), 205–209. Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Children's+Participation+in+Physical+Activity:+Are+We+Having+Fun+Yet?#0>
- Weiss, M. R. (2000). Motivating kids in physical activity. In *President's Council on Physical Fitness and Sports Research Digest* (Vol. 3). Washington, DC.
- Weiss, M. R., & Amorose, A. J. (2005). Children's self-perceptions in the physical domain: Between- and within-age variability in level, accuracy, and sources of perceived competence. *Journal of Sport & Exercise Psychology*, 27, 226–244. <https://doi.org/10.1080/02701367.2003.10609065>
- Weiss, M. R., Amorose, A. J., & Wilko, A. M. (2009). Coaching behaviors, motivational climate, and psychosocial outcomes among female adolescent athletes. *Pediatric Exercise Science*, 21, 475–492.
- Weiss, M. R., Ebbeck, V., & Horn, T. S. (1997). Children's self-perceptions and sources of physical competence information: A cluster analysis. *Journal of Sport and Exercise Psychology*, 19(1), 52–70. <https://doi.org/10.1123/jsep.19.1.52>
- Weiss, M. R., Ebbeck, V., Mcauley, E., & Wiese, D. (1990). Self-esteem and causal attributions for children's physical and social competence in sport. *Journal of Sport and Exercise Psychology*, 12, 21–36.
- Weiss, M. R., & Smith, A. L. (1999). Quality of youth sport friendships: Measurement development and validation. *Journal of Sport & Exercise Psychology*, 21, 145–166.

- White, S. A., Kavussanu, M., & Guest, S. M. (1998). Goal Orientations and Perceptions of the Motivational Climate Created by Significant Others. *European Journal of Physical Education, 3*(2), 212–228. <https://doi.org/10.1080/1740898980030209>
- Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R. W., & Davis-Kean, P. A. (2006). Development of Achievement Motivation. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of Child Psychology: Volume 3 Social, Emotional and Personality Development* (Sixth, pp. 933–1002). Hoboken New Jersey: John Wiley & Sons, Inc.
- Wuerth, S., Lee, M. J., & Alfermann, D. (2004). Parental involvement and athletes' career in youth sport. *Psychology of Sport and Exercise, 5*, 21–33. [https://doi.org/10.1016/S1469-0292\(02\)00047-X](https://doi.org/10.1016/S1469-0292(02)00047-X)

Appendix A: Coding Manual for Perceived Sports Competence and Motivational Variables

This review will be relatively broad in scope.

Studies must meet the following criteria:

- 1) Included child and adolescent participants (aged 5 -18);
- 2) Included a sample size of at least 10 participants.
- 3) Included a correlation table or provided access to a correlation table.
- 4) Included all the necessary statistical information to allow for coding.

Studies will be excluded if they:

- 1) Were focused on participants that were a youth in special populations (e.g. young people with ADHD)
- 2) Were an intervention.
- 3) Were for scale development.

Study Identification:

Studies that met the above criteria will be given an identification code. If published or unpublished studies meeting the above eligibility included a partial or complete overlap of subjects, these studies would be considered part of the same project. Projects would be assigned a number (i.e. 49). Each study within a project will be given its number following a decimal point (i.e., 49.1). If there are variables common to more than one study within one project, they will be subject to the rules about ‘multiple indices of a variable.’ Variables that are unique to a study will be coded as usual and given their study number as an identifier. The oldest study will be given a decimal number of .1, the next oldest assigned .2 and so on in successive years.

Study Descriptive Information

For each study, only one Study Identification form will be completed. The Study Identification form will include study identifiers as well as study descriptives statistics. An example of the Study Identification form is provided at the end of this manual. Study Identification and Description forms include:

- ***YEAR.** The year the study was published/completed. If there were multiple studies, the year of the study that provided the most effect sizes will be used;
- ***PUB.** Whether the study is published or unpublished. When there are multiple studies both published and unpublished, it will be coded based on the study from which the primary effect size (or the most effect sizes) was obtained. Journal articles (including in press articles), and book chapters will be considered published sources. Manuscripts (unpublished or submitted), conference presentations, government reports, raw data, and dissertations will be regarded as unpublished. For an article to be coded as published, all the information necessary to code the effect size that was used must be in a published document.
- ***PEER.** Whether the study is peer-reviewed. Includes journal articles and dissertations. Excludes book chapters, manuscripts, conference presentations, government reports. If the effect size is from raw data, but a similar effect size is available in a peer-reviewed document, can code as peer-reviewed. Example: there is published effect size, but the author provides updated or more detailed information.
- ***ADDINFO.** Whether additional information was obtained from the author of the study to code the effect size.

- ***COUNTRY.** The country where the study originated. If more than one country was included in the study, code for all countries. If the country where the study took place is not listed, then select other and write in the name of the country.
- ***FOCUS.** Whether the focus of the study was perceived competence. Code no if the study is examining other factors, such as mastery orientation, self-esteem, global self-worth, and self-determination theory.
- ***SETTING.** Were the participants recruited from a sports team, sports camp, school or sports organization.
- ***COMP.** Whether the participants are competitive or recreational players.
- ***THEORY.** Whether the study was based upon theory, such as achievement goal theory or self-efficacy theory.
- ***DEVELOP.** Did the study have a developmental focus?
- ***GROUPS.** Whether the participants were divided into age groups for comparisons. Code no if the participants were not divided into age groups.
- ***EXPLAIN.** If *GROUPS = 1, whether the researcher included an explanation as to age range listed in the study or to the age groupings. Code no if there is no explanation.
- ***SIMMETHODS.** If *GROUPS = 1, whether the materials/methods are similar for all ages (Measurement invariance). Code no if different measures are used with various age groups. Code yes if the authors mention that different measures have been used, but they measure the same construct.
- ***ACCOM.** If *GROUPS = 1, whether accommodations are made based on developmental age (such as reading scenarios to the youngest age groups if needed). Code no if there is no mention of developmental accommodations.

- ***NUM.** The number of teams, camps or sports programs in the study.
- ***NUMSPORTS.** The number of sports. Record the number of different sports included in this study.
- ***ASSOCYEARS.** The mean number of years participants have participated in the association, team, etc.
- ***LENGTH.** The duration of the time of the study reported in weeks. If the study is reported in months, weeks will be calculated by multiplying the number of months by 4 to provide the approximate number of weeks. If the length of the study is reported in days, the number of days will be divided by 7 to provide the number of weeks. If the duration of the study were in years, the number of years would be divided by 52 to provide the approximate number of weeks.
- ***SEASON.** Time of year of the study. Code the appropriate period for when the study took place if known.
- ***WHENSEASON.** At what point in the sports season was the data collected, beginning, middle or end? Were there multiple time points? Code this information if known.

Sample Information

- ***SAMPLE.** The sample size reported that participated in the study. Also, code the number of males and females that were part of each group. If there were multiple groups or time points, record the appropriate sample size in the appropriate location. For example, the sample size for group 2 at the second time-point would be recorded under Group 2 SAMPLET2.
- ***AGE.** The mean age of the participants in each group or team. If participants are subdivided by age/grade, record the mean for each separate group or team.

- ***RANGE.** The age range for participants in this study. Record the lowest and highest age for the participants.
- ***SPORTS.** What sports did the participants participate in?
- ***YEARS.** The mean number of years participants played sports.

Multiple Effect Sizes with Same Assessment Instrument

If a study reported multiple effect sizes for the same assessment instrument, only one would be coded if the samples overlapped. In these cases, a decision will be made as to which effect size to code. Typically, longer follow-ups are preferable to shorter follow-ups, but only if the sample sizes were comparable. If there was a substantial difference in sample size, then the effect size with the largest sample size will be chosen. If multiple effect sizes were reported, and they came from two or more distinct samples, then an effect size coding sheet will be filled out for each sample.

VARIABLE CODING FORM

Variable Coding

All variables used in this meta-analysis are described below.

Variable Name & Measure

Included at the top of each coding form (available at the end of this manual) is the name of the variable being coded. We will also code the page number and table from which the information came. This information will assist us when comparing variables and effect sizes, to ensure we are coding from the same information, or to discuss which data best fits our definition of the variable (if both coders used different measures to calculate the effect size).

The effect size of interest is the Pearson correlation, r . For studies reporting results in other metrics, (e.g., other effect sizes such as Cohen's d , results of significance tests such as t -tests, and descriptive data such as means and standard deviations) will be transformed to r using standard procedures.

Significant Digits

When calculating the effect sizes, we will include three figures after the decimal point.

COVER SHEET

STUDY NUMBER _____

TITLE _____

AUTHOR(S) _____

YEAR(S) _____

SOURCE (E.G., JOURNAL) _____

No. of sheets/variables coded: _____

Date: _____

Coder: _____

BASIC STUDY DESCRIPTIVES

*STUDY - Identification # _____

*YEAR - date which study was published/released/completed _____

*PUB - material is a published paper _____

0 = no

1 = yes

*PEER – peer review process _____

0 = no

1 = yes

*ADDINFO – was additional information obtained to code effect size? _____

0 = no

1 = yes

*COUNTRY - country where study originated _____

0 = Canada

9 = Wales

1 = U.S.

10 = Sweden

2 = Britain

11 = Austria

3 = France

12 = New Zealand

4 = Netherlands (Holland)

13 = Belgium

5 = Germany

14 = Taiwan

6 = Denmark

15 = Switzerland

7 = Norway

16 = Other (International)

8 = Australia

* FOCUS – Was the focus of the study on perceived competence? _____

0 = no

1 = yes

*SAMPLET1 _____

*SAMPLET1 _____

Total sample size N = _____

Total sample size N = _____

Males N = _____

Males N = _____

Females N = _____

Females N = _____

Not Provided N = _____

Not Provided N = _____

*SAMPLET2:

*SAMPLET2:

Total sample size N = _____

Total sample size N = _____

Males N = _____

Males N = _____

Females N = _____

Females N = _____

Not Provided N = _____

Not Provided N = _____

*SAMPLET3:

*SAMPLET3:

Total sample size N = _____

Total sample size N = _____

Males N = _____

Males N = _____

Females N = _____

Females N = _____

Not Provided N = _____

Not Provided N = _____

*SETTING – where were the participants recruited

0 = Team

1 = Camp

2 = School

3 = Sport organization

*COMP

0 =Recreational Athletes

1 = Competitive Athletes

2 = Not provided

*AGE - mean age of participants in the study _____

*AGERANGE – youngest to oldest ages in the study

*THEORY – Was the study based upon theory (such as achievement goal theory or self-efficacy theory)? _____

0 = no

1 = yes; Theoretical perspective: _____

*DEVELOP – Did the research study have a developmental perspective?

0 = no

1 = yes

*AGEGROUPS - Does the study divide children into different age groups for comparisons?

0 = no

1 = yes

If *AGEGROUPS = 1; *EXPLAINAGE – Do the authors provide an explanation for the age range of participants or the age grouping?

0 = no

1 = yes

If *AGEGROUPS = 1; *SIMMETHODS – Were similar materials or methods used for all participants/ across age groups?

0 = no

1 = yes

If AGEGROUPS = 1; *ACCOM – Were accommodations made for developmental age in for the methods or materials?

0 = no

1 = yes

*NUM – total number of sport teams or camps participating in this study _____

*NUMSPORTS – how many sports were included in the study? _____

*SPORTS – what sport(s) did the participants participate in?

*YEARS – mean number of years participants played sports. _____

*ASSOCYEARS – mean number of years participants have been with team/association _____

*LENGTH – length of study in weeks _____

*MEASURE – Measure used to access perceived competence.

*ITEMS – number of items in the scale _____

*SCALERANGE – number of Likert items _____

*SEASON – when did the study take place?

0 = Summer

1 = Fall

2 = Winter

3 = Spring

*WHENSEASON – at what point in the season was the data collected _____

0 = beginning

1 = middle

2 = end

3 = multiple time points

Variable Coding Form

Study Number: _____

Page# _____ Table/Figure# _____

Mean Perceived Competence _____

Variable	r	Statistics reported

Variable	Measure Used	Reliability

Were any of the variables used in the effect size artificially dichotomized (e.g., median or 1 SD splits to group participants such as being high or low in perceived competence)?

0 = no

1 = yes

Appendix B: Contact Email to Sport Associations

Title: Carleton University Sport Study

My name is Cecilia Jorgenson, and I am a PhD student in the Positive Youth Development (PYD) Lab at Carleton University. I am writing to ask if your organization would be interested in volunteering to participate in some research. Research in the PYD Lab focuses on the different types of activities (particularly sports activities) in which children and adolescents participate, and how this might predict positive developmental outcomes such as self-esteem, body esteem, self-efficacy and leadership ability.

I am particularly interested in how youth develop a sense of sports competence across the (insert name of sport here) season. Competence, or rather perceived competence, represents children and adolescents' confidence that they can accomplish the task at hand. Perceived competence continues to develop across a person's lifetime.

We know from previous research that youth who have higher perceptions of competence are more likely to participate, will attempt more difficult tasks, and are more likely to persist even in the face of failure. In contrast, youth with lower perceived competence see themselves as having less ability, expect failure, and are more likely to drop out of sports.

As part of my PhD research, I will be asking children and adolescents to answer a short survey three times during the (insert name of sport here) season. To be eligible, children and adolescents must be English-speaking, currently playing (insert name of sport here) and between the ages of 8 and 16 years of age. It will take approximately 20 to 30 minutes to complete the survey. Participants in this research study will be entered into a raffle for a team party each time they participate. Participants who participate in all three-time points will be provided with an additional entry in the raffle (for a maximum of 4 entries per participant). Specific details for the winning team will be worked out with the team coaches but will consist of rental of ice/field and food/beverages for team members.

There are no physical risks associated with participating in this study. However, when answering personal, sensitive questions about themselves, some children may experience discomfort. Children who feel distressed or discomfort at any time during the study may choose not to answer a question or withdraw from the study without explanation or penalty.

All participation would be voluntary, participation would not disrupt regular (insert name of sport here) games or practices, and participants would need parental permission to take part in the study. If your organization is interested in participating, we can arrange a time for me to talk to interested teams and players about the study and hand out permission forms for parents to sign and return. Additionally, there is an option for hockey players to participate online. Interested parents can click on the following link to find more information (insert link here).

Once all the data have been analyzed, I can provide you with a summary of the findings which may be informative for future program planning.

If you are interested, please contact me at cecilia.jorgenson@carleton.ca or 613-796-3257.

Research like this is made possible by volunteers like you!

Cecilia Jorgenson
PhD Candidate, Department of Psychology
Carleton University

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633)

Appendix C: Online Invitation

To be posted on (insert name of sport here) **Associations Websites:**

Title: Carleton University Sport Study

We are looking for volunteers to participate in a study to understand youth experiences in (insert name of sport here).

The study takes place at your (insert name of sport here) either before or after practices/games.

This project is about youth sport. The study aims to understand the development of perceived competence across a sports season. You will be asked to complete a short questionnaire three times during the (insert name of sport here) season.

To be eligible, you must be English-speaking, currently playing (insert name of sport here) and between the ages of 8 and 16 years of age. Participants in this research study will be entered into a raffle for a team party each time they participate. Participants who participate in all three-time points will be provided with an additional entry in the raffle (for a maximum of 4 entries per participant). Specific details for the winning team will be worked out with the team coaches but will consist of rental of ice/field and food/beverages for team members.

There are no physical risks associated with participating in this study. However, when answering personal, sensitive questions about themselves, some children may experience discomfort. Children who feel distressed or discomfort at any time during the study may choose not to answer a question or withdraw from the study without explanation or penalty.

The study will take place at your (insert name of sport here) and should not take more than 30 minutes to complete.

If you are interested, please email Cecilia Jorgenson at cecilia.jorgenson@carleton.ca for more details on participating in person or click on the following link to participate online (insert link here).

If you have any ethical concerns about the study, please contact Dr. Andy Adler, Chair, Carleton University Research Ethics Board-B (by phone at 613-520-2600 ext. 4085 or via email at ethics@carleton.ca).

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633).

Appendix D: Recruitment Letter/email to Parents/Guardians

Title: Carleton University Sport Study

Dear Parent and/or Guardian,

My name is Cecilia Jorgenson, and I am completing a PhD in psychology at Carleton University. I am writing to ask for your agreement for your child to take part in a research study. The goal of the research study is to gain a better understanding of the development of perceived competence and life skills through sports participation.

Taking part is voluntary, and you or your child can decide to stop being in the study at any time. If you choose to allow your child to take part, you will also need to give written permission for your child, and they will need to agree to participate, as well.

Data collection will take place at the beginning of the sports season, in the middle of the sports season and again at the end of the sports season. To be eligible, your child must be English-speaking, currently playing (insert name of sport here) and between the ages of 8 and 16 years of age. Your child will be asked to complete a short set of questionnaires. Children will be asked questions about themselves, such as how often they practice and have games, perceptions of their sports competence, perceptions of support from friends, coaches and their parents.

It will take approximately 20 to 30 minutes to complete the survey. Participants in this research study will be entered into a raffle for a team party each time they participate. Participants who participate in all three-time points will be provided with an additional entry in the raffle (for a maximum of 4 entries per participant). Specific details for the winning team will be worked out with the team coaches but will consist of rental of ice/field and food/beverages for team members.

There are no physical risks associated with participating in this study. However, when answering personal, sensitive questions about themselves, some children may experience discomfort. Children who feel distressed or discomfort at any time during the study may choose not to answer a question or withdraw from the study without explanation or penalty.

All the information your child provides will be kept in strict confidence. Only the principal investigators and faculty advisor will have access to data files. The results of the study will address the overall group, and no child will be identified individually. At the end of the study, we will share our results with the participants and with your child's sports association.

All procedures and measures associated with this study will be reviewed and approved by the Carleton Ethics Committee prior to data collection.

If you are willing to allow your child to participate in this study, please sign the attached consent form or click on the following link to participate online (insert link here). If you should have any additional questions, please feel free to contact me

(CeciliaJorgenson@cmail.carleton.ca), or my supervisor (Dr Anne Bowker; anne.bowker@carleton.ca). I would be more than happy to provide you with any additional information.

If you have any ethical concerns about the study, please contact Dr Andy Adler, Chair, Carleton University Research Ethics Board-B (by phone at 613-520-2600 ext. 4085 or via email at ethics@carleton.ca).

Thank you very much for your time and consideration.

Cecilia Jorgenson

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633).

Appendix E: Parental Consent Forms (in person)

Parental Consent

The purpose of this consent form is to ensure that you understand clearly the purpose of the study and the nature of you and your son/daughter's involvement. This consent form should provide you with adequate information so that you may determine whether or not you wish him/her to participate in the current study.

Title: Carleton University Sport Study

Research Personnel

Principal Investigators: Cecilia Jorgenson, PhD Candidate, Carleton University

CeciliaJorgenson@cmail.carleton.ca

Alison Ward, Honours Student, Carleton University

AlisonWard@cmail.carleton.ca

Faculty Sponsor: Dr Anne Bowker, Carleton University

anne.bowker@carleton.ca

Eligibility Requirements: To be eligible, you must be English-speaking, currently playing (insert name of sport here) and between the ages of 8 and 16 years of age.

Purpose of Parental Consent

Because participants are under the age of 18, parental consent must be obtained before any data may be collected.

Purpose of the Study

The purpose of the research study is to gain a better understanding of the development of perceived competence across the (insert name of sport here) season. We know from previous research that youth who have higher perceptions of competence are more likely to participate, will attempt more difficult tasks, and are more likely to persist even in the face of failure. In contrast, youth with lower perceived competence see themselves as having less ability, expect failure, and are more likely to drop out of sports.

Child's Informed Consent

Before collecting any data, children will be asked to provide written consent to participate in this research study. A copy of this informed consent form is attached for your review.

Description of Data Collection

Children and adolescents participating in this study will be asked to complete a collection of self-report questionnaires at three-time-points during the (insert name of sport here) season. Your child will be invited to complete a short set of questionnaires. Children and adolescents will be asked questions about themselves such as how often they practice and have games, perceptions

of their sports competence, perceptions of support from friends, coaches and their parents. It will take approximately 20 to 30 minutes to complete the survey.

Additionally, you would also be contacted at the beginning of next year's (insert name of sport here) season, to let us know whether or not your son/daughter is continuing their (insert name of sport here) participation. Participants in this research study will be entered into a raffle for a team party each time they participate. Participants who participate in all three-time points will be provided with an additional entry in the raffle (for a maximum of 4 entries per participant). Specific details for the winning team will be worked out with the team coaches but will consist of rental of ice/field and food/beverages for team members.

Your child can decide not to participate at any time during the research study. If they should choose to withdraw, they can let a researcher know, or they can write the word stop on the top of their questionnaire and place it in the manila envelope. All data from participants who chose to withdraw will not be used in the study and will immediately be destroyed.

Anonymity/Confidentiality: All responses are treated as confidential, and in no case will responses from individual children or adolescents be identified. Rather, all data will be collected and numbered using a master key. The master key will be kept in a separate locked cabinet away from the questionnaire scores to ensure that personal information is not matched up with responses. Only the principal investigators and faculty advisor will have access to these data files.

This consent form and all other identifying information (i.e., consent forms and master key) will be destroyed after three years following the completion of the study. The anonymous data may be kept indefinitely and used for future research. Only anonymous aggregated data will be utilized in research publications.

The information collected for this project is confidential and protected under the Freedom of Information and Protection of Privacy Act (FIPPA).

Potential Risk and Discomfort

There are no physical risks associated with participating in this study. However, when answering personal, sensitive questions about themselves, some children may experience discomfort. Children who feel distressed or discomfort at any time during the study may choose not to answer a question or withdraw from the study without explanation or penalty.

Name of parent/guardian: _____

Name of child: _____

Permission granted for child to participate in this research study: Yes No

Signature: _____

Date: _____

Can we contact you in the spring to ask if your child is registered again for the next sports season?

Yes No

Email address (please print):

All participants' responses are confidential, so it is not possible to provide information concerning individual children. When the study is complete, a brief summary of the findings will be available to participants. If you would like a summary of the results, please provide your name and email address below.

_____ Yes, I would like to receive a brief summary of the results of this study. Once the study has been completed, a summary of the survey results will be sent to your email address.

Email address (please print):

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633)

Appendix F: Verbal Assent Script

Hi my name is _____ and I am a researcher at Carleton University. I am interested in learning about your experiences playing (insert name of sport here). Your experiences playing (insert name of sport here) can be used to help improve other (insert name of sport here) players' experiences. If you are interested in helping us, by participating in this research study, we will ask you to fill out a short questionnaire at three different times during the (insert name of sport here) season. Each questionnaire should only take 30 minutes to complete. You can skip any questions that you want, and you can decide to stop at any time without any penalties. If you decide to participate, I have a form that you will need to read and sign before you can start. Would you like to participate in this research study?

Appendix F: Informed Consent (Sports Participant in person)

Please complete this form to take part in the study

Name: _____

Please read and sign the form if you wish to participate in the study:

I know I have been asked to be in a research study.

I know I do not have to be in the study.

If I say yes, I will be asked questions about my (insert name of sport here) experiences.

I know I can quit at any time.

I know that saying no will not impact on my playing (insert name of sport here).

I know I can ask any questions about the study at any time.

I know I can skip any questions that I do not want to answer.

I know only the researchers will know what I say in the survey.

I know that my answers will not be shown to anyone, not even my coaches, my parents, or my friends.

Please check the option that applies to you:

I agree to take part in the study

I do not agree to take part in the study

Signature _____

Date _____

Age _____

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633).

Appendix G: Parental Consent Forms (online)

Parental Consent

The purpose of this consent form is to ensure that you understand clearly the purpose of the study and the nature of you and your son/daughter's involvement. This consent form should provide you with adequate information so that you may determine whether or not you wish him/her to participate in the current study.

Title: Carleton University Sport Study

Research Personnel

Principal Investigators: Cecilia Jorgenson, PhD Candidate, Carleton University

CeciliaJorgenson@cmail.carleton.ca

Faculty Sponsor: Dr Anne Bowker, Carleton University

anne.bowker@carleton.ca

Eligibility Requirements: To be eligible, you must be English-speaking, currently playing (insert name of sport here) and between the ages of 8 and 16 years of age.

Purpose of Parental Consent

Because participants are under the age of 18, parental consent must be obtained before any data may be collected.

Purpose of the Study

The purpose of the research study is to gain a better understanding of the development of perceived competence across the (insert name of sport here) season. We know from previous research that youth who have higher perceptions of competence are more likely to participate, will attempt more difficult tasks, and are more likely to persist even in the face of failure. In contrast, youth with lower perceived competence see themselves as having less ability, expect failure, and are more likely to drop out of sports.

Child's Informed Consent

Before collecting any data, children will be asked to provide consent by clicking that they agree to participate in the online research study. A copy of this informed consent form is provided for your review.

Description of Data Collection

Children and adolescents participating in this study will be asked to complete a collection of self-

report questionnaires at three-time-points during the (insert name of sport here) season. If you agree to allow your child to participate, we will send you a link to the survey at three-time points over the (insert sport here) season. Your child will be asked to complete a short set of questionnaires at each time. Children and adolescents will be asked questions about themselves such as how often they practice and have games, perceptions of their sports competence, perceptions of support from friends, coaches and their parents. It will take approximately 20 to 30 minutes to complete the survey.

Additionally, you would also be contacted at the beginning of next year's (insert name of sport here) season, to let us know whether or not your son/daughter is continuing their (insert name of sport here) participation. Participants in this research study will be entered into a raffle for a team party each time they participate. Participants who participate in all three-time points will be provided with an additional entry in the raffle (for a maximum of 4 entries per participant). Specific details for the winning team will be worked out with the team coaches but will consist of rental of ice/field and food/beverages for team members.

Your child can decide not to participate at any time during the research study. If they should choose to withdraw, they can click on the button that says stop. All data from participants who chose to withdraw will not be used in the study and will immediately be destroyed.

Anonymity/Confidentiality: All responses are treated as confidential, and in no case will responses from individual participants be identified. Rather, all data will be collected and numbered to ensure that personal information, kept separate from the online-questionnaire scores, are not matched up with responses. Only the principal investigators and faculty advisor will have access to data files.

We collect data through the software Qualtrics, which uses servers with multiple layers of security to protect the privacy of the data (e.g., encrypted websites and password protected storage). As Qualtrics servers are in the United States, data will be subject to US laws on privacy and data security.

Data Retention and Destruction: Once the project is completed, the research data will be stored in an anonymized format and potentially used in presentations, publications or future research on this same topic.

The information collected for this project is confidential and protected under the Freedom of Information and Protection of Privacy Act (FIPPA).

Potential Risk and Discomfort

There are no physical risks associated with participating in this study. However, when answering personal, sensitive questions about themselves, some children may experience discomfort. Children who feel distressed or discomfort at any time during the study may choose not to answer a question or withdraw from the study without explanation or penalty.

Please click on the “I Agree” button if you would like to grant permission for your child to participate in this research study. If you choose not to let your child participate at this time, please click on the “No Thank-You” button below.

I AGREE

NO THANK-YOU

Name of parent/guardian: _____

Name of child: _____

Please provide your email address so that we can email the link to study:

Can we contact you in the spring to ask if your child is registered again for the next sports season? (Please click on the appropriate button)

Yes No

All participants’ responses are confidential, so it is not possible to provide information concerning individual children. When the study is complete, a brief summary of the findings will be available to participants. If you would like a summary of the results, please click on the button below:

_____ Yes, I would like to receive a brief summary of the results of this study. Once the study has been completed, a summary of the survey results will be sent to your email address.

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633)

Appendix H: Informed Consent (Sports Participant online)

Please complete this form to take part in the study

Name: _____

Please read and sign the form if you wish to participate in the study:

I know I have been asked to be in a research study.

I know I do not have to be in the study.

If I say yes, I will be asked questions about my (insert name of sport here) experiences.

I know I can quit at any time.

I know that saying no will not impact on my playing (insert name of sport here).

I know I can ask any questions about the study at any time.

I know I can skip any questions that I do not want to answer.

I know only the researchers will know what I say in the survey.

I know that my answers will not be shown to anyone, not even my coaches, my parents, or my friends.

Please click the option that applies to you:

I agree to take part in the study

I do not agree to take part in the study

Signature _____

Date _____

Age _____

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633).

Appendix I: Debriefing Form

Principal Investigator: Cecilia Jorgenson, Carleton University

Faculty advisor: Dr Anne Bowker

Thank you for taking the time to participate in this study. Your participation is very much appreciated.

What are we trying to learn in this research?

The purpose of the research study is to gain a better understanding of the development of perceived competence across the (insert name of sport here) season. We know from previous research that youth who have higher perceptions of competence are more likely to participate, will attempt more difficult tasks, and are more likely to persist even in the face of failure. In contrast, youth with lower perceived competence see themselves as having less ability, expect failure, and are more likely to drop out of sports.

Why is this important to scientists or the general public?

This research will help understand how sports impacts on youth development. What we learn from this study can help develop programs designed to reduce youth drop out, build competence and learn life skills.

Suggestions for further research information

If you would like to learn more about the benefits of youth sports, we encourage you to start by reading any of the many articles found on Psychology Today:

<https://www.psychologytoday.com/basics/sport-and-competition>

If you or your child should experience any discomfort or distress following their participation in this research, please feel free to contact Mental Health Crisis Line, 613-722-6914, or Distress Centre of Ottawa and Region, 613-238-3311.

Should you or your child have any questions or concerns regarding the current research, please contact the principal investigator, Cecilia Jorgenson, by email: at CeciliaJorgenson@email.carleton.ca or the supervising faculty advisor, Dr Anne Bowker, by phone: at (613) 520-2600 ext.8218 or by email at anne_bowker@carleton.ca.

If you have any ethical concerns about the study, please contact Dr Andy Adler, Chair, Carleton University Research Ethics Board-B (by phone at 613-520-2600 ext. 4085 or via email at ethics@carleton.ca).

Thank you for your participation in this study!

This research has been cleared by Carleton University Research Ethics Board-B (Clearance # 106633).

Appendix J: Demographics:

1. Age: _____
2. Team Name _____
3. Gender: Male Female Other
4. How many practices do you have each week? _____
5. How many games do you play each week? _____
6. Do you practice off-ice with your team? Yes or No
If yes, how many times each week? _____
7. Do you attend training separate from the rest of your team? For example, have your
parents enrolled you in a goalie school? Yes or No
If yes, how many times each week? _____

Appendix K: Sports Friendship Quality Scale

Directions: Think about a friend who is on your current sports team. Please choose the response that best corresponds to your level of agreement with each of the following statements.

	Not at all true	A little true	Somewhat true	Pretty true	Really true
1. My friend gives me a second chance to perform a skill.	1	2	3	4	5
2. My friend and I praise each other for doing sports well.	1	2	3	4	5
3. After I make mistakes, my friend encourages me.	1	2	3	4	5
4. My friend has confidence in me during sports.	1	2	3	4	5
5. My friend and I can talk about anything.	1	2	3	4	5
6. My friend and I stick up for each other in sports.	1	2	3	4	5
7. My friend looks out for me.	1	2	3	4	5
8. My friend and I tell each other secrets.	1	2	3	4	5
9. My friend and I have common interests.	1	2	3	4	5
10. My friend and I do similar things.	1	2	3	4	5
11. My friend and I have the same values.	1	2	3	4	5

12. My friend and I think the same way.	1	2	3	4	5
13. My friend and I do fun things.	1	2	3	4	5
14. I like to play with my friend.	1	2	3	4	5
15. My friend and I play well together.	1	2	3	4	5
16. My friend and I spend time together.	1	2	3	4	5
17. My friend and I make up easily when we have a fight.	1	2	3	4	5
18. My friend and I try to work things out when we disagree.	1	2	3	4	5
19. When we have an argument, my friend and I talk about how to reach a solution.	1	2	3	4	5
20. My friend and I get mad at each other.	1	2	3	4	5
21. My friend and I fight.	1	2	3	4	5
22. My friend and I have arguments.	1	2	3	4	5

Appendix L: Parent-Child Relationship Quality (Mom)

Directions: Please choose the response that best corresponds to your level of agreement with each of the following statements about this current sports team.

	Not at all true	A little true	Somewhat true	Pretty true	Really true
1. After I make mistakes, my Mom encourages me.	1	2	3	4	5
2. My Mom has confidence in me during sports.	1	2	3	4	5
3. My Mom and I can talk about anything.	1	2	3	4	5
4. My Mom looks out for me.	1	2	3	4	5
5. My Mom and I have common interests.	1	2	3	4	5
6. My Mom and I do similar things.	1	2	3	4	5
7. My Mom and I have the same values.	1	2	3	4	5
8. My Mom and I think the same way.	1	2	3	4	5
9. My Mom and I do fun things.	1	2	3	4	5
10. I like to play with my Mom.	1	2	3	4	5
11. My Mom and I spend time together.	1	2	3	4	5

12. My Mom and I make up easily when we have a fight.	1	2	3	4	5
13. My Mom and I try to work things out when we disagree.	1	2	3	4	5
14. When we have an argument, my Mom and I talk about how to reach a solution.	1	2	3	4	5
15. My Mom and I get mad at each other.	1	2	3	4	5
16. My Mom and I fight.	1	2	3	4	5
17. My Mom and I have arguments.	1	2	3	4	5

Appendix M: Parent-Child Relationship Quality (Dad)

Directions: Please choose the response that best corresponds to your level of agreement with each of the following statements about this current sports team.

	Not at all true	A little true	Somewhat true	Pretty true	Really true
1. After I make mistakes, my Dad encourages me.	1	2	3	4	5
2. My Dad has confidence in me during sports.	1	2	3	4	5
3. My Dad and I can talk about anything.	1	2	3	4	5
4. My Dad looks out for me.	1	2	3	4	5
5. My Dad and I have common interests.	1	2	3	4	5
6. My Dad and I do similar things.	1	2	3	4	5
7. My Dad and I have the same values.	1	2	3	4	5
8. My Dad and I think the same way.	1	2	3	4	5
9. My Dad and I do fun things.	1	2	3	4	5
10. I like to play with my Dad.	1	2	3	4	5
11. My Dad and I spend time together.	1	2	3	4	5

12. My Dad and I make up easily when we have a fight.	1	2	3	4	5
13. My Dad and I try to work things out when we disagree.	1	2	3	4	5
14. When we have an argument, my Dad and I talk about how to reach a solution.	1	2	3	4	5
15. My Dad and I get mad at each other.	1	2	3	4	5
16. My Dad and I fight.	1	2	3	4	5
17. My Dad and I have arguments.	1	2	3	4	5

Appendix N: Caring Climate Scale

Directions: Please choose the response that best corresponds to your level of agreement with each of the following statements about your current sports team.

	Strongly disagree		Not sure		Strongly Agree
1. Players are treated with respect.	1	2	3	4	5
2. The coaches respect players.	1	2	3	4	5
3. The coaches are kind to players.	1	2	3	4	5
4. The coaches care about the players.	1	2	3	4	5
5. Everyone is treated with kindness.	1	2	3	4	5
6. Players feel that they are treated fairly.	1	2	3	4	5
7. The coaches try to help players.	1	2	3	4	5
8. The coaches want to get to know all the players.	1	2	3	4	5
9. Everyone likes the players for who they are.	1	2	3	4	5
10. The coaches listen to players.	1	2	3	4	5
11. The coaches accept players who they are.	1	2	3	4	5
12. Players feel safe.	1	2	3	4	5
13. Players feel comfortable.	1	2	3	4	5
14. Players feel welcomed every day.	1	2	3	4	5

15. The coaches want players to be successful.	1	2	3	4	5
16. Players know everyone will be nice to them.	1	2	3	4	5
17. The coaches disrespect players.	1	2	3	4	5
18. People miss them when players are absent.	1	2	3	4	5
19. Players feel like other teammates care about them.	1	2	3	4	5
20. People make fun of each other.	1	2	3	4	5

Appendix O: Motivational Climate Scale for Youth Sports

Directions: Here are some statements about what your current team is like. Please read each one and **circle the number that is most correct**. If there are more than one coach on your team, the questions are about the coach that you spend most of your time with.

	Not at all true			Somewhat true		Very true
1. Winning games was the most important thing for the coach.	1	2		3	4	5
2. The coach made players feel good when they improved a skill.	1	2		3	4	5
3. The coach spent less time with the players who weren't as good.	1	2		3	4	5
4. The coach encouraged us to learn new skills.	1	2		3	4	5
5. The coach told us which players on the team were the best.	1	2		3	4	5
6. The coach told players to help each other get better.	1	2		3	4	5
7. The coach told us that trying our best was the most important thing.	1	2		3	4	5
8. The coach paid the most attention to the best players.	1	2		3	4	5
9. The coach said that teammates should help each other improve their skills.	1	2		3	4	5

10. Players were taken out of the game if they made a mistake.	1	2	3	4	5
11. The coach said all of us were important to the team's success.	1	2	3	4	5
12. Coach told us to try and be better than our teammates.	1	2	3	4	5

Appendix P: Harter’s Athletic Competence

Instructions: First, decide which of those statements is more like YOU. Then, go to that side of the statement, either on the left or right and choose how true that statement is for you: Really True or Sort of True and check the box on that side of the item. Sometimes the statement that is more like you will be on the left and sometimes it will be on the right. **You will just check ONE of the four boxes for each item** (Do NOT check both sides on a given item).

	Really True	Sort of True				Really True	Sort of True
1.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids do very well at all kinds of sports	BUT	Other kids don’t feel that they are very good when it comes to sports	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids wish they could be better at sports	BUT	Other kids feel they are very good when it comes to sports	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids think they could do well at just about any new sport activity they haven’t tried yet	BUT	Other kids are afraid they might not do well at sports they haven’t ever tried	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids feel that they are better than others their age at sports	BUT	Other kids don’t feel they can play as well	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	In games and sports some kids usually watch instead of play	BUT	Other kids usually play rather than watch	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids don’t do well at new outdoor games		Other kids are good at new games right away	<input type="checkbox"/>	<input type="checkbox"/>

Appendix Q: Perceived Competence (Intrinsic Motivation Inventory)

Directions: Please read the following sentences and think about how it relates to your sports experience on this team and then indicate how true it is for you by circling the corresponding number.

	Totally Disagree		Neutral			Totally Agree	
1. I think I am pretty good at sports.	1	2	3	4	5	6	7
2. I am satisfied with my performance in sports.	1	2	3	4	5	6	7
3. When I have participated in sports for a while, I feel pretty competent.	1	2	3	4	5	6	7
4. I am pretty skilled at sports.	1	2	3	4	5	6	7
5. I cannot play sports well.	1	2	3	4	5	6	7

Appendix R: Harter’s Peer Acceptance

Instructions: First, decide which of those statements is more like YOU. Then, go to that side of the statement, either on the left or right and choose how true that statement is for you: Really True or Sort of True and check the box on that side of the item. Sometimes the statement that is more like you will be on the left and sometimes it will be on the right. **You will just check ONE of the four boxes for each item** (Do NOT check both sides on a given item).

	Really True	Sort of True				Really True	Sort of True
1.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids find it hard to make friends	BUT	Other kids find it pretty easy to make new friends	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a lot of friends	BUT	Other kids don’t have very many friends	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids would like to have a lot more friends	BUT	Other kids have as many friends as they want	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids are always doing things with a lot of kids	BUT	Other kids usually do things by themselves	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids wish that more people their age liked them	BUT	Other kids feel that most people their age do like them	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids are popular with others their age		Other kids are not very popular	<input type="checkbox"/>	<input type="checkbox"/>

Appendix S: Peer Motivational Climate in Youth Sport Questionnaire

Directions: Using the following scale, please select a number from 1 to 7 to indicate your level of agreement with each of the following statements.

On this team, most athletes...	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
1. Help each other improve.	1	2	3	4	5	6	7
2. Encourage each other to outplay their teammates.	1	2	3	4	5	6	7
3. Offer to help their teammates develop new skills.	1	2	3	4	5	6	7
4. Care more about the opinions of the most able teammates.	1	2	3	4	5	6	7
5. Make their teammates feel valued.	1	2	3	4	5	6	7
6. Work together to improve the skills they don't do well.	1	2	3	4	5	6	7
7. Make negative comments that put	1	2	3	4	5	6	7

	their teammates down.							
8.	Try to do better than their teammates.	1	2	3	4	5	6	7
9.	Criticize their teammates when they make mistakes.	1	2	3	4	5	6	7
10.	Teach their teammates new things.	1	2	3	4	5	6	7

Appendix T: Achievement Goal Scale for youth sports

Directions: We want to know what your goals are in sport. Please read each statement and circle the answer that is most correct for you. Remember there are no right or wrong answers.

	Not at all true			Somewhat true		Very true
1. My goal is to learn new skills and get as good as possible.	1	2	3	4	5	
2. The most important thing is to be the best athlete.	1	2	3	4	5	
3. The most important thing is to improve my skills.	1	2	3	4	5	
4. My goal is to improve, so I am better than others.	1	2	3	4	5	
5. I work hard to become the best I can be.	1	2	3	4	5	
6. I want to be better than others at my sport.	1	2	3	4	5	
7. I feel successful when I learn new skills.	1	2	3	4	5	
8. To me, success means being better than others.	1	2	3	4	5	
9. I feel successful when I do my best.	1	2	3	4	5	
10. I want to show that I am better than others.	1	2	3	4	5	
11. My goal is to master the skills in my sport.	1	2	3	4	5	
12. My goal is to be better than others in my sport.	1	2	3	4	5	