# EVALUATING THE USE OF ADULT-ORIENTED COACHING PRACTICES IN MASTERS SPORT

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## Abstract

Qualitative researchers have shown that adult-oriented coaching practices enhance sport experiences for Masters athletes (MAs); however, this has not been quantitatively confirmed. Thus, the purpose of this study was to quantitatively examine the use of adult-oriented coaching practices throughout a season to determine if the practices changed over time, if the practices enhanced the sporting experiences for MAs, and if congruence (similarity between MAs' and coaches' perceptions of how often the practices are used) played a role in the quality of sport experiences for MAs. The findings indicated that adult-oriented coaching practices remain stable over time and foster outcomes that infer a quality Masters sport experience. Congruence was also related to quality sport experience outcomes but did not mediate the relationships between coaching practices and sport experience outcomes. The findings have implications for coaches, athletes, and policymakers involved in competitive adult sport.

## Statement of Contributions

All chapters in this thesis are based on research by Derrik Motz[1], Scott Rathwell[1], Bettina Callary[2], and Bradley W. Young[3] that was conducted at the [1]University of Lethbridge, [2]Cape Breton University, and the [3]University of Ottawa. I, Derrik Motz, was the main contributor to all efforts involved with the research and writing of all materials presented in this thesis. In both studies, I was responsible for reviewing the literature, recruiting participants, analyzing the data, interpreting the results, and writing the content. In the early stages of participant recruitment, Bettina Callary, Matt Hoffmann (post-doctoral fellow at the University of Ottawa), and Chelsea Currie (Masters student at the University of Ottawa) also helped recruit participants.

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To my supervisors, I cannot say enough good words. Scott, this was a new adventure for both of us and who would have guessed that this relationship started at Backstreet after a game of puck. Maybe in another few years, I'll be tired of you! Bettina, even though we are on opposite sides of the country, you have been a role model since I first met you. The insight and support you provided over the past few years have been invaluable, to say the least. I cannot thank both of you enough for everything that you have done and continue to do for me.

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Kathryn, my girlfriend, you have been so supportive of me every step along the way. I do not know what I would have done without you. I am so proud of you and I am proud of us. Love of my life.

To myself,

This thesis may seem insignificant at times but in many ways, it acts as a marker for all of the hard work you have done and the progress you have made in navigating this world. You began not knowing what you wanted to do with your life (and maybe you still don't) – multiple attempts at post-secondary education, multiple jobs, bad decisions, mediocre decisions, and some good decisions here and there too! All of your endeavours, struggles, and achievements have led you here: a place you thought you'd never be. Yet here you are loving every minute. If you're reading this now, cherish all of it. Most importantly, don't stop! Continue carving this path and enjoying this life. If not for you, none of this would have been possible.

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## List of Abbreviations

MAs = Masters athletes

CAR = Coach-Athlete Relationship

BPN = Basic Psychological Needs

SCM = Sport Commitment Model

APM = Andragogy in Practice Model

AOSCS = Adult-Oriented Sport Coaching Survey

CIA = Considering the Individuality of Athletes

FLS = Framing Learning Situations

ICK = Imparting Coaching Knowledge

RPE = Respecting Preferences for Effort, Accountability, and Feedback

CPP = Creating Personalized Programming

ESEM = Exploratory structural equation modelling

MLM = Maximum likelihood estimator

CART-Q = Coach-Athlete Relationship Questionnaire

BNSSS = Basic Needs Satisfaction in Sport Scale

PNTS = Psychological Needs Thwarting Scale

QMSE = Quality Masters Sport Experience

MPCs = Masters player-coaches

TMSI = Team Sport Model of Interdependence

MML = Multidimensional Model of Leadership

## Chapter 1: Review of the Literature

By 2050, it is anticipated that each continent, except Africa, will have over 25% of their populations over the age of 60 years (Bloom & Luca, 2016). Moreover, the over-65 population is expected to grow upwards of 188% globally by 2050, while the over-85 population is expected to increase by approximately 350% (Bloom & Luca, 2016). Coinciding with these ageing population trends has come a demand from middle-aged and older adults seeking to participate in sport throughout their lifespan. Sports that cater to middle-aged and older adult sportspersons, also known as Masters athletes (MAs), are classified as Masters sports. Although the age requirements vary between types of Masters sports, MAs are generally considered to be over the age of 35 (Young, 2011). In addition to age, two additional criteria must be satisfied to be considered a MA. This includes formal registration in Masters sport (e.g., registered with a club/team or in a competitive event) and practicing/training to prepare for recreational to international Masters sporting competitions (Young, 2011).

Over the past several decades, Masters sport has increased rapidly in popularity (Weir et al., 2010). For example, the first World Masters Games, held in Toronto Canada in 1985, hosted 8305 competitors, while the 2021 World Masters Games in Kansai Japan (now postponed until 2022) are expected to exceed over 50,000 MAs, not considering the supporting personnel (World Masters Games, n.d.). To illustrate how popular large-scale Masters events have become, the 2017 World Masters Games had more than twice as many athletes as the 2016 Olympics in Brazil (International Olympic Committee, n.d.; World Masters Games, n.d.).

### What are the Benefits of Participating Masters Sports?

There are numerous physiological benefits associated with participation in Masters sport. Some physiological benefits of Masters sport participation include decreased vulnerability to

viral illness and better sleeping habits (Shephard et al., 1995) and a decreased rate of decline in $VO_{2max}$ (Lepers & Cattagni, 2018; Reaburn & Dascombe, 2008; Valenzuela et al., 2020). MAs have also shown increased preservation of muscle mass and strength (Faulkner et al., 2008; Wroblewski et al., 2011) and additional health benefits (Minuzzi et al., 2017). These physiological benefits may attenuate age-related decline among MAs while also fostering healthy cognitive function and general health (Fien et al., 2017; Shephard et al., 1995).

While many studies have focused on the physiological benefits of Masters sport, fewer have explored the psychosocial benefits (Dionigi et al., 2011; Gayman et al., 2017). For instance, Dionigi et al. (2011) found that athletes' participation in Master sport resulted in MAs embracing challenges (in general or personally), having fun (enjoyment), feeling motivated (e.g., for health benefits, etc.), feeling accomplished (e.g., have a chance to win something), and being more interested in Masters sport. Similarly, Gayman et al. (2017) found that when athletes participate in Masters sport, they have positive perceptions on ageing (e.g., youthful self-images, coping with ageing, forming and maintaining an athlete/exercise identity), improved cognitions (e.g., enhanced cognitive flexibility), emotions (e.g., excitement, enjoyment, challenge, satisfaction, and competence), increased sociability (e.g., reoccurring/new social interactions, friendships, relationships, and enhanced social support), and more adaptive motivations (e.g., health-promoting behaviours, enhanced physiological functions, and enhanced sport skills). These studies demonstrate that MAs have broad perceptions when it comes to the psychosocial benefits they receive from participating in Masters sport. These studies, however, do not identify specific aspects of the sport experience (e.g., coaching, training, support, etc.) which facilitate the psychosocial benefits for MAs.

Taken together, it appears that there are both physiological and psychosocial benefits associated with Masters sport. However, what we do not know is which benefits are most important to MAs, and which benefits make MAs feel like they have had a *quality sport experience*. Thus, researchers need to look at which components of the Masters sport environment can help create the best possible sport experience for adult athletes to ensure that MAs are maximizing the benefits they receive from participation in sport. For this thesis, we will be investigating the role of the coach.

**What is a Quality Sport Experience for Masters Athletes?**

Until recently, there was no agreed-upon definition of what it means to have a *quality sport experience* for MAs. However, based on the collective findings of previous research (Callary et al., 2021), Young, Rathwell, and Callary (2021) have put forth eight distinct hallmarks, which exemplify a quality Masters sport experience (QMSE): meaningful competition, mastery, testing and assessing oneself, quality relationships, fun and fitness, intellectual stimulation, feeling empowered, and feeling validated. *Meaningful competition* acknowledges that MAs have various ways they look at competition (i.e., self-competition, peer comparisons) and that competitions can enrich sport activity (i.e., enhancing training). *Mastery* is MAs' feelings of competence in terms of their goals, development, and effort. *Testing and assessing oneself* describes that MAs wish to be held accountable in terms of their experience and that MAs like to push themselves to learn and refine aspects of sport. *Quality relationships* is that MAs are motivated to search for beneficial social connections and a sense of belongingness. *Fun and fitness* are MAs' desires for enjoyment in a supported program that helps them stay healthy and reinforces their athletic identity. *Intellectual stimulation* explains that MAs have an inherent interest in learning more about their sport and find learning rewarding. *Feeling*

*empowered* is MAs' needs for autonomous decisions, informed by collaborations, in terms of their sports pursuits. *Feeling validated* describes that MAs need to feel that their investments in sport are being reciprocated, legitimized, and valued by the quality of programming they receive (i.e., coaching, training, competition, resources, etc.).

Although these eight hallmarks of a QSME were conceptualized using data from previous literature in the context of Masters sport (e.g., see Callary & Young, 2020; Larson et al., 2020; Rathwell et al., 2015; Young, 2011; Young et al., 2018), they have yet to be formally tested. For this thesis, we attempt to measure outcomes related to five of the eight hallmarks of a QSME outlined by Young et al. (2021). Specifically, we explored how outcomes related to commitment and enjoyment, liking practice and investing in Masters sport because of one's coach, basic need satisfaction and thwarting, and relationships with one's coach offer insight into Young et al.'s (2021) *mastery*, *quality relationships*, *feeling empowered, feeling validated,* and *fun and fitness* hallmarks of a QMSE. Due to the vast theoretical reach of the eight components of a QMSE, we felt measuring all eight components would introduce too many outcome variables given the novelty of a QMSE.

***Commitment & Enjoyment***

Two common ways in which sport researchers have inferred that MAs were sustaining a quality sport experience in the past were whether MAs remained committed to their sport (i.e., sport commitment) and claimed that they liked their sport (i.e., enjoyment). The Sport Commitment Model (SCM; Scanlan et al., 1993) is one of the most widely used models for understanding sport commitment. SCM defines *sport commitment* as one's intentions to continue to participate in sport. Sport commitment is of great importance because it can inform us about the underlying factors or devices (e.g., family, friends, income, social support, coaches) which

help sustain athletes' participation in sport (Scanlan et al., 1993). In the current study, sport commitment will be used to assess whether MAs are *feeling validated*. Specifically, we are assuming that MAs will be more likely to indicate wanting to continue their sport if they feel their time, money, and efforts are being reciprocated, legitimized, and valued based on their coaches' behaviours (Callary et al., 2015).

Over the past few decades, there has been an increase in research on sport commitment within the context of adult sport. For instance, Casper (2007) studied a sample of 537 adult ($M_{age}$ = 46.5) recreational tennis players to determine if relationships existed between athletes' demographic variables (e.g., age, gender, income, skill) and their levels of sport commitment. The results indicated that older tennis players (> 39 years of age) were more committed than their younger counterparts. Additionally, the results explained that the older tennis players had higher levels of personal investment (e.g., spent more time and money) which contributed to their high levels of sport commitment. This study highlights that commitment may be different depending on an athlete's age, but also suggests other factors including the amount of time and money they have contributed, collectively. Thus, researching sport commitment can offer explanations for why or what makes athletes more, or less, committed to their respective sport.

Looking beyond recreational adult sport and into the competitive Masters sport domain, we can begin to understand how MAs' sport commitment is manifested and how it impacts their lifelong participation. For instance, Young and Medic (2011) studied a sample of 424 Master swimmers to determine which underlying psychosocial factors contributed to their sustained sport commitment. The researchers measured MAs' functional (e.g., "I want to") and obligatory commitment (e.g., "I have to") concerning several of the MAs' psychosocial factors including enjoyment, personal investment, involvement opportunities, other priorities (i.e., alternative

involvement opportunities in other activities that take away from sport) and social constraints and support (e.g., from children, spouse, training partners). The results indicated that MAs' investment, social constraints from children, and investment alternatives predicted MAs' functional commitment. On the other hand, MAs' involvement opportunities, other priorities, social constraints from spouses, training partners, and social support from health practitioners, all predicted obligatory commitment.

Santi, Bruton, Pietrantoni, and Mellalieu (2014) conducted a similar study, whereby they explicitly observed a sample of Masters swimmers ($n$ = 523) sport commitment. Specifically, the authors looked at how these swimmers' sport commitment affects their frequency of participation. Functional commitment (e.g., "I want to commit") and obligatory commitment (e.g., "I have to commit") were measured in relation to the support MAs received (from coaches and teammates) and how often they trained (both in a group and individually). Two interesting results arose, the first being that support from coaches and teammates promoted functional commitment behaviours (e.g., "I want to commit to sport"). This is important because it shows the Masters swimmers are committed to swimming because they want to be, not because they *have* to be. While the second interesting finding was that both functional and obligatory commitment predicted the number of team training sessions and individual training sessions, respectively. This means whether Masters swimmers *want* to participate or *have to* participate in sport, their commitment style is associated with increased sport participation. Overall, this study highlights how coaches and teammates can be vital to MAs' health and sport commitment behaviours. Thus, MAs will have a better overall sport experience if they want to be there and are supported by others.

Taken together, these three studies which observed adult athletes showcase the complexities and importance of understanding how and why adults commit to sport. Adult athletes have several psychosocial considerations which can simultaneously, or exclusively, obstruct and promote their intentions of lifelong sport commitment.

Regarding *sport enjoyment,* the SCM defines it as the positive emotions (e.g., pleasure, liking, and fun) that arise from the sport experience. Enjoyment is a valuable indicator of a quality sport experience for two reasons. First, by knowing the levels of an athlete's enjoyment from participating in Masters sport, we can determine what devices (e.g., coaching) may promote or detract from their enjoyment in sport. Second, enjoyment is a strong predictor of prolonged sport commitment (Scanlan et al., 1993). This means that enjoyment can affect how long an athlete remains committed to sport, whereby high levels of enjoyment may prolong a sport experience, and low levels of enjoyment would risk terminating the sport experience (i.e., there is no quality sport experience without the sport experience itself). Thus, enjoyment can play a dualistic role in fostering and prolonging a quality sport experience for adult athletes. For this thesis, we will be measuring MAs' positive affect, liking, and fun derived from sport (Scanlan et al., 1993) to assess the *fun and fitness* hallmark of a QMSE.

In Master sport, enjoyment has been recognized as an extremely important sport participation outcome for MAs. Several qualitative (Addamo et al., 2012; Dionigi, 2002, 2005, 2006b; Grant, 2001; Phoenix & Griffin, 2013; Roper et al., 2003) and quantitative (Hastings et al., 1995; Kolt et al., 2004; Tantrum & Hodge, 1993; Wilson et al., 2004) studies have noted sport enjoyment as being a significant reason for MAs' participation, and continued participation, in sport. For instance, a 79-year-old tennis athlete said that "I enjoy the game and while I've got two good legs and two good arms, I'll keep playing and I'll go to 90" (p. 314;

Dionigi, 2002). In this example, this athlete links his sport enjoyment to health. On the other hand, a 55-year-old tennis player explained she enjoyed sport because of the "great camaraderie against friends" her age (p. 317; Dionigi, 2002). In this case, the MAs' sport enjoyment comes from social interactions with other similar-aged athletes. Together, these two athletes simultaneously highlight the importance of enjoyment in their sport experience, but they also show that the source of enjoyment can be different for each athlete. Overall, enjoyment is important in creating a quality sport experience for MAs. To our best knowledge, however, no research has explicitly examined the coach as a source of sport enjoyment in terms of MAs' sport experiences.

Looking beyond the fact that enjoyment is an important outcome for MAs' quality sport experience, we also know that an athlete's sport enjoyment is connected to their sport commitment. In youth and elite cohorts, sport enjoyment is consistently the strongest predictor for sport commitment (Scanlan et al., 1993). Likewise, in the context of Masters sport, sport enjoyment is one of the top predictors for sport commitment. For example, Young, Piamonte, Grove, and Medic (2011) examined a sample of 190 international level Masters swimmers to determine what psychosocial factors influenced their sport commitment. The authors found that sport enjoyment strongly related ($B = .76$, $p < .05$) to swimmers' desires to stay committed to their sport (i.e., functional commitment). This finding emphasizes how interconnected sport enjoyment and sport commitment may be, but it also highlights how these two outcomes can impact the quality of MAs' sport experience.

In sum, commitment and enjoyment appear to play an important role in the quality of the sport experiences for MAs because they help explain aspects of MAs' motivational and goal profiles, as well as their general feelings about being involved in sport. However, to the best of

our knowledge, there have been no studies to date that have quantitatively linked facilitative actions or behaviours (e.g., coaching practices or behaviours) to MAs' sport commitment or enjoyment. This leads us to ask, who or what is responsible for establishing sport commitment and enjoyment for athletes in the Masters sport environment? Having identified notable gaps in the Masters sport literature, MAs' sport commitment and enjoyment will be two important measures used in this thesis to infer if MAs *feel validated* and are satisfying the *fun and fitness* aspects of a QMSE.

***Liking Practice and Investing in Masters Sport Because of Their Coach***

Another important aspect of a quality sport experience for MAs is *quality relationships*, which encompasses the reciprocal behaviours between MAs and the supporting athletic personnel (e.g., coaches). Smoll, Smith, Curtis, and Hunt (1978) theorized that a coach's behaviours (i.e., coaching practices) are directly related to athletes' sport-based perceptions and subsequent actions. As an example, if a coach explains a drill incoherently and with frustration, the athletes may read into these emotions and perceive the coach as being apathetic and unclear, which can result in less engagement and poorer performances. On the other hand, if a coach explains a drill with enthusiasm, excitement, the athletes will be more likely to be engaged and model their coach's behaviours. Smith and colleagues' model is important because it demonstrates how a coach's behaviours directly influence their athlete's behaviours and attitudes towards sport.

To test their claims, Smith, Smoll, and Curtis (1979) explored a sample of 34 Little League baseball coaches and 325 youth athletes. More specifically they placed 16 coaches in a control group and 18 coaches in an experimental group where they participated in a two-hour training course hosted by the researchers. The coaches in the training course learned how to

increase positive interactions between themselves and their players, while also intending to reduce fear of failure from their players. After the training session, both the trained and control group coaches completed and returned self-assessment surveys to determine how often they engaged in positive interactions with their athletes. The athletes were also interviewed by the research team and asked to assess how often positive interactions existed with their coaches. The researchers observed that youth baseball players that had a trained coach, as opposed to the control coaches, showed higher levels of enjoyment and a greater likelihood to play for their coach in the future. Taken together, these studies show that coach's practices and behaviours influence how much athlete liked baseball and wanted to invest in sport in the future.

To our knowledge, liking and wanting to continue to play sport as a result of one's coach has not been explored in Masters sport. However, we do know that MAs consistently express inherent enjoyment from participating in sport, likely in part leading to sustained sport investment (Dionigi et al., 2011; Hodge et al., 2008; MacLellan et al., 2017; Medic, 2009; Young & Medic, 2011; Young et al., 2011). Currently, we also do not know what specific coaching practices or behaviours positively or negatively affect MAs' liking of and investment in sport. In this thesis, we will borrow concepts from Smith et al. (1979) to measure MAs' liking of and investment in sport as *a result of their coach*. These outcomes will be used to make inferences about the *quality relationships* hallmark of a QMSE, with the assumption being that athletes who have better relationships with their coach will also report liking their sport more and wanting to continue their sport involvement.

### *Basic Psychological Needs*

According to Ryan and Deci (2017), all humans have three basic psychological needs (BPN) that when satisfied result in well-being (e.g., feelings of happiness and satisfaction;

Kahneman et al., 2006), or when thwarted (or frustrated), result in ill-being (e.g., feelings of dissatisfaction and a lack of happiness). According to the Basic Psychological Needs Theory (Ryan & Deci, 2017) autonomy, competence, and relatedness are the three BPN. Autonomy encompasses one's feelings of having a sense of choice and self-control over their actions and behaviours. Competence describes one's feelings of being capable and effective in carrying out a given task. Relatedness involves one's feelings of belongingness (e.g., feeling of being connected to and accepted by others) in the environment in which they are performing a task.

Within a given sporting environment, an athlete's interactions with teammates, opponents, supporting staff, coaches, and others (e.g., family and friends) can dictate the levels of the athlete's BPN satisfaction or thwarting. Satisfying youth athletes' BPN has been positively associated with intrinsic motivation (i.e., enagaging in sport for the pleasure/staisfaction it provides; Hollembeak & Amorose, 2005), well-being (Gagne, 2003), enhanced flow experiences (i.e., balance between one's capabilities in sport and their abilities to meet the demand of the sport; Jackson et al., 1998; Kowal & Fortier, 2000), and increased athlete sport engagement (De Francisco et al., 2018). Conversely, when youth athletes' BPN are thwarted, or frustrated, they are more likely to report overtraining or burnout (Gould, 1993), disordered eating habits (Sundgot-Borgen & Torstveit, 2004), and anxiety and depression (Fraser-Thomas & Côté, 2009; Krane et al., 1997). These BPN outcomes have not been explored to the same degree with samples of MAs. However, because the BPN theory posits that needs satisfaction and frustration exist for all humans across varying contexts, interactions, and time, similar patterns and outcomes from the youth athletics literature are expected to exist in the Masters sport literature.

Because there is only one study to our knowledge that explicitly examined MAs' BPN (e.g., Hoffmann et al., 2019; compared BPN in coached and non-coached MAs), we must make

inferences about MAs' autonomy, competence, and relatedness indirectly. With regards to MAs' autonomy satisfaction, the Masters sport literature offers insight from both the MAs' and coaches' perspectives. For example, from the MAs' perspective, MacLellan and colleagues (2017) compared coaching behaviours between a group of 12 MAs and a group of nine youth athletes who were coached by the same coach. They found MAs desired and were given many opportunities to make self-directed decisions regarding their training and competition, whereas youth athletes were seldom afforded self-directed opportunities. From the coaches' perspective, the MAs were granted more autonomous opportunities because they generally had more experience and knowledge than the youth athletes (likely due to the maturity and life experiences accumulated by the MAs). This study gives us two important points of view on MAs' BPN. First, MAs wish to feel more autonomous in sport, and second, a coach can recognize and understands this, thus diverting more 'free' time for the coach to attend to other MAs (e.g., one-on-one skill development). Overall, this evidence suggests not only is MAs' autonomy satisfaction important for their sport experience. For this thesis, we intend to use measures of autonomy satisfaction and thwarting to help us make inferences about whether MAs are *feeling empowered* in their sport experiences.

It is also evident within the Masters sport literature that MAs use sport to satisfy their need for competence (Tulle, 2008). Specifically, there are two main ways in which MAs can fulfill their need for competence: a) within sport (e.g., competence in sport skills), and b) outside of sport (e.g., competence in general physical fitness). Within sport, MAs satisfy competencies by competing against similarly aged opponents (via competitive age categories; Medic et al., 2007; Medic et al., 2013) and by pursuing personal goals and challenges (Young et al., 2014). Looking outside of sport, MAs use sport to promote general feelings of competence by

increasing their health, physical fitness, and basic physical functioning (Dionigi et al., 2011; Gayman et al., 2017; Young, 2011; Young et al., 2014).

MAs' competence satisfaction has been linked with several positive Masters sport outcomes. For example, Oghene, McGannon, Schinke, Watson, and Quartiroli (2015) collected media representations of two elite and well-known MAs. A specific positive theme from the media was 'unparalleled athleticism', describing MAs as uniquely healthy and fit beyond comparison (to the similar-aged general population). This is an example of a source from outside of sport that helps project MAs' sport competence.

Inside of sport, MAs' sport competencies can also be related to their prior competency development. For example, in a recent study by Larson, McHugh, Young, and Rodgers (2019), they interviewed 20 Masters swimmers about their transition from youth to Masters sport and found that the competencies developed and maintained earlier in life because of swimming (e.g., physical skills, mental skills, time management) were pivotal to their continued participation across their lifespan. Of note, in the abovementioned studies, MAs' competence was not measured according to the definitions proposed by the BPN framework; however, the evidence suggests that competence (in terms of the BPN theory) is critical to MAs' sport experience. In the current study, by measuring competence satisfaction and thwarting, we will be able to make inferences about the *mastery* hallmark of a QMSE for MAs.

The literature has also shown that MAs are consistently seeking relatedness within and outside of sport, simultaneously highlighting the uniqueness of this athletic cohort. For example, in the context of sport, relatedness can be understood as an athletes' feelings of being connected to and accepted by others in the sporting environment. In general, MAs have regularly expressed their need to socialize with like-minded others as part of satisfying a positive sport experience

(Dionigi, 2006a; Dionigi et al., 2011; Heazlewood et al., 2013; Larson et al., 2019; Stevenson, 2002; Walsh et al., 2018). It is important to note, however, that MAs' relatedness extends outside of the competitive sport environment to where MAs fraternize as well (Young et al., 2015). In other words, MAs meet new people and create new friendships/relationships, which extend the MAs' enjoyment beyond the playing field of sport. Based on these findings, we know that satisfying MAs' feelings of relatedness are critical in fostering a positive sporting environment. In the current study, measures of relatedness satisfaction and thwarting will act as another way to assess the *quality relationships* hallmark of a QMSE.

In conclusion, the abovementioned research provides initial support for the utility of BPN as an indicator of a quality sport experience for MAs; however, most of the studies reviewed were qualitative or did not specifically assess MAs' BPN as defined by Ryan and Deci (2017). This study will address this gap by specifically assessing MAs' BPN satisfaction and frustration using the Basic Needs Satisfaction in Sport Scale (BNSSS; Ng et al., 2011) and the Psychological Needs Thwarting Scale (PNTS; Bartholomew et al., 2011), which were developed for sport and are grounded in Ryan and Deci's BPN theory (Ryan & Deci, 2017). Together, these measures will help us gain a deeper understanding of the *feeling empowered, mastery,* and *quality relationships* components of a QMSE.

***Relationship with Coaches***

Another important contribution to a quality sport experience for MAs is the relationships they have with others within the sports environment, especially the relationship they have with their coach. For instance, in Callary, Rathwell, and Young (2015) qualitative study, they found Masters swimmers felt their relationships with their coaches enhanced their self-efficacy, performance, and interest in swimming. Similarly, MAs in a study by Ferrari, Bloom, Gilbert,

and Caron (2016) described important social, health, and performance benefits that resulted from being coached. The MAs also expressed that their relationship with their coach was paramount to their enjoyment and experience as a swimmer, as well as their overall well-being. Together, these studies highlight MAs' relationships with their coach as being meaningful both inside sport (i.e., the sport experience) and outside of sport (e.g., personal friends).

Quantitative studies have also demonstrated that the relationship between MAs and their coaches is crucial to a quality sport experience. For example, coached MAs have been found to have more self-determined motives (Medic et al., 2012), greater autonomy, competence, and relatedness satisfaction (Hoffmann et al., 2019), and report greater social support, sport commitment, and frequency of training (Santi et al., 2014). Overall, these results suggest that when MAs use a coach, they appear to enhance the quality of their sport experience, as well as the quality of their life. Unfortunately, like many other aspects of a quality sport experience for MAs, we understand that the relationship between a MA and their coach is powerful, yet researchers have yet to address specific devices (e.g., coaching practices or behaviours) which drive this quality relationship with their coach.

One model that may be fruitful for measuring the coach-athlete relationship (CAR) in the context of Masters sport is the 3+1Cs model (Jowett, 2007; Jowett & Ntoumanis, 2004), which stipulates that the CAR is determined by measuring their mutual feelings (closeness), thoughts (commitment), and behaviours (complementarity). Closeness is described as the mutual feelings of trust and respect between a coach and an athlete. Commitment involves the coach's and athlete's mutual intentions to maintain and uphold the CAR. Complementarity is concerned with the reciprocal cooperating behaviours between a coach and an athlete. The final component of the 3+1Cs model is co-orientation, which encompasses both the coach's and athlete's

perspectives on the quality of the relationship and entails the perceived level of agreement related to closeness, commitment, and complementarity. Overall, the 3+1Cs model provides researchers with a framework for assessing both the coach's and athlete's perspectives of the CAR in terms of closeness, commitment, and complementarity.

Generally, in younger sports cohorts, an enhanced CAR is related to many positive outcomes such as more self-determined motives (Riley & Smith, 2011), task-orientation (Rottensteiner et al., 2015), harmonious passion (Lafrenière et al., 2008), group-task cohesion (Jowett & Chaundy, 2004; Olympiou et al., 2008; Vierimaa et al., 2018), and collective team efficacy (Hampson & Jowett, 2014). These studies provide evidence that a CAR can benefits athletes; however, these studies follow the same patterns as the previously discussed hallmarks of a QMSE, whereby no specific mechanisms (e.g., coaching behaviours) are identified which can promote a higher quality CAR within adult athletes' sport experiences.

In the Masters sport literature, studying the CAR and the applicability of the 3+1Cs model is still in its infancy. A recent study by Currie (2019) is the only study to our knowledge that explicitly examines the 3+1Cs model in Masters sport. Currie (2019) recruited a women's Masters synchronized skating team and qualitatively explored the three elements of the CAR between MAs and their coach throughout a season. Currie identified that all three aspects of the CAR (closeness, commitment, and complementarity as proposed by Jowett's 3+1Cs model) were apparent in the Masters synchronized skating environment. First, the MAs showed a level of trust and respect with their coach on the ice. Moreover, there were instances in which this closeness between the coach and adult athlete extended beyond sport. These MAs felt their CAR unfolded beyond sport into a meaningful and lasting friendship. Next, the MAs' commitment to the CAR was apparent through their long- and short-term intentions to stay committed to sport and to train

under their current coach. Finally, MAs' complementarity within the CAR was visible largely due to the types of feedback preferences they had, and if the coach fulfilled these preferences. At times, the skaters felt a lack of complementarity due to the coach's time constraints to interact with the team. Currie noted that the coach and the adult athlete have various constraints (e.g., the coach needs time with other adult athletes, as well as for scheduling and programming) that must be negotiated to satisfy complementarity. For example, if a coach has 20 synchronized skaters, it may be difficult to find the time to give one-on-one personalized feedback to each skater for a given drill/technique. Although this study did not quantitatively assess aspects of Jowett's 3+1Cs model, all three of closeness, commitment, and complementarity were readily apparent by observing the interactions between coaches and the Masters synchronized skaters.

Unlike the previously discussed studies, Currie's (2019) study also provided deeper insight into the complexities of the CAR interactions in Masters sport. Beyond singular CARs, Currie (2019) observed a complex network of interrelationships within the team, extending our understanding of the CAR beyond the 3+1Cs model, which they explained in the Masters Team Sport Model of Interdependence (TMSI). The TMSI shows us that coaches must consider how individual CAR dyads (i.e., the relationships between a single coach and a single MA), the coach-group dyad (i.e., the interactions between a coach and the MA group), and the athlete-athlete dyads (i.e., a relationship between a single MA and a single MA) affect the overall group. Currie (2019) explained that these three unique dyads are interrelated, meaning they can affect one another. For example, if a coach gives poor instructions to their athlete group, certain individual athletes may feel negative about the instructions, leading to a poorer quality CAR. On the other hand, poor instructions may not affect other individual athletes. In this example, the coach's instructions influence their relationship with the athlete group (as a whole), but the

coach's instructions may also affect individual CAR dyads. These findings suggest that a coach's actions and behaviours can alter the quality of the CAR in Masters sport in many ways.

As a result of the few studies that explicitly examined the CAR in Masters sport, we must look to supplementary qualitative works to gain indirect inferences about closeness, commitment, and complementarity that complement the 3+1Cs model. For example, Callary et al. (2015) found that MAs and their coaches share mutual feelings of honesty and respect, which aligns with Jowett's (2004) description of closeness. Ferrari et al. (2016) explained that these feelings are present because MAs bring a wealth of maturity, knowledge, and experience to sport, so coaches must respect and consider this during practice and training. MAs also are responsible for respecting the coach as a leader, as well as someone who has expertise and knowledge surrounding sport. In this scenario, coaches and MAs fulfill aspects of closeness by respecting each other's strengths as coaches or adult athletes.

Other studies indirectly highlight the importance of commitment in the CAR. Specifically, commitment is demonstrated by the mutual loyalty, friendliness, and relatability witnessed between MAs and their coach. For example, Callary et al. (2015) found that when MAs perceived their coaches as being committed to their swim program, the MAs would respond with similar intentions. Here, the coach models sport commitment and the MAs follow suit. Another example compared samples of coached and non-coached MAs (Hoffmann et al., 2019). The coached MAs felt more welcome and comfortable in their environment when they have a coach (i.e., showed higher relatability). Taken together, these studies show that coaches can foster relatable and comfortable environments for their MAs, while also simultaneously modelling commitment behaviours. Further, the results demonstrate that the intentions to maintain the CAR come from MAs' feelings of relatedness, as well as the coach's behaviours.

Finally, the importance of complementarity to MAs' sporting experiences is visible in recent Masters sport literature. Notably, MacLellan et al. (2017) examined how a coach, of both youth and Masters swimming, applied adult-specific coaching to each of their athletic cohorts. Specifically, the authors found that the coach catered to the MAs in terms of their wants and needs by listening and responding to the MAs. In other words, the coach is showing co-operating behaviours (i.e., complementarity) based on each athlete's wants and needs. Further, the coach acted as a role model for the MAs in terms of commitment to sport. Specifically, the MAs recognized when their coach displayed commitment to their program and their delivery of practice, and in return, responded with similar levels of commitment to their practice. Together, these examples show how complementarity can be present in the form of a coach appropriately addressing their MAs' coaching wants and needs, but also in the form of a coach modelling behaviours for their MAs. Overall, this study demonstrates notions of complementarity without explicitly involving Jowett's 3+1Cs model and suggests that cooperating behaviours between MAs and their coach can offer an enhanced quality sport experience for both parties.

Based on the literature, it is apparent that the CAR for MAs has the potential to positively influence the sport experience through mutual feelings of trust and respect, intentions, and behaviours. These qualities of the CAR can influence MAs' development within and beyond sport, making the relationship between a MA and a coach an extremely valuable and important tool to enhance MAs' sporting experience. In the current study, we will use data that relates to MAs' closeness, commitment, and complementarity with their coaches as outcomes to assess the *quality relationships* hallmark of a QMSE.

**Coaching Masters Athletes**

After reviewing the literature, it appears there is a notable gap in our understanding as it pertains to understanding explicit devices or mechanisms (e.g., coaching practices), which create and maintain the hallmarks of a quality sport experience. It is crucial to fill this gap in the literature if we want to better create and maintain quality sport experiences for adult athletes. Learning about which actions and behaviours (from coaches and other) help foster and maintain aspects of a quality sport experience would be beneficial for Masters sport and adult sport alike. For this reason, we will now look to an emerging area of research, which has examined coaching MAs. It is here that we can begin to demonstrate how a coach's practice can affect components of a QMSE.

Before delving into how coaching is a potential contributor to a QMSE, we must first understand MAs' complex characteristics and considerations that make them unique. In knowing the unique characteristics that MAs exhibit, we can only then determine what coaching practices work best for adult athletes, and more importantly, what coaching practices maximize the quality of their sport experience.

The unique aspects of a mature athletic cohort may influence how coaches approach their craft. MAs are unlike other 'typical' athletic cohorts. Generally, when looking at a cohort of MAs the athletes can vary greatly in their life experiences inside and outside of sport (Young et al., 2014), age, gender, sport skill levels, sport types (Heazlewood et al., 2013; Medic, 2009; Medic et al., 2009), and life stages (Dionigi, Fraser-Thomas, & Logan, 2012). For instance, when compared to younger cohorts, MAs are more heterogeneous in their makeup, which makes them inherently different to coach than other athletic cohorts. This evidence shows that MAs can vary significantly on skill levels (e.g., beginners or lifelong experts) within the same group. Here, the coach could be teaching a simple skill, leaving the advanced MAs on the wayside. On the other

hand, the coach could want to teach an advanced skill, but the beginner MAs may not have the competencies or experience necessary to learn that skill. Taken together, this evidence suggests that MAs' heterogeneity can complicate coaching and other aspects of the sport experience. Thus, coaches must learn about each of their MAs before coaching the athletes. This way the coach can account for the heterogeneity in the group.

Since MAs can largely vary athlete-to-athlete, group-to-group, and sport-to-sport, we must understand how to consider these heterogenous characteristics when dealing with the athletes. In recognizing the uniqueness of MAs as a cohort, Young et al. (2014) reviewed the sport psychology and Masters sport literature to understand how to approach coaching MAs. The authors provided four considerations for coaching MAs to deal with the heterogeneity that MAs bring to sport (as compared to other athletic cohorts). First, coaches should create involvement opportunities that cater to individual MAs' approaches to competition, challenges and goals, and involvement preferences while promoting health, youthfulness, and travel opportunities. Second, coaches should help MAs maximize their time in sport. Because MAs are from various life stages, they often have obligations outside of sport that detract from the time they can participate. For this reason, coaches should incorporate structured programming for the MAs to maximize their time on sport (e.g., creating routines, scheduling on-site practices/training, planning training/competition based on competition cycles, and incorporating tools such as social media and videos). Third, coaches should adapt their practices to help MAs with strategies to combat age-related decline. MAs vary in ages and competition levels, so it is important to find the 'sweet spot' for each athlete. For example, coaches can teach their MAs to use age-graded tables to create season-oriented goals rather than lifetime bests, focusing training on five-year cycles to keep MAs motivated within their age-based competition groups (e.g., 45-50, 51-55,

etc.). Finally, coaches should create autonomous and engaging sporting environments for their MAs by offering choice, considering their MAs' input, allowing MAs to identify their own goals, and encouraging self-direction and self-discovery within practice/training. In sum, these four considerations cater to the heterogeneity and complexities of coaching MAs. The four considerations offered coaches literature-based suggestions on how to coach their adult athletes more effectively, in turn creating a higher quality sport experience for their MAs.

To test Young and colleague's (2014) considerations for coaching MAs, researchers (Young et al., 2020) searched for an adult sport coaching model that took these considerations into mind, but most importantly, focused on coaching practices that were specific for adult athletes. Due to a lack of adult sport coaching resources (Callary et al., 2018), however, Young, Rathwell, and Callary (2020) tried borrowing a model from adult education (e.g., the Instructional Perspectives Inventory; Henschke, 1994). Upon vetting the model with 12 Masters coaches, Young et al. (2020) and testing its utility with larger samples of coaches and MAs, they concluded that the Instructional Perspectives Inventory was not applicable for teaching adult athletes. This study showed that there may be parallels between adult sport and adult education; however, simply borrowing a model directly from adult education was not the solution. Instead, Young et al. (2020) suggested that future studies should create a model that was informed by adult learning theories and needed to be: a) easy to understand; b) accurate in representing and measuring its concepts; and c) would help explain how adult athletes are coached.

In a parallel research stream, MacLellan, Callary, and Young (2019) looked deeper into the adult education literature and identified an adult education framework that helped explain why adults preferred and needed different types of learning. This model, the Andragogy in Practice Model (APM; Knowles et al., 2012), is an education model formed around the concept

of andragogy (i.e., the arts and science of adult learning). In Knowles' model, there are six underlying adult learning principles: a) *the learners' need to know*, b) *self-concept of the learner*, c) *prior experiences of the learner*, d) *readiness to learn*, e) *orientation to learning*, and f) *motivation to learn*. *Need to know* emphasizes that adults need to know why they are learning something before they learn it. The *self-concept of the learner* refers to the adults' responsibility of making their own choices. The *prior experience of the learner* describes that adults approach learning with much more accumulated experiences as compared to youth, and a different quality of experience. *Readiness to learn* states adults are ready to learn things that they think they must know and how the teachings can relate to real-life situations. The adults' *orientation to learning* is life-centred (or task-centred, or problem-centred), meaning the adult learner is seeking to apply their knowledge to problems or tasks in their life. Finally, the adults must have the *motivation to learn*, meaning as people mature, their motivation to learn becomes more internalized. For example, the internal sources of motivation could be increased self-esteem or increased quality of life. To summarize, Knowles' APM, these andragogic principles teach us that adults learn best in environments in which their experience is an asset, as well as where they are motivated, self-directed, provided explanations, and can collaboratively solve problems.

Upon identifying the APM, Callary, Rathwell, and Young (2017) were the first to explore the theoretical overlap between APM's principle and coaching MAs. Specifically, the authors conducted semi-structured interviews with 11 Masters coaches to determine what specific aspects of the APM would coincide with the coaches' general practices when teaching MAs. The data were analyzed using thematic analysis, in that the six abovementioned APM principles informed the newly observed sport-specific themes. The six themes identified were: a) *bidirectional patterns relating to adults' need to know*, b) *mature self-concept of MAs*, c) *life*

*experiences of the learner*, d) *personalized goal orientation to learning*, e) *motivation to learn*, and f) *readiness to train*. First, the *bidirectional patterns relating to adult's need to know* can be explained as a reciprocal process by which the coach explains why the MAs are learning something up-front, thus allowing the MAs to be inquisitive and seek further validation as to why they are learning something. The explanation of MAs' *mature self-concept* can vary based on the coaching scenario and the individual athlete. Coaches must provide autonomous opportunities for their MAs in training; however, this can fluctuate based on the type of learning situation (e.g., learning a new movement as a group) and the individual (e.g., an athlete sluggish when given autonomy). The *life experiences of the learner* describes how MAs can bring a broad variety of expertise and wealth from inside and outside of sport, thus coaches must tailor their practices to the heterogeneity of MAs' experiences. Next, *personalized goal orientation to learning* suggests that coaches must orient the MAs' learning to authentic competition-like scenarios while keeping in mind MAs' individualized goals. *Motivation to learn* describes that coaches should use a variety of approaches to motivate their MAs to capture their heterogeneity (e.g., pointing out improved performance for individuals and the group). Finally, *readiness to train* emphasizes a cyclical approach whereby the coach's approach to training is influenced based on the individual MAs' readiness to train, then the MAs' readiness to train influences the coaches adapting approaches. Callary et al.'s study was important because it identified various sport-specific coaching practices from coaches of MAs that were grounded in an established adult education framework (i.e., APM). By marrying adult education and adult sport, Callary and colleagues defined adult coaching principles for researchers to test and understand in Masters sport.

While Callary et al., (2017) were the first to marry concepts from adult education and adult sport, their study did not look at how the newly established adult coaching principles were uniquely applicable in Masters sport when compared to other athletic cohorts. MacLellan et al. (2019) built upon Callary et al.'s (2017) study by interviewing a coach, who coached both youth and MAs, to determine the differences among the athlete cohorts. The results from the interview were deductively analyzed according to the six principles from APM (i.e., the learners' need to know, self-concept of the learner, prior experiences of the learner, readiness to learn, orientation to learning, and motivation to learn). The results showed that the Masters coaching context aligned with the APM, while the youth coaching context did not fit as well. For example, the coach noted her MAs need to know why they were doing drills, while the coach's youth athletes often did not reflect upon why they were doing certain drills. More specifically, she stated that when working with her group of MAs, she often told them what to do at the start of the drill, but then started to ask questions about the drill and explained why it matters. Conversely, when trying to teach her youth cohort a drill, the coach described how she often told them what to do and that they would just follow her lead without questioning her.

Overall, the studies (e.g., Callary et al., 2017; MacLellan et al., 2019) are important because they depict how the APM has the potential to address the unique context of coaching adult athletes. Although the second study showed that the adult-specific coaching practices were more frequent in adult athlete cohorts, a significant limitation remained. The problem was that there was no tool to measure the frequency of the coaching practices used, meaning there is no way to provide statistical evidence to support the data from the interviews. Additionally, because the practices are not being measured, there is no way to statistically link the coaching practices to indicators of a quality sport experience.

### *A Quantitative Assessment to Measure Adult-Oriented Coaching Practices*

Although MacLellan et al. (2019) addressed the link between adult education and adult sport by showcasing the use of adult-specific coaching practices, there was yet to be a quantitative tool for coaches, MAs, and others, to assess these practices. Self-report instruments are important for coaches and MAs because they provide valuable information for coaches to improve their coaching proficiencies and effectiveness (Tooth et al., 2013). In the context of Masters sport, however, there remains little to no resources for coaches to learn and improve their craft (Callary et al., 2020; Callary et al., 2018; Young et al., 2014). To the best of our knowledge, only two studies have attempted to create such a tool with adult sport in mind. First, Young et al. (2020) scoured the adult education literature to find a measurement tool that had already been established (e.g., the Instructional Perspectives Inventory; Henschke, 1994). This tool has been used to assess coaches and instructors of adult students in learning environments such as graduate and undergraduate education (Drinkard & Henschke, 2004; Henschke, 1994). Upon testing this tool in Masters sport, however, coaches noted that the tool did not capture the essence of coaching adult athletes (Young et al., 2020). The authors concluded that the tool was too specific to education and that a future tool must incorporate sport-specific nuances to reflect coaching adult athletes.

In the second study, the authors (Rathwell et al., 2020) sought to create a tool for measuring coaching practices specific to Masters sport, and abandoned the idea of using an already established tool from adult education. Specifically, Rathwell et al. (2020) generated a preliminary survey consisting of 50 items and 13 themes from previous qualitative literature with respect to coaching MAs (Callary et al., 2015; Callary et al., 2017; Ferrari et al., 2016; MacLellan et al., 2016; Rathwell et al., 2015; Young et al., 2014). Upon establishing face

validity with a small sample of 12 Masters coaches, large samples of Masters coaches ($n$ = 383) and MAs ($n$ = 467) completed the 50-item survey. The authors removed several problematic items and showed that the coaches' data supported the factorial validity and reliability of a shorter 22-item, five theme survey. Later, the MAs' data confirmed the factorial validity and reliability of the same 22-item survey.

The resultant 22-item survey was named the Adult-Oriented Sport Coaching Survey (AOSCS; Rathwell et al., 2020). The 22 items fit into five comprehensive coaching themes: (a) *Considering the Individuality of Athletes* (CIA), (b) *Framing Learning Situations* (FLS), *Imparting Coaching Knowledge* (ICK), *Respecting Preferences for Effort, Accountability and Feedback* (RPE), *and Creating Personalized Programming* (CPP). *Considering the Individuality of Athletes* assesses how often the coach tailors his/her approach to the athlete's experiences and motives when planning, organizing, and delivering practices. *Framing Learning Situations* evaluates the frequency to which the coach frames learning situations for their adult athletes through self-discovery, problem-based scenarios, modelling, and assessments. *Imparting Coaching Knowledge* explores how often the coach shares his/her relevant experiences, knowledge, and coaching development, with their athlete. *Respecting Preferences for Effort, Accountability, and Feedback* classifies the coach's willingness to have adaptive learning approaches whiles considering his/her adult athletes' wishes to be held accountable regarding their effort and how they desire to be provided feedback. Finally, *Creating Personalized Programming* explains how often the coach considers and integrates their athletes' needs and abilities when scheduling, programming for the long-term, and when supporting the athlete during events.

In sum, Rathwell et al.'s (2020) study used results from several qualitative works, along with an adult education model, to produce an easy to understand, and valid and reliable tool, to measure adult-oriented coaching practices. Although it was a preliminary study, it filled a void in the literature as it was the first adult-oriented tool created for coaches and personnel of Masters sport. It also acts as a self-assessment tool for coaches of MAs, whereby coaches and MAs may obtain information related to the use of, or lack thereof, adult-oriented coaching practices. Further, this study gives researchers a valuable tool needed to understand if these practices are beneficial or detrimental to the quality sport experiences of heterogeneous adult athletes.

**Literature Review Summary**

Overall, in this literature review we have five aspects of a QMSE (i.e., quality relationships, feeling empowered, feeling validated, mastery, and fun and fitness) that are beneficial and important to MAs. Specifically, evidence supports that MAs' sport commitment, enjoyment, and investment, as well as their practice-liking, basic needs, relationship with their coach, are vital components in creating or maintaining a QMSE. With this said, there were minimal, or no devices, such as coaching practices, that were identified in the literature as being responsible for creating or maintaining these aspects of a QMSE. With the newly developed tool (i.e. AOSCS; Rathwell et al., 2020) for measuring adult-specific coaching practices, we may now begin identifying specific coaching practices that either enhance or detract from the quality of MAs' sport experiences. Currently, several questions remain unanswered in the literature: How do adult-oriented coaching practices affect the quality sport experience for MAs? Are adult-oriented coaching practices (some or all) beneficial or detrimental to MAs' sport experience? Answering these questions would have implications for adult sport and coaching policies, coach education and adult athlete development materials, all of which presuppose youth-oriented

research. Obtaining knowledge about coaching nuances that compliment or detract the experience of MAs in sport would be an exciting and necessary development for adult sport and sport for life.

**Purpose**

The purpose of this thesis is to quantitatively examine the relationships between adult-oriented coaching practices and outcomes that infer a quality sport experience for MAs. Two over-arching questions guided this study: (a) Do adult-oriented coaching practices predict outcomes related to a quality sport experience for MAs? (b) Does the level of congruence between coaches' practices, and MAs' perceptions of adult-oriented coaching practices, influence the quality of the sporting experience for MAs?

## Chapter 2: Adult-Oriented Coaching Practices Promote Quality Sport Experience Outcomes for Masters Athletes: A Two-Phase Study


### Abstract

Adult-oriented coaching practices have been described qualitatively by Masters athletes (MAs) as a preferred method to receive coaching (Callary et al., 2017) and to foster hallmarks of Quality Masters Sport Experiences (QMSE; Young et al., 2021). The development of the Adult-Oriented Sport Coaching Survey (AOSCS; Rathwell et al., 2020) provides researchers with a tool to quantitively assess adult-oriented coaching practices. Therefore, the purpose of this study was to longitudinally examine relationships between adult-oriented coaching practices and three hallmarks of QSME (i.e., *quality relationships*, *feeling empowered*, and *mastery*). Over eight weeks during their sporting seasons, 103 MAs ($M_{age}$ = 51.5, $SD$ = 9.9) completed a survey at two-time points consisting of the AOSCS, the Coach-Athlete Relationship Questionnaire (Jowett & Ntoumanis, 2004), the Basic Needs Satisfaction in Sport Scale (Ng et al., 2011), the Psychological Needs Thwarting Scale (Bartholomew et al., 2011). Path analyses using change scores showed that MAs' perceptions of their coaches' general use of adult-oriented coaching practices over time were related to all aspects of quality coach-athlete relationships and the satisfaction of MAs' basic needs with small to medium effect sizes ($B$ = .18 to .41). Cross-sectionally, path analyses at both time points revealed similar results with small to large effect sizes ($B$ = -.46 to .68). Further, we also interpret and discuss the relationships between the five specific adult-oriented coaching practices and the same QMSE criterion outcomes for MAs. Our findings provide evidence of the criterion-validity for the AOSCS and suggest a degree of causality between adult-oriented coaching practices and MAs' hallmarks of QMSE.

## Introduction

Masters Athletes (MAs) are one of the fastest-growing cohorts in Westernized countries (Baker et al., 2010). MAs are generally over 35 years of age, formally registered in sport, and practice/train to prepare for competition (Young et al., 2018). Large-scale Masters sporting events, like the most recent World Masters Games (WMG), had over 24,000 athlete participants, which easily doubled the participant pool of the 2016 Olympic Games (i.e., 11, 238 athlete participants; International Olympic Committee, n.d.). The WMG is expected to grow beyond 50,000 athletes at the 2021 World Masters Games in Kansai (postponed until 2022; World Masters Games, n.d.). Due to the unprecedented growth of Masters sport, researchers have gained interest in studying MAs and the benefits they receive from participating in Masters sport.

When studying MAs, researchers have noted several psychosocial benefits that MAs have garnered from sport. For instance, Gayman et al. (2017) reported that MAs have enhanced cognitive functions (as compared to similarly aged others), experience positive emotions (e.g., enjoyment, excitement, challenge), develop positive social networks (e.g., new interactions, friendships, relationships) and satisfy a variety of participatory motivations (e.g., health promotion, maintaining/enhancing sports skills, enjoyment) from their sport involvement.

Considering the many benefits of sport participation for MAs, researchers (e.g., see Hoffmann et al., 2019) have explored what factors are responsible for promoting the benefits. One factor that may be particularly important for promoting benefits for MAs is the coaching they receive. For example, studies have shown that MAs with coaches have increased autonomous motives (Appleby & Dieffenbach, 2016; Medic et al., 2012), are more committed (Santi et al., 2014), have more positive social interactions (Currie, 2019), and have increased in performance (Ferrari et al., 2016). These studies show that coaches are beneficial for MAs;

however, the studies do not provide information about *why* coaches are beneficial, and about *what* coaching behaviours and practices help produce these additional benefits for MAs.

More recently, researchers (Callary et al., 2015; Rathwell et al., 2015; Young et al., 2014) have started investigating the reasons behind why having a coach is beneficial to MAs. Young et al. (2021) presented eight hallmarks of a Quality Masters Sport Experience (QMSE). Specific to the competitive orientation of sport, two aspects of the QMSE include *meaningful competition*, and *testing and assessing oneself*. Related to one's physical and cognitive interest in sport, two aspects of the QMSE include engaging in *fun and fitness* activities and having *intellectual stimulation* while engaging in sport. Related to one's psychological orientation, sport provides an avenue to *feel empowered* and *validated*, and to develop self-efficacy through *mastery*. Finally, the psychosocial aspect of sport includes *quality relationships*, whereby MAs seek beneficial social connections and belongingness within their sport environment. Considering these outcomes are important aspects of why adults engage in sport, it becomes imperative to understand what mechanisms (i.e., coaches, teammates, etc.) within the Master sport environment stimulate and maintain these eight hallmarks of a QMSE.

Specifically, MAs have identified coaches as being very important for their sporting experience. Callary et al. (2015) interviewed 12 Masters swimmers who identified that their coaches helped benefit their self-efficacy and interest. Building on these findings, 11 coaches in Callary and colleagues' (2017) qualitative study made efforts to ensure that their MAs felt a sense of autonomy. The coaches answered numerous questions from their MAs about what they were learning. Coaches also noted MAs' wealth of knowledge and experiences inside and outside of sport, and how the coach's approach influenced the MAs' readiness for a given task, and conversely how the MAs' readiness to learn influenced the coach's approach. Further, the

coach had to consider the heterogeneity of their MAs' goals and they attempted to provide each MA with the opportunity to feel like they wanted to be coached and wanted to come back to learn more. Similarly, MacLellan and colleagues' (2017) case study compared a coach's use of adult learning principles with separate groups of Masters and youth athletes. These qualitative studies would suggest that an adult-oriented coaching approach matters (Callary et al., 2015; Callary et al., 2017, 2018). However, the links between adult-specific coaching and aspects of a QMSE are unclear.

To address the gap between adult-specific coaching and a QMSE, it is possible to explore survey instruments. Rathwell et al. (2020) developed a tool to measure adult-oriented coaching practices. First, they formulated survey questions using data from their previous qualitative studies on coaching Masters sport (e.g., see Callary et al., 2015; Callary et al., 2017; MacLellan et al., 2019). They then tested the structural validity and reliability of their assessment tool using independent samples of MAs ($n$ = 467) and coaches of MAs ($n$ = 383). After removing problematic items, based on both theoretical and statistical decisions, they established a 22-item inventory that assesses five adult-oriented coaching practices, known as the Adult-Oriented Sport Coaching Survey (AOSCS; Rathwell et al., 2020).

The five adult-oriented coaching practices of the AOSCS include: a) considering the individuality of athletes, b) framing learning situations, c) imparting coaching knowledge, d) respecting preferences for effort, accountability, and feedback, 5) creating personalized programming. *Considering the individuality of athletes* describes that the coach should tailor their approach to each of their adult athletes' experiences and motives when planning, organizing, and delivering practice. *Framing learning situations* is the coach's approach to framing learning through self-discovery, problem-based scenarios, modelling, and assessments.

*Imparting coaching knowledge* is concerned with the coach enriching the learning environment based on the coaches' athletic experiences, knowledge, and professional development. *Respecting preferences for effort, accountability, and feedback* describes how the coach can adapt and individualize their approach based on their athletes' preferences. Finally, *creating personalized programming* is how the coach adapts and tailors scheduling, season-long plans, and support based on each athlete's needs and skills. Overall, the AOSCS offers a measurement tool that can be used to assess how frequently adult-oriented coaching practices are used by coaches, from the perspective of both coaches and their MAs. However, what we do not know from Rathwell et al.'s (2020) study is how the five aforementioned adult-oriented coaching practices connect to the eight hallmarks of a QMSE.

For this study, we chose to assess the effectiveness of adult-oriented coaching practices based on their relationship with the hallmarks of a QMSE. Specifically, we were interested in MAs' *quality relationships*, or in this case, the quality of their coach-athlete relationship (CAR), as well as the fulfillment of MAs' basic psychological needs (BPN), which addresses psychological aspects in the QMSE (i.e., *feeling empowered, validated,* and *mastery*).

Firstly, concerning the CAR, Jowett & Ntoumanis' (2004) 3+1Cs model is widely used to understand the coach's and athlete's closeness, commitment, complementarity, and co-orientation. *Closeness* is the coach's and athlete's mutual trust and respect. *Commitment* is the coach's and athlete's mutual intent to maintain the CAR over time. *Complementarity* is the coach's and athlete's cooperative interactions, especially during training. Finally, *co-orientation* reflects how similar a coach and their athlete feel about the closeness, commitment, and complementarity aspects of their CAR. To our knowledge, Jowett and Ntoumanis' (2004) 3+1Cs model has only been examined once in the context of Masters sport. Specifically, Currie (2019)

followed a team of 20 Masters synchronized skaters and their coach across a full season. Currie (2019) found that many athletes considered that their trust and respect for their coach extended beyond sport, and felt their coach was an important part of their life on and off the ice (i.e., closeness). The coach and the skaters also indicated intentions to maintain their relationship throughout the season, and into future seasons (i.e., commitment). Moreover, the coach adapted their feedback based on each skater's preferences across the season (i.e., complementarity). Finally, the coach and her skaters showed a high degree of co-orientation based on similar feelings of closeness, commitment, and complementarity. This study showed the importance of the CAR and how a coach and their MAs can each be responsible for creating a higher QMSE. Callary et al. (2020) advocated for further understanding of how the CAR is related to adult-oriented coaching approaches. Since coaches are beneficial for a QMSE, it may be useful to pinpoint which adult-oriented coaching practices can affect MAs' feelings of closeness, commitment, and complementarity. This would help address gaps in the literature by showing what coaches are specifically doing to facilitate *quality relationships* with their MAs.

Secondly, looking at BPN, Ryan and Deci (2017) describe that all humans have three BPN (autonomy, competence, and relatedness) that must be satisfied to foster well-being. In sport, *autonomy* refers to an athlete being the source of their behaviour (Ng et al., 2011). *Competence* is an athlete's feelings of effectiveness in the ongoing interactions within the sports environment (e.g., sports skills and social interactions). *Relatedness* refers to the athlete feeling connected to others, or rather, a sense of belongingness with the environment. Importantly, an individual's BPN can also be thwarted or frustrated causing ill-being (as opposed to well-being).

In the context of Masters sport, MAs have expressed their inherent need for (a) *autonomy* through self-directed activities and choices during training (MacLellan et al., 2019), (b)

*competence* by learning, refining, and mastering sport skills (Kowal & Fortier, 2000), and (c) *relatedness* by feeling they belong in the Master sport environment, and that they maintain the relationships they built in sport, both inside and outside of sport (Hodge et al., 2008). These studies indicate that MAs' autonomy, competence, and relatedness are important indicators of the quality of their sport experience. Additionally, Hoffmann et al. (2019) found that coached MAs, as compared to non-coached MAs, were generally more satisfied in terms of their BPN. These studies are insightful; however, they do not link any types of adult-oriented coaching practices to MAs' BPN satisfaction. Further, we do not know how changes in adult-oriented coaching practices may relate to changes in a QMSE throughout Masters sporting seasons. Taken together, by measuring these outcomes (i.e., CAR and BPN) for MAs, we can begin to understand how adult-oriented coaching practices relate to positive outcomes for MAs, and from this, we can infer that these practices are effective for creating a QMSE.

The purpose of this two-phase longitudinal study was threefold: a) to cross-sectionally evaluate if adult-oriented coaching practices are related to a QMSE b) to determine if and how adult-oriented coaching practices change throughout a season; and c) to longitudinally examine how changes in adult-oriented coaching practices are related to a change in the QMSE.

## Methods

### *Procedure*

Before data collection, ethical clearance was obtained from the Research Ethics Board. Following ethical clearance, MAs and their coaches were recruited via two formats: a) from publicly available online sources, and b) at regional Masters sporting events in Canada and Australia. When recruiting online, we searched for groups of MAs and their coaches on social media websites (e.g., Facebook and Twitter) and team/club websites. Specifically, we looked for

the contact information of coaches, club managers, or club representatives. Using their publicly available contact information, we then emailed coaches, club managers, or club representatives with a recruitment script (Appendix 1-2) that indicated the purpose, procedures, and potential benefits or risks of this study. If coaches indicated that they were interested in participating in this study, they were sent a link where they completed a consent form, a demographic questionnaire, and answered questions about their coaching practices (Appendix 4). Interested coaches were also asked to forward a link to their MAs, which outlined the purpose, procedures, and potential risks or benefits of this study (Appendix 2-3). Further, the link directed MAs to a survey where they completed a consent form, a demographic questionnaire, and answered questions about their coaches' practices, their relationships with their coaches, and their BPN (Appendix 5).

We also recruited from in-person regional Masters sporting events in Canada and Australia. Concerning recruiting at in-person events, we first gained permission from event managers to recruit MAs and their coaches at the live event (Appendix 1-2). After gaining permission to speak to MAs and their coaches, we briefed the potential participants on the purpose, procedures, and potential benefits or risks of this study. If coaches and their athletes agreed to participate, we provided them with a hard copy of the survey. The coach hardcopy asked them to complete a consent form, a demographic questionnaire, and asked questions about their coaching practices (Appendix 4). The MAs' hardcopy asked them to complete a consent form, demographic questionnaire, and questions about their coaches' practices, their relationships with their coaches, and their BPN (Appendix 5).

Of importance, we were interested in obtaining matched data from coaches and their MAs. Since we were recruiting multiple coaches and their athletes, it was important to identify

which athletes belonged to which coaches. To match coaches and their MAs (whether they were recruited online or in-person), we assigned a unique code to each group (i.e., a coach and their MAs) after they consented to participate, which they then would input at the beginning their respective coach or athlete surveys.

For the current study, we were also interested in how coaches and MAs' responses changed throughout the sport season (i.e., across eight weeks during the sporting seasons). Eight weeks was chosen for two reasons: a) it allowed for approximately two mesocycles (i.e., average four weeks each) of periodization training (Bompa & Haff, 2009), and (b) it was a short enough to ensure that athletes' sport seasons were still ongoing at time two. If coach and athlete groups were not in season or practicing regularly, we did not collect data until they were actively participating in sport. This ensured the coaches and athletes were not removed from the sport experience and would be able to better recall information. As such, at the end of the first coach and athlete survey, we asked for their contact information and for permission to contact them eight weeks later to complete a second survey (Appendix 6). The second coach and athlete surveys were identical to the surveys eight weeks prior, with the exception that the second survey did not include the demographic questionnaire.

Importantly, the current study was underway during the emergence of the COVID-19 crisis, and sport participation was cancelled globally. We decided to send out a link on March 18$^{th}$, 2020, asking the remaining participants (6 coaches and 17 MAs) who had not completed both time points, to complete the second survey (even if eight weeks had not passed by). We terminated data collection for the study on March 25, 2020. The decision to cut data collection short was made to preserve these participants' data set and because we wanted to ensure that participants could recall how they had recently interacted with one another.

***Participants***

A total of 54 coaches and 281 MAs started the survey, and 48 coaches and 228 MAs completed time point one (T1). A total of 37 coaches and 228 MAs started the second survey, and 37 coaches and 163 MAs finished the survey at time point two (T2). Thus, five coaches and 40 MAs were removed for not completing all the requirements. Since we were interested in paired responses from coaches and their MAs across the season, we removed any participants who did not have paired data with their respective counterparts. In total, four MAs were removed because their coach did not complete their respective surveys. No coaches were removed for not having at least one athlete who completed both of their respective surveys. Notably, ten additional MAs were removed because they completed the surveys multiple times (i.e., duplicate cases). Finally, we felt it was important to ensure that all athlete participants met the criteria to be considered MAs in their respective sports. We identified three athletes who were deemed to be too young to be considered as MAs in their respective sport ($n$ = 2 speedskating; $n$ = 1 running). These athletes were removed from the main analyses.

As another measure to ensure the integrity of our data, we looked for outliers within our data. We found three statistical outliers in the MAs' responses pertaining to their coaches' use of adult-oriented coaching practices. Considering the impact that the COVID-19 pandemic might have had on our sample, we then checked to see when the outliers completed the surveys. Upon checking the dates of completion, the three outliers had completed the second survey during the COVID-19 quarantine protocols. Thus, instead of treating the data statistically (e.g., windsorizing), we decided that these data may be especially compromised, and thus removed them from the study. Overall, the final sample consisted of 32 coaches and 103 MAs, making up 32 unique paired groups.

The final sample of MAs ($M_{age}$ = 51.46, *SD* = 9.89) identified as female (62.1%) and male (37.9%). MAs identified as being Caucasian/White (96.1%), African American (1.0%), Hispanic (1.0%), or Aboriginal (1.0%). The MAs' sample indicated having a graduate degree (46.6%), an undergraduate degree (36.9%), a college diploma (11.7%), or a high school diploma (4.9%). At the time of the study, the sample of MAs resided in Canada (87.4%) and Australia (12.6%). On average, the MAs started Masters sport at the age of 36.71 years (*SD* = 13.73). MAs indicated their primary sports as swimming (47.6%), cross-country skiing (15.5%), speed skating (9.7%), artistic skating (5.8%), and various others (e.g., triathlon, biathlon, rowing, running, water polo, judo, alpine skiing, and artistic swimming). MAs participated in their primary sport for an average of 9.47 months per year (*SD* = 2.59), 3.28 times per week (*SD* = 1.91), and 3.73 hours per week (*SD* = 2.03). MAs competed in 2.10 events on average in the past twelve months (*SD* = 3.18) which ranged from recreational to internationally competitive. On average, MAs were with their current coach for 3.68 years (*SD* = 3.88) and reported their coach was on site for practice/training 1.99 times per week (*SD* = 0.93).

The final sample coaches ($M_{age}$ = 49.00, *SD* = 17.25) identified as male (53.1%) and female (46.9%). The coaches identified as being Caucasian/White (96.9%) or Asian (3.1%). The coach sample indicated having an undergraduate degree (43.8%), a college diploma (25.0%), a graduate degree (15.6%), or a high school diploma (15.6%). At the time of the study, the coaches resided in Canada (90.6%) and Australia (9.4%). On average, coach participants reported being coaches for 15.97 years (*SD* = 10.24) and coaching Masters sport for 9.19 years (*SD* = 6.34). The coaches had various qualifications including level 1, 2, and 3 coaching certifications, Canadian coach education certification, and courses specific to their sport. Three coaches noted that they had certifications (or had taken courses) specific to their Masters sport. The sample coached

adult athletes 9.78 months per year (*SD* = 2.38), 3.28 times per week (*SD* = 2.75), and 5.25 hours per week (*SD* = 4.70). On average, the coaches indicated they attended 3.14 Masters sport events in the past twelve months (*SD* = 3.65) ranging from recreational to international competition levels. Finally, the coaches indicated that coaching was their primary (18.8%) or secondary means of employment (46.9%), while all others indicated they volunteered their services (18.7%).

### *Coach Measures*

**Adult-Oriented Sport Coaching Survey (AOSCS).** The coach version of the AOSCS (Rathwell et al., 2020) was used to assess the coach's frequency of using adult-specific coaching practices at both time points. The AOSCS has 22 items that assess five factors: *Considering the Individuality of Athletes* (CIA), *Framing Learning Situations* (FLS), *Imparting Coaching Knowledge* (ICK), *Respecting Preferences for Effort, Accountability, and Feedback* (RPE), and *Creating Personalized Programming* (CPP). Coaches responded to items using the stem "How frequently do you" and indicated their response on a 7-point Likert Scale ranging from 1 (never) to 7 (always). Rathwell et al. (2020) showed evidence for the factorial validity and reliability of the coach-version of the AOSCS with a sample of 383 Masters coaches ($\chi^2$ (131) = 202.56, $p <$ .001, $\chi^2/df$ = 1.55, CFI = .956, SRMR = .027, RMSEA = .038 [90% CI = .027, .048]).

### *MAs' Measures*

**Adult-Oriented Sport Coaching Survey (AOSCS).** The athlete version of the AOSCS (Rathwell et al., 2020) was used to assess athlete's perceptions of their coach's frequency of using adult-specific coaching practices. The athlete version of the AOSCS has the same items and factors as the coach version; however, items are framed from the MAs' perspective (e.g., "My coach considers what I want to accomplish when organizing my training"). Items were

measured on a 7-point Likert Scale from 1 (never) to 7 (always). Like the coach version of the AOSCS, Rathwell et al. (2020) showed evidence for the factorial validity and reliability of the athlete-version of the AOSCS with a sample of 467 Masters coaches ($\chi^2$ (131) = 234.89, $p$ < .001, CFI = .977, SRMR = .019, RMSEA = .041 [90% CI = .033, .050]).

**Basic Needs Satisfaction in Sport Scale (BNSSS).** The BNSSS (Ng et al., 2011) was used to assess MAs' degree of satisfaction with their BPN (i.e., autonomy, competence, relatedness). The BNSSS has 20 items and five factors: Competence, Relatedness, and three aspects of Autonomy (i.e., choice, volition, and internal perceived locus of causality; IPLOC). Specifically, *autonomy choice* refers to an individual's decision-making power within an activity; *autonomy volition* refers to an individual's willingness to engage in a task/activity; and *autonomy IPLOC* refers to an individual's perception that their actions are self-initiated/regulated. The items were measured on a Likert Scale from 1 (not true at all) to 7 (very true). Motz et al. (2019) showed evidence for the factorial validity and reliability of the BNSSS in a sample of 402 MAs ($\chi^2$ (160) = 400.42, $p$ < .005, CFI = .908, SRMR = .065, RMSEA = .061).

**Psychological Needs Thwarting Scale (PNTS).** The PNTS (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011) was used to assess MAs' degree of thwarting, or frustration, on their BPN. The PNTS has 12 items and three factors: Autonomy, Competence, Relatedness. The three factors represent the three BPN. The items were measured on a Likert Scale from 1 (not true at all) to 7 (very true). Motz et al. (2019) showed evidence for the factorial validity and reliability of the PNTS in a sample of 402 MAs ($\chi^2$ (51) = 70.56, $p$ < .005, CFI = .983, SRMR = .041, RMSEA = .031).

**Coach-Athlete Relationship Questionnaire (CART-Q).** The CART-Q (Jowett & Ntoumanis, 2004) was used to assess MAs' perceptions of their relationship with their coach. The CART-Q contains 11 items and three factors: Closeness, Commitment, and Complementarity. The items were measured on a Likert Scale from 1 (strongly disagree) to 7 (strongly agree). Motz et al. (2019) showed evidence for the factorial validity and reliability of the CART-Q in a sample of 402 MAs ($\chi^2$ (41) = 118.56, $p$ < .005, CFI = .950, SRMR = .039, RMSEA = .068).

## Data Analyses

### *Preliminary Analyses*

For the coaches' data, only 0.90% of values were missing at T1, and 0.69% of values were missing at T2. For the MAs' data, only 1.5% values were missing at T1, and 1.6% of values missing at T2. When less than 5% of data are missing, influences of missing data are negligible (Tabachnick & Fidell, 2019). Missing data were treated with multiple imputations using an expectation-maximization method (Tabachnick & Fidell, 2019).

Of importance, the attrition rate was 22.9% for coaches and 61.3% for MAs. As noted earlier in this paper, data collection was ongoing during the initial stages of the COVID-19 crisis which may have had a significant impact on attrition. This may have led to many coaches and MAs not being able to complete the second survey because their sporting seasons were cancelled, and their facilities were closed. As such, we believed it was important to compare participants who dropped out to those who completed the study based on their demographics and our variables of interest. To compare coaches who completed both phases of the study to those coaches who dropped out, one-way ANOVAs were performed with drop-out status (i.e., completed vs. drop-out) as the independent variable, and demographic variables (i.e., age,

gender, ethnicity, country of residence, education level, sport type, paid/unpaid, years coaching, years coaching MAs, months per week coaching, times per week coaching, and hours per week coaching) and adult-oriented coaching practices as the dependent variables. Overall, no differences were found between the coach groups on all variables of interest.

One-way ANOVAs were also performed to compare MAs who completed both phases of the study to MAs who dropped out. Drop-out status (i.e., completed vs. dropped-out) served as the independent variables, while demographic variables (i.e., age, gender, ethnicity, country of residence, education level, sport type, months per year participating, times per week participating, coached times per week, and age started Masters sport), as well as adult-oriented coaching practices, aspects of the CAR, and BPN satisfaction/thwarting, acted as the dependent variables. Significant differences were found on two demographic variables: the number of times per week participating in sport, $F(1,212) = 5.51$, $p = .020$, and how often the MAs were coached per week, $F(1,211) = 8.85$, $p = .003$. More specifically, MAs who completed the study participated in sport less frequently ($M = 3.27$ times per week) and were coached less frequently ($M = 2.05$ times per week) than MAs who dropped out of the study ($M = 3.89$ and $M = 2.55$ times per week, respectively). Additional differences between groups existed on two variables of interest: autonomy thwarting, $F(1,212) = 4.45$, $p = .036$, and competence thwarting, $F(1,212) = 4.01$, $p = .046$. Specifically, MAs who completed the study perceived lower autonomy ($M = 6.16$) and competence ($M = 5.26$) thwarting than MAs who dropped-out of the study ($M = 7.22$ and $M = 6.14$, respectively). These findings need to be considered when interpreting the results of this study and will be discussed in the limitations section.

***Main Analyses***

The main analyses will be divided into three sections based on our research questions. In the first section, we describe cross-sectional associations between MAs' adult-oriented coaching practices responses and their responses for QMSE outcomes. In the second section, we examine how coaches' and MAs' perceptions of adult-oriented coaching practices have changed over time. Finally, in the third section, we analyze associations between MAs' perceived change in their coaches' use of adult-oriented coaching practices and the change in MAs' QMSE outcomes.

***Are Adult-Oriented Coaching Practices Associated with a Quality Masters Sport Experience?***

We employed path analysis using the maximum likelihood estimator (MLM) in Mplus Version 8.0 (Muthén & Muthén, 2017) to test cross-sectional associations between MAs' perceptions of their coaches' use of adult-oriented coaching practices (i.e., AOSCS scores) and their QMSE outcomes (i.e., CART-Q, BNSSS, and PNTS). Prior to all path analyses, I tested the data for statistical assumptions specific to path analyses (Barbeau et al., 2019). First, as stated prior, missing data was filled using multiple imputations. All variables were also examined for normality. While most variables were within the thresholds for skewness (larger than 2 or smaller than -2) and kurtosis thresholds (larger than 7 or smaller than -7; Barbeau et al., 2019), the decision was made to not transform the data. This is acceptable since a maximum likelihood estimator (e.g., MLM) was used in the path analyses which are robust to non-normal data and enhances the normality of the variables (Muthén & Muthén, 2017). Further, the data was checked for univariate and multivariate outliers. As stated prior, three particpants who were flagged as univariate outliers (based on the COVID-19 pandemic dates) were removed from the dataset. No additional univarite or multivariate outliers existed. Further, the measurement scales used showed no evidence of multicolinearity in previous research conducted on MAs: AOSCS (Rathwell et al., 2020); CART-Q (Motz et al., 2019); BNSSS and PNTS (Hoffmann et al., 2019;

Motz et al., 2019). This was evidenced further in our path analyses were associations between factors did not exceed the threshold which indicates multicolinearity ($r$ = .85; Kline, 2005). Finally, for path analyses it is reccommended that the sample size exceeds a minimum of five participants per parameter measured (Kelloway, 2014) and a minimum of 100 particpants. Our data for the MAs in our study exceeded this threshold (i.e., $n$ = 103). After conducting these checks for assumptions, we were confident in moving forward with path analysis in this study. In total, four cross-sectional path analyses were conducted, with the first two using data from T1, and the second using data from T2.

For the first path analysis, using data from T1, we were interested in the relationships between *specific* adult-oriented coaching practices and our measures of a QMSE. To calculate the *specific* adult-oriented coaching practices, we created factor scores by summing the items that were designed to capture their respective AOSCS theme (Rathwell et al., 2020). The five summed factor scores (i.e., CIA, FLS, ICK, RPE, CPP) acted as the independent variables in the first path analysis. To calculate QMSE outcomes, we also summed items that captured their respective themes regarding the CAR (Jowett & Ntoumanis, 2004; closeness, commitment, and complementarity), MAs' BPN satisfaction (Ng et al., 2011; autonomy IPLOC, autonomy volition, autonomy choice, competence, and relatedness) and MAs' BPN thwarting (Bartholomew et al., 2011; autonomy, competence, and relatedness). The summed factor scores for our QMSE outcomes acted as the dependent variables in the first analysis. See Table 1.1 for the descriptive statistics related to MAs' factor scores.

For the second path analysis at T1, we were interested in the relationships between MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices and our QMSE outcomes. To calculate the factor score representing coaches' *general* use of adult-oriented

coaching practices, we summed all the items from the AOSCS (see Table 1.1). This summed factor score representing MAs' *general* perceptions of their coaches' use of adult-oriented coaching practices acted as the independent variable in the second path analysis at T1. Like the first analyses above, the summed factor scores representing our QMSE outcomes acted as the dependent variables for the second analysis at T1.

For our third and fourth path analyses, which used data from T2, we created our independent and dependent variables in the same manner (i.e., summing of items). See Table 1.1 for descriptive statistics for T2.

***Do Adult-Oriented Coaching Practices Change Over Time?***

The purpose of the second analysis was to determine if adult-oriented coaching practices changed over the eight-week data collection period. ANOVAs and ANCOVAs were performed using IBM SPSS Statistics 26 (IBM Corp., 2018) to test whether MAs' and coaches' perceptions of coaches' use of adult-oriented coaching practices changed over time. More specifically, multiple repeated-measures ANOVAs were performed to compare the means of the MAs' and coaches' responses as it pertains to the AOSCS. Like the first main analysis, we used the summed themes from the AOSCS (i.e., CIA, FLS, ICK, RPE, CPP), as well as a *general* adult-oriented coaching practice score (summation of the themes of the AOSCS).

Of note, before running the ANOVAs, it was important to check for potential covariates for both the MAs' and coaches' data because they may affect perceptions of the coaches' use of adult-oriented coaching practices. To identify covariates, we assessed the relationships between demographic variables and the adult-oriented coaching practice variables using bivariate correlations. More specifically, for our coach data, we tested age, gender, ethnicity, level of education, country of residence, primary sport coached, amount of remuneration received for

coaching, how many years they have coached MAs (or others, respectively), how many months, hours per week, and times per week the coaches coach, how many competitive events they have coached MAs at, and the level of competition they coach (e.g., international, regional, etc.) as potential covariates. For the MAs' data, we tested age, gender, ethnicity, level of education, country of residence, primary sport, how many months per year/times per week/hours per week the MAs participate in sport, how many times per week a coach is on-site for training, how many competitive events in the past 12 months, level of competition, what age they began participation in adult sport, and how many years they have been involved with their current coach as potential covariates. If in either dataset, when a significant covariate was found, a repeated measure ANCOVA was used to determine if adult-oriented coaching practices changed over time while controlling for the effect of the covariate. In the case where no covariates were identified, a repeated-measures ANOVA was conducted. See Table 1.2 for the coaches' descriptive statistics.

***Does a Change in Adult-Oriented Coaching Practices Promote a Change in Quality Masters Sport Experience Outcomes?***

In the final section, we were interested in whether changes in MAs' perceptions of their coaches' use of adult-oriented coaching practices were related to changes in MAs' QMSE outcomes. To assess change, we calculated change scores by taking the difference between MAs' T2 and T1 scores on all variables of interest (Maxwell & Howard, 1981). Table 1.3 displays descriptive statistics for MAs' change scores for all variables.

Two separate path analyses were conducted. The first path analysis used change scores on *specific* adult-oriented coaching practices (i.e., CIA, FLS, ICK, RPE, CPP) as the independent variables, while the second path analysis used a single change score for *general* adult-oriented coaching practices as the independent variable. In both analyses, change scores for factors of the

CAR (closeness, commitment, and complementarity), MAs' BPN satisfaction (i.e., autonomy IPLOC, autonomy volition, autonomy choice, competence, and relatedness), and MAs' BPN thwarting (i.e., autonomy, competence, and relatedness) acted as the dependent variables.

## Results

The results will be divided into three sections based on our research questions. The first section represents the cross-sectional associations between adult-oriented coaching practices and QMSE outcomes at both time points. The second section presents findings on how adult-oriented coaching practices have changed over time. Finally, the third section presents results on how adult-oriented coaching practices and QMSE outcomes are related over time.

### Are Adult-Oriented Coaching Practices Associated with a Quality Masters Sport Experience?

This section will be divided into two main sections. First, results for the path analyses representing the *specific* adult-oriented coaching practices at T1 and T2 will be presented. Second, results for the path analyses representing *general* adult-oriented coaching practices at T1 and T2 will be presented. Each main section will be further divided based on each QMSE outcome (i.e., CAR, BPN satisfaction, BPN thwarting).

#### *Specific AOSCS Scores*

**Coach-Athlete Relationship.** At T1 (see Figure 1.1), MAs' perceptions of their coaches RPE were positively associated with MAs' feelings of complementarity ($\beta = .387$, $p < .001$) and commitment ($\beta = .358$, $p < .001$). Further, MAs' perceptions of their coaches ICK were positively associated with MAs' feelings of closeness ($\beta = .354$, $p < .001$), commitment ($\beta = .250$, $p = .005$), and complementarity ($\beta = .235$, $p = .006$). The remaining three adult-oriented

coaching practices (i.e., CIA, FLS, and CPP) had no significant associations with CAR variables at T1.

At T2 (see Figure 1.1), MAs' perceptions of their coaches CPP were positively related to MAs' feelings of commitment to the CAR ($\beta$ = .382, $p$ < .001). Further, MAs' perceptions of their coaches RPE were positively associated with MAs' feelings of commitment to the CAR ($\beta$ = .284, $p$ = .014). The remaining adult-oriented coaching practices (i.e., CIA, FLS, and ICK) were not related to closeness and complementarity at T2.

**Basic Needs Satisfaction.** At T1 (see Figure 1.2), MAs' perceptions of their coaches ICK were positively related with MAs' feelings of autonomy volition satisfaction ($\beta$ = .275, $p$ = .013) and MAs' relatedness satisfaction ($\beta$ = .263, $p$ = .005). The remaining AOSCS variables (i.e., CIA, FLS, RPE, and CPP) were not related to autonomy IPLOC, autonomy choice, and competence at T1.

At T2 (see Figure 1.2), MAs' perceptions of their coaches CPP were positively associated with MAs' feelings of autonomy IPLOC satisfaction ($\beta$ = .595, $p$ < .001), relatedness satisfaction ($\beta$ = .342, $p$ = .011), and autonomy choice satisfaction ($\beta$ = .296, $p$ = .024). Additionally, MAs' perceptions of their coaches RPE were positively associated with MAs' feelings of competence ($\beta$ = .330, $p$ = .019) and autonomy choice ($\beta$ = .302, $p$ = .009) satisfaction. Negative relationships were observed between MAs' perceptions of their coaches FLS and MAs' feelings of autonomy IPLOC ($\beta$ = -.460, $p$ < .001), autonomy choice ($\beta$ = -.424, $p$ = .001), relatedness ($\beta$ = -.337, $p$ = .008), and competence ($\beta$ = -.267, $p$ = .012) satisfaction. The remaining adult-oriented coaching practices (i.e., CIA and ICK) were not related to autonomy volition at T2.

**Basic Needs Thwarting.** At T1 (see Figure 1.3), MAs' perceptions of their coaches RPE were negatively associated with MAs' feelings of competence ($\beta$ = -.386, $p$ = .014), relatedness

($\beta$ = -.377, $p$ = .003), and autonomy ($\beta$ = -.320, $p$ = .020). No other associations were found at T1 for the remaining AOSCS variables (i.e., CIA, FLS, ICK, and CPP).

At T2 (see Figure 1.3), MAs' perceptions of their coaches CPP were positively associated with MAs' feelings of relatedness thwarting ($\beta$ = .376, $p$ = .016). Further, MAs' perceptions of their coaches FLS were positively associated with MAs' feelings of competence ($\beta$ = .296, $p$ = .017) and autonomy ($\beta$ = .250, $p$ = .044) thwarting. The remaining AOSCS variables (i.e., CIA, ICK, and RPE) were not related to MAs' BPN thwarting at T2.

***General AOSCS Scores***

**Coach-Athlete Relationship.** At T1 and T2, MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices (Figure 1.4) were positively related with commitment (T1: $\beta$ = .622, $p$ < .001; T2: $\beta$ = .681, $p$ < .001), complementarity (T1: $\beta$ = .526, $p$ < .001; T2: $\beta$ = .573, $p$ < .001), and closeness (T1: $\beta$ = .513, $p$ < .001; T2: $\beta$ = .554, $p$ < .001).

**Basic Psychological Needs.** At both time points, MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices (see Figure 1.4) were associated with MAs' feelings of autonomy choice (T1: $\beta$ = .449, $p$ < .001; T2: $\beta$ = .495, $p$ < .001), competence (T1: $\beta$ = .439, $p$ < .001; T2: $\beta$ = .348, $p$ < .001), relatedness (T1: $\beta$ = .434, $p$ < .001; T2: $\beta$ = .529, $p$ < .001), autonomy IPLOC (T1: $\beta$ = .383, $p$ < .001; T2: $\beta$ = .419, $p$ < .001), and autonomy volition (T1: $\beta$ = .356, $p$ < .001; T2: $\beta$ = .486, $p$ < .001) satisfaction.

**Basic Needs Thwarting.** At T1, MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices (see Figure 1.4) were negatively associated with MAs' feelings of competence ($\beta$ = -.241, $p$ = .022) and relatedness thwarting ($\beta$ = -.142, $p$ = .046). MAs' feelings of autonomy thwarting were not related to adult-oriented coaching practices at T1. At T2, MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices were negatively

related to MAs' feelings of autonomy ($\beta$ = -.241, $p$ = .007) and relatedness thwarting ($\beta$ = -.142, $p$ = .042), while MAs' feelings of competence thwarting were not related to the coaches' *general* use of adult-oriented coaching practices.

**Do Adult-Oriented Coaching Practices Change Over Time?**

This section will be divided into two sections. First, we present findings on how coaches' perceptions of their use of adult-oriented coaching practices have changed over time. Second, we present findings on how MAs' perceptions of their coaches' use of adult-oriented coaching practices have changed over time.

***Coaches***

The bivariate correlation analysis showed that the coaches' country of residence was significantly related to ICK ($r$ = -.410, $p$ = .020) and that the coaches' gender, and the hours per week coaches they spent coaching, were significantly related to FLS ($r$ = -.355, $p$ = .046 and $r$ = .358, $p$ = .048, respectively). Therefore, repeated measures ANCOVAs were conducted to determine if ICK and FLS changed significantly over time while controlling for their respective covariates. No significant covariates were found for the remaining AOSCS variables (i.e., CIA, RPE, CPP, and *general*). Therefore, repeated measures ANOVAs were used in these cases.

The first repeated measures ANCOVA showed that the coaches use of framing learning situations (FLS) changed significantly over time ($F$(1,28) = 10.166, $p$ = 0.004, $\eta_p^2$ = .266; $M_{T1}$ = 31.17, $M_{T2}$ = 31.06), while controlling for the effects of gender, and the hours per week coaches they spent coaching. The second repeated measure ANCOVA, testing changes in ICK over time while controlling for the coaches' country of residence, was non-significant. There were no covariates identified for all remaining AOSCS variables (i.e., CIA, ICK, RPE, CPP, *general*).

Thus, repeated measures ANOVAs were conducted. The results showed no significant changes over time for the remaining adult-oriented coaching variables.

***MAs***

Significant bivariate correlations existed between MAs' times per week participating and FLS ($r$ = .259, $p$ = .008), AOSCS *general* scores ($r$ = .235, $p$ = .017), and CIA ($r$ = .230, $p$ = .020). MAs' years with their current coach was significantly correlated with RPE ($r$ = -.252, $p$ = .010), CPP ($r$ = -.217, $p$ = .028), and AOSCS *general* scores ($r$ = -.201, $p$ = .043). Therefore, repeated measure ANCOVAs were used to determine how CIA, FLS, RPE, CPP, and *general* AOSCS scores changed over time while controlling for their respective covariates. The first repeated measures ANCOVA showed that MAs' *general* perceptions of their coaches' use of adult-oriented coaching practices changed over time ($M_{T1}$ = 108.09, $M_{T2}$ = 109.40) when controlling for the number of years MAs have been with their current coach, $F(1,99) = 6.605$, $p$ = 0.012, $\eta_p^2 = .063$. The remaining repeated measures ANCOVAs showed no significant changes in time for CIA, FLS, RPE, and CPP. Likewise, the remaining repeated measures ANOVA for ICK showed no significant change over time.

**Does a Change in Adult-Oriented Coaching Practices Promote a Change in Quality Masters Sport Experience Outcomes?**

Two individual path analyses were performed to test the associations between change scores on MAs' perceptions of their coaches' use of adult-oriented coaching practices and change scores on MAs' QMSE outcomes. First, we present findings on the associations between change scores on *specific* adult-oriented coaching practices (Figure 5) and QMSE outcomes. Second, we present findings on the relationships between the *general* use of adult-oriented

coaching practices (Figure 6) and QMSE outcomes. In this section, the results will be divided based on each QMSE outcome (i.e., CAR, BPN satisfaction, BPN thwarting).

***Specific AOSCS Change***

**Coach-Athlete Relationship.** Changes in MAs' perceptions of their coaches' FLS were significantly and positively related to changes in MAs' feelings of commitment ($\beta$ = .273, $p$ < .001) and closeness ($\beta$ = .244, $p$ = .003) in the CAR. Changes in MAs' perceptions of their coaches CIA were positively associated with changes in MAs' feelings of complementarity ($\beta$ = .218, $p$ = .004). Changes in MAs' perceptions of their coaches CPP were positively related to changes in MAs' feelings of closeness in the CAR ($\beta$ = .211, $p$ = .006). Finally, changes in MAs' perceptions of their coaches RPE and ICK were positively related to changes in MAs' commitment to the CAR ($\beta$ = .196, $p$ = .003 and $\beta$ = .169, $p$ = .034, respectively).

**Basic Needs Satisfaction.** Changes in MAs' perceptions of their coaches CPP were positively related to changes in MAs' feelings of relatedness ($\beta$ = .363, $p$ < .001) and autonomy volition ($\beta$ = .153, $p$ = .029) satisfaction. Changes in MAs' perceptions of their coaches RPE were positively associated with changes in MAs' feelings of autonomy volition ($\beta$ = .259, $p$ = .006), relatedness ($\beta$ = .210, $p$ = 004), and autotomy choice ($\beta$ = .169, $p$ = .014) satisfaction. Changes in CIA, FLS, and ICK were not related to changes in autonomy IPLOC and competence satisfaction.

**Basic Needs Thwarting.** Changes in MAs' perceptions of their coaches RPE were negatively associated with changes in MAs' feelings of competence thwarting ($\beta$ = -.294, $p$ = .001), while changes in MAs' perceptions of their coaches FLS were positively associated with changes in MAs' feelings of competence thwarting ($\beta$ = .183, $p$ = .012). Finally, changes in MAs' perceptions of their coaches ICK were positively associated with changes in MAs'

feelings of autonomy thwarting ($\beta$ = .138, $p$ = .043). Changes in CIA and CPP were not related to relatedness thwarting.

### *General AOSCS Change*

Changes in the MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices were positively related to changes in MAs' feelings of closeness ($\beta$ = .385, $p$ < .001), commitment ($\beta$ = .346, $p$ < .001) and complementarity ($\beta$ = .182, $p$ = .012). Similarly, changes in MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices were positively associated with changes in MAs' BPN satisfaction (relatedness: $\beta$ = .412, $p$ < .001; autonomy choice: $\beta$ = .289, $p$ < .001; autonomy volition: $\beta$ = .237, $p$ = .004; competence: $\beta$ = .205, $p$ = .003; autonomy IPLOC: $\beta$ = .180, $p$ = .004). No significant associations existed between changes in MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices and changes in autonomy, competence, and relatedness thwarting.

## Discussion

In this study, we examined MAs' and their coaches' perceptions of how often coaches use adult-oriented coaching practices at two separate time points in their season. We also assessed how these adult-oriented coaching practices were related to specific outcomes, which can be used to infer a QMSE. These relationships were tested both cross-sectionally and longitudinally.

### *Adult-Oriented Coaching Practices Are Associated with Quality Relationships*

Our data suggest that several relationships exist between adult-oriented coaching practices and quality relationships, and these were relatively consistent across both time points in MAs' sporting seasons. More specifically, when MAs perceived that their coaches used adult-oriented coaching practices more frequently in *general*, they felt closer to their coach (i.e.,

closeness), had greater intentions to maintain their relationship with their coach (i.e., commitment), and were more cooperative with their coach (i.e., complementarity) at both time points. Recent qualitative literature of coached Masters sport gives us an indication of the importance of the CAR for MAs. Ferrari et al. (2016) noted that MAs' CAR was paramount for their sport enjoyment, overall well-being, and resulted in general social, health, and performance benefits. Currie (2019) found that MAs and their coach actively engage in closeness, commitment, and complementarity across the season to create a higher QMSE for the individual MAs, as well as the group.

We also tested the relationship between *specific* adult-oriented coaching practices and the CAR. At the first time point, we found that when coaches impart their coaching knowledge (ICK), their MAs felt closer to their coach, more committed to their coach, and were more cooperative with their coach. Thus, when coaches tell their MAs about themselves, the coaches are sharing what they have learned and are showing vulnerability that they are also still learning, this creates a better CAR. When the coach communicates with their athletes about who they are, this is essential to trusting and respecting the coach (Jowett, 2007). When done early in the season, this may be substantial beneficial. Further, our results at T2 show that when coaches created personalized programming (CPP) and respected their MAs' preferences in terms of accountability, effort, and feedback (RPE), the MAs were more committed to their coach. This makes sense, as eight weeks into a season, MAs would appreciate how their coaches are working with them. This finding also corroborates Young and colleagues' (2014) call to implement strategies to tailor the sports environment to fulfill MAs' opportunities for involvement and to heighten their commitment.

### *Adult-Oriented Coaching Practices Are Associated with Feelings of Validation, Empowerment, and Mastery*

Our findings also provided information as it pertains to the relationships between adult-oriented coaching practices and MAs' BPN at both time points. At both time points, when coaches used *general* adult-oriented coaching practices more often, their MAs were more likely to believe they could make their own choice, feel unpressured to perform actions, and perceived that their choices were coming from their forces (i.e., autonomy satisfaction), as well as feeling more effective in their sport environment (i.e., competence satisfaction), and more connected to others (i.e., relatedness satisfaction). These outcomes match QMSE aspects of empowerment, mastery, and validation as described by Young et al. (2021). Other research has shown that BPN satisfaction is positively related to athlete engagement (De Francisco et al., 2018; Jowett et al., 2016), psychological well-being (Goulimaris et al., 2014), prosocial behaviours (Hodge & Gucciardi, 2015), self-determination (Ahmadi et al., 2012), and positive affect (Alcaraz et al., 2015).

Coaches' *general* use of adult-oriented coaching practices was also negatively linked to MAs' autonomy- (T2), competence- (T1), and relatedness-thwarting (T1 and T2). This suggests that earlier in the season, the coaches' use of adult-oriented coaching practices can help make MAs feel less frustrated with their competencies and less frustrated with their sense of belongingness. Thus, coaches using adult-oriented coaching practices in *general* may facilitate collaboration amongst other athletes, which supports Chu and Zhang's (2019) notion that coaches are responsible for increases in feelings of belongingness and competence in the sport setting. Later in the season, the coaches' use of adult-oriented coaching practices can help MAs feel less frustrated about their autonomy (i.e., sufficient autonomous opportunities) and once

again, make their MAs less frustrated with their sense of belongingness. Like Hoffmann and colleagues' (2019) study, our findings reinforce the notion that coaches can help MAs lower their feelings of relatedness frustration; however, we add to this literature by showing that the coaches' *general* use of adult-oriented coaching practices may be the culprit for lowering MAs' relatedness frustrations across the season (i.e., associations between MAs' perceptions of their coaches' general use of adult-oriented coaching practices and MAs' relatedness satisfaction at both time points and a negative relationship with relatedness thwarting at time one). Hoffmann's study also showed that coached MAs have higher levels of autotomy frustration compared to non-coached MAs. However, Chu and Zhang (2019), reviewing studies mainly from youth sport settings, suggested that coaches have a large influence on their athletes' perceptions of autonomy. Since we know that adult athletes have a strong need for autonomy in learning (Callary et al., 2015; MacLellan et al., 2018), coaches for MAs must be particularly aware of how they provide autonomy support. Thus, our study adds to these findings to indicate that coaches who use all the adult-oriented coaching practices in general across the season may lessen MAs' frustrations regarding their sense of autonomy

We also tested the associations between *specific* adult-oriented coaching practices and MAs' BPN. At the start of the season, when coaches imparted coaching knowledge (ICK) more often, MAs had increased levels of autonomy and relatedness satisfaction (T1). This finding supports the notion that a coach should share their knowledge to foster self-determination and empower MAs (Callary et al., 2015). Further, when coaches respected their athletes' preferences for effort, accountability, and feedback (RPE) more often, MAs had lower levels of autonomy-, competence-, and relatedness-thwarting (T1), as well as higher levels of competence satisfaction (T2). Indeed, Kowal and Fortier (2000) suggested that MAs need to learn, refine, and master

skills (i.e., competence). Thus, when coaches respect MAs' preferences right at the start of the season and continue to cultivate that approach throughout the season, this can create a quality situation in which MAs can experience mastery.

Further, when coaches created personalized programming (CPP) more often, their MAs showed higher levels of autonomy and relatedness satisfaction (T2) but also showed higher levels of relatedness thwarting (T2). MAs have expressed their need for autonomy in training (MacLellan et al., 2019) but also their need for belonging inside and outside of sport (Hodge et al., 2008). Thus, after eight weeks in a program, MAs found that a personalized program satisfied these needs, even if their relatedness was no longer growing. It could be that a personalized program allows MAs to train independently of one another, promoting isolation. This finding requires further investigation. Finally, when coaches more often framed learning situations (FLS), MAs felt lower levels of autonomy and competence satisfaction (T2) and increased levels of competence and autonomy thwarting (T2). While this appears negative, it also makes sense since coaches sometimes make hard decisions around training that MAs may not always like. More specifically, coaches may frame learning through problems, self-discovery, and modelling, in which their MAs may feel the learning challenges them, tests their competencies and may require additional guidance/instructions (i.e., less autonomy) because the coach may be more involved. This can be evidenced by some of the items within the framing learning situation's theme (i.e., "exposing to higher-skilled peers, competitors, or role models" and "relate my training to concerns inside/outside of sport"). Although these findings seem negative, they align with previous literature where coaches purposefully challenged their MAs to push them to learn more, perform, and set/attain goals (Callary et al., 2015). Thus, later in the season, the coaches' use of *specific* adult-oriented coaching practices (CPP and FLS) may seem

unfavourable. However, coaches may, after having set the foundations of a close and trusting relationship earlier in the season be making unpopular training decisions to push MAs' potential in terms of mastery and performance by providing meaningful competition and ensuring MAs are testing and assessing themselves. These findings make sense in terms of Bain's (2019) study, where an athlete described his need to self-assess his skills later in the season. Taken together, the findings suggest that a coach and an adult athlete each play a role in managing the athlete's BPN at different times during the season.

According to Ryan and Deci (2017), BPN are universally important across developmental periods. However, research involving BPN in sports had predominantly focused on recreational, youth, and elite cohorts and BPN research in adult sport is limited. Thus, these findings advance the understanding of BPN in coached adult and older adult competitive contexts. Our results indicate how adult-oriented coaching practices can improve MAs' sport experience overall if they are used *generally*. Further, we showed that *specific* adult-oriented coaching practices can both be beneficial and detrimental (i.e., BPN thwarting) depending on the time point they are used during the season.

### *Adult-Oriented Coaching Practices Do Not Change Naturally Over Time*

Overall, the AOSCS remained relatively stable throughout the Masters sporting seasons when considering both the MAs' and coaches' perceptions, with two exceptions. First, coaches perceived that framing learning situations (FLS) decreased over the season (i.e., 8 weeks) when controlling for gender and the hours per week they spent coaching. This could be a result of the small sample of coaches included in this study or the wide array of sports they coach. Second, MAs perceived that their coaches' use of AOSCS practices, in *general*, increased over the season when controlling for the number of years MAs have been with their coach. We speculate that

coaches who have spent more time with their MAs will be more knowledgeable regarding their MAs' specific coaching preferences and needs. Consequently, a newer coach might use the season to learn and adapt to their MAs' coaching preferences. Callary et al. (2018) indicated that coaches learn adult-oriented coaching primarily through the experience of coaching their MAs and thus, we see an increase of adult-oriented coaching practices over the season, as coaches develop an understanding of what their MAs may want and need from them. However, without intervention, our findings show that the coaches' use of adult-oriented coaching practices does not significantly change over time. Thus, these findings provide initial evidence for the utility of creating coach education interventions that help coaches to work on using the AOSCS practices in *general* or to focus on *specific* factors to work on specified weaknesses or challenges. Considering the ongoing call for more research on theory-based intervention studies in sport psychology (Langan et al., 2013), the current study suggests that such interventions would benefit from focusing on coach education that targets adult-oriented coaching practices. Future research could use the AOSCS to determine the effects that manipulated changes in coaching practices can have on the quality of MAs' sporting experience.

## Limitations and Future Directions

Due to the small sample sizes of coaches and MAs, factor scores were used for the measured constructs in all the path analyses (i.e., the sum of the item scores for each factor and participant). This decision is acceptable given the small samples and complexity of the models (Devlieger & Rosseel, 2017). However, because factor scores were used instead of a complete measurement model (i.e., structural equation modelling), we could not calculate model fit indices, and instead had to assume perfect model fit (i.e., a just-identified model).

Another limitation was that the current study took place during the COVID-19 pandemic, which may have impacted our study in several ways. First, many sports and sports facilities were shut down while we were collecting data. For this reason, we attempted to finish data collection at a quicker pace. This resulted in some participants stopping sport while they were in the middle of our study. Thus, several participants completed the second time point surveys in shorter than 8 weeks. To mitigate this limitation, we cautiously removed a small number of participants and were able to minimize the impact of the pandemic on our data collection.

The COVID-19 pandemic may have also attributed to our high attrition rates in this study. To account for this, we sent out two links (on March 18th and 25th, 2020, respectively) asking for participants to complete the second phase of the study. On the other hand, another possible explanation for our high attrition rates was that MAs who dropped out of the study may have had an ineffective coaching figure, currently or previously in their sport experience, and were thus left with feelings of coaches who did not fulfil their needs as MAs. Future studies may wish to explore the concept of effective and ineffective coaching within the Masters context to better understand how coaches may not be fulfilling MAs' needs.

## Conclusion

The results of this study provide valuable evidence to support the use of adult-oriented coaching practices with MAs. Specifically, adult-oriented coaching practices are related to QMSE, and, in this study, we showed their relationships to quality CAR, mastery, feelings of validation, and empowerment by way of positive influences on constructs of the CART-Q (Jowett & Ntoumanis, 2004), BNSSS (Ng et al., 2011), and PNTS (Bartholomew et al., 2011). Further, the AOSCS showed stability throughout the season (i.e., 8 weeks) for coaches and MAs, resulting in minimal changes in coaching behaviours over time. Finally, without intervention, the

subtle changes in adult-oriented coaching practices were associated with changes in positive QMSE outcomes. Overall, this study highlights the use of the AOSCS as a novel and beneficial tool for MAs and their coaches. Given the results of this project, we challenge researchers and policymakers to re-examine considerations and developmental strategies for coaching middle-aged and older adult athletes beyond traditionally prescribed pedagogical practices.

## Tables and Figures

**Table 1.1** Descriptive statistics of Masters Athletes independent and dependent variables (summed factor scores for adult-oriented coaching practices and quality Masters sport experience outcomes, respectively).

| | | Mean | | | Skewness | | Kurtosis | | Mean | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Statistic | SE | SD | Statistic | SE | Statistic | SE | Statistic | SE | SD | Statistic | SE | Statistic | SE |
| | | Time 1 | | | | | | | Time 2 | | | | | | |
| *AOSCS* | CIA | 20.208 | 0.546 | 5.537 | -0.938 | 0.238 | 0.540 | 0.472 | 20.184 | 0.538 | 5.457 | -0.662 | 0.238 | -0.120 | 0.472 |
| | FLS | 32.460 | 0.700 | 7.106 | -0.032 | 0.238 | -0.719 | 0.472 | 33.109 | 0.850 | 8.622 | -0.377 | 0.238 | -0.056 | 0.472 |
| | ICK | 16.369 | 0.364 | 3.692 | -0.833 | 0.238 | 0.663 | 0.472 | 16.019 | 0.399 | 4.054 | -0.702 | 0.238 | 0.120 | 0.472 |
| | RPE | 16.214 | 0.379 | 3.849 | -0.673 | 0.238 | -0.286 | 0.472 | 16.379 | 0.362 | 3.673 | -0.746 | 0.238 | 0.195 | 0.472 |
| | CPP | 22.835 | 0.765 | 7.768 | -0.382 | 0.238 | -0.743 | 0.472 | 23.705 | 0.730 | 7.410 | -0.517 | 0.238 | -0.310 | 0.472 |
| | AOSCS *General** | 108.085 | 2.310 | 23.442 | -0.557 | 0.238 | -0.092 | 0.472 | 109.396 | 2.508 | 25.451 | -0.538 | 0.238 | -0.048 | 0.472 |
| *CART-Q* | Commitment | 17.621 | 0.323 | 3.277 | -1.221 | 0.238 | 1.932 | 0.472 | 17.695 | 0.325 | 3.295 | -1.273 | 0.238 | 1.723 | 0.472 |
| | Closeness | 26.361 | 0.253 | 2.571 | -1.792 | 0.238 | 2.516 | 0.472 | 26.365 | 0.270 | 2.743 | -2.591 | 0.238 | 9.339 | 0.472 |
| | Complementarity | 25.874 | 0.307 | 3.111 | -2.306 | 0.238 | 8.029 | 0.472 | 25.990 | 0.293 | 2.975 | -1.887 | 0.238 | 4.058 | 0.472 |
| *BNSSS* | Relatedness | 29.233 | 0.419 | 4.257 | -0.627 | 0.238 | 0.060 | 0.472 | 28.806 | 0.405 | 4.107 | -0.524 | 0.238 | -0.171 | 0.472 |
| | Autonomy IPLOC | 18.181 | 0.216 | 2.197 | -0.324 | 0.238 | -0.692 | 0.472 | 17.926 | 0.231 | 2.346 | -0.507 | 0.238 | -0.467 | 0.472 |
| | Autonomy Volition | 12.287 | 0.235 | 2.385 | -0.024 | 0.238 | 1.131 | 0.472 | 12.478 | 0.250 | 2.536 | -0.019 | 0.238 | 1.188 | 0.472 |
| | Autonomy Choice | 23.891 | 0.281 | 2.856 | -0.304 | 0.238 | -0.483 | 0.472 | 23.487 | 0.311 | 3.161 | -0.598 | 0.238 | 0.103 | 0.472 |
| | Competence | 31.674 | 0.369 | 3.742 | -1.600 | 0.238 | 3.412 | 0.472 | 31.346 | 0.345 | 3.503 | -1.031 | 0.238 | 0.903 | 0.472 |
| *PNTS* | Autonomy | 6.214 | 0.324 | 3.286 | 1.518 | 0.238 | 1.250 | 0.472 | 6.243 | 0.316 | 3.204 | 1.961 | 0.238 | 4.138 | 0.472 |
| | Competence | 5.181 | 0.209 | 2.119 | 2.036 | 0.238 | 3.757 | 0.472 | 5.062 | 0.198 | 2.009 | 2.635 | 0.238 | 8.481 | 0.472 |
| | Relatedness | 5.249 | 0.228 | 2.315 | 2.216 | 0.238 | 4.512 | 0.472 | 5.272 | 0.239 | 2.430 | 2.363 | 0.238 | 5.482 | 0.472 |

***Note:*** *Signifies variables that significantly changed over time. AOSCS = Adult-Oriented Sport Coaching Survey; CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge;

RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = single item "Because of my coach, I like to go to practice"; BC2 = single item "Because of my coach, I want to invest more in my sport"; SC = single item "I am committed to keep doing my sport"; SE = single item "I find participating in sport to be very enjoyable"; AOSCS General = *general* adult-oriented coaching practice scores. Potential scale ranges (summed item responses using a 7-point Likert Scale responses): CIA = 4-28; FLS = 7-49; ICK = 3-21; RPE = 3-21; CPP = 5-35; AOSCS General = 22-154; Commitment = 3-21; Closeness = 4-28; Complementarity = 4-28; Relatedness = 5-35; Autonomy IPLOC = 3-21; Autonomy Volition = 3-21; Autonomy Choice = 4-28; Competence = 5-35; Autonomy Thwarting = 4-28; Competence Thwarting = 4-28; Relatedness Thwarting = 4-28.

**Table 1.2** Descriptive statistics of coach independent variables (summed factor scores for adult-oriented coaching practices).

| | Mean | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|
| | Statistic | SE | SD | Statistic | SE | Statistic | SE |
| | | | Time 1 | | | | |
| CIA | 21.938 | 0.892 | 5.048 | -1.486 | 0.414 | 2.320 | 0.809 |
| FLS | 31.174 | 1.414 | 8.000 | -0.310 | 0.414 | -0.295 | 0.809 |
| ICK | 16.156 | 0.586 | 3.313 | -1.197 | 0.414 | 2.378 | 0.809 |
| RPE | 16.454 | 0.576 | 3.261 | -1.012 | 0.414 | 2.001 | 0.809 |
| CPP | 25.189 | 1.436 | 8.122 | -0.951 | 0.414 | 0.403 | 0.809 |
| AOSCS General | 110.910 | 4.020 | 22.740 | -1.051 | 0.414 | 1.200 | 0.809 |
| | | | Time 2 | | | | |
| CIA | 21.500 | 0.853 | 4.826 | -1.514 | 0.414 | 4.299 | 0.809 |
| FLS* | 31.064 | 1.305 | 7.383 | 0.068 | 0.414 | -0.619 | 0.809 |
| ICK | 16.063 | 0.483 | 2.735 | -0.292 | 0.414 | 0.352 | 0.809 |
| RPE | 16.508 | 0.570 | 3.224 | -1.391 | 0.414 | 2.861 | 0.809 |
| CPP | 25.973 | 1.291 | 7.302 | -1.492 | 0.414 | 2.030 | 0.809 |
| AOSCS General | 111.107 | 3.763 | 21.288 | -1.025 | 0.414 | 2.804 | 0.809 |

***Note:*** ******** Signifies variables that significantly changed over time. AOSCS = Adult-Oriented Sport Coaching Survey; CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; AOSCS General = *general* adult-oriented coaching practice scores. Potential scale ranges (summed item responses using a 7-point Likert Scale responses): CIA = 4-28; FLS = 7-49; ICK = 3-21; RPE = 3-21; CPP = 5-35; AOSCS General = 22-154.

**Table 1.3** Descriptive statistics of Masters Athletes' change scores on independent and dependent variables (adult-oriented coaching practices and quality Masters sport experience outcomes, respectively). Change scores were calculated by taking the absolute difference between Time 2 and Time 1 summed factor scores for all variables of interest.

| | | Mean | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|
| | | Statistic | SE | SD | Statistic | SE | Statistic | SE |
| *AOSCS* | CIA | -.023 | .418 | 4.237 | -.022 | .238 | .558 | .472 |
| | FLS | .649 | .640 | 6.498 | .361 | .238 | 1.863 | .472 |
| | ICK | -.350 | .351 | 3.566 | -.438 | .238 | 1.195 | .472 |
| | RPE | .165 | .260 | 2.640 | .069 | .238 | 1.240 | .472 |
| | CPP | .870 | .563 | 5.715 | .573 | .238 | 1.587 | .472 |
| | AOSCS | 1.311 | 1.481 | 15.032 | .300 | .238 | 1.918 | .472 |
| *CART-Q* | Commitment | .074 | .227 | 2.303 | .731 | .238 | 1.305 | .472 |
| | Closeness | .004 | .189 | 1.922 | -.093 | .238 | 2.739 | .472 |
| | Complementarity | .117 | .211 | 2.139 | -.240 | .238 | 2.437 | .472 |
| *BNSSS* | Relatedness | -.427 | .378 | 3.836 | .629 | .238 | 2.549 | .472 |
| | Autonomy IPLOC | -.254 | .203 | 2.061 | .378 | .238 | 2.505 | .472 |
| | Autonomy Volition | .190 | .303 | 3.078 | -.033 | .238 | 2.212 | .472 |
| | Autonomy Choice | -.404 | .266 | 2.704 | -.514 | .238 | 1.509 | .472 |
| | Competence | -.328 | .323 | 3.278 | .222 | .238 | .961 | .472 |
| *PNTS* | Autonomy | .029 | .307 | 3.117 | .557 | .238 | 5.859 | .472 |
| | Competence | -.118 | .200 | 2.034 | -.312 | .238 | 3.988 | .472 |
| | Relatedness | .023 | .199 | 2.021 | .826 | .238 | 6.355 | .472 |

***Note:*** AOSCS = Adult-Oriented Sport Coaching Survey; CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; AOSCS General = *general* adult-oriented coaching practice scores. Potential difference score ranges (difference between coach and athletes' scores on summed item responses using a 7-point Likert Scale responses): CIA = 0-24; FLS = 0-42; ICK = 0-18; RPE = 0-18; CPP = 0-30; AOSCS General = 0-132; Commitment = 0-18; Closeness = 0-24; Complementarity = 0-24; Relatedness = 0-30; Autonomy IPLOC = 0-18; Autonomy Volition = 0-18; Autonomy Choice = 0-24; Competence = 0-30; Autonomy Thwarting = 0-24; Competence Thwarting = 0-24; Relatedness Thwarting = 0-24.

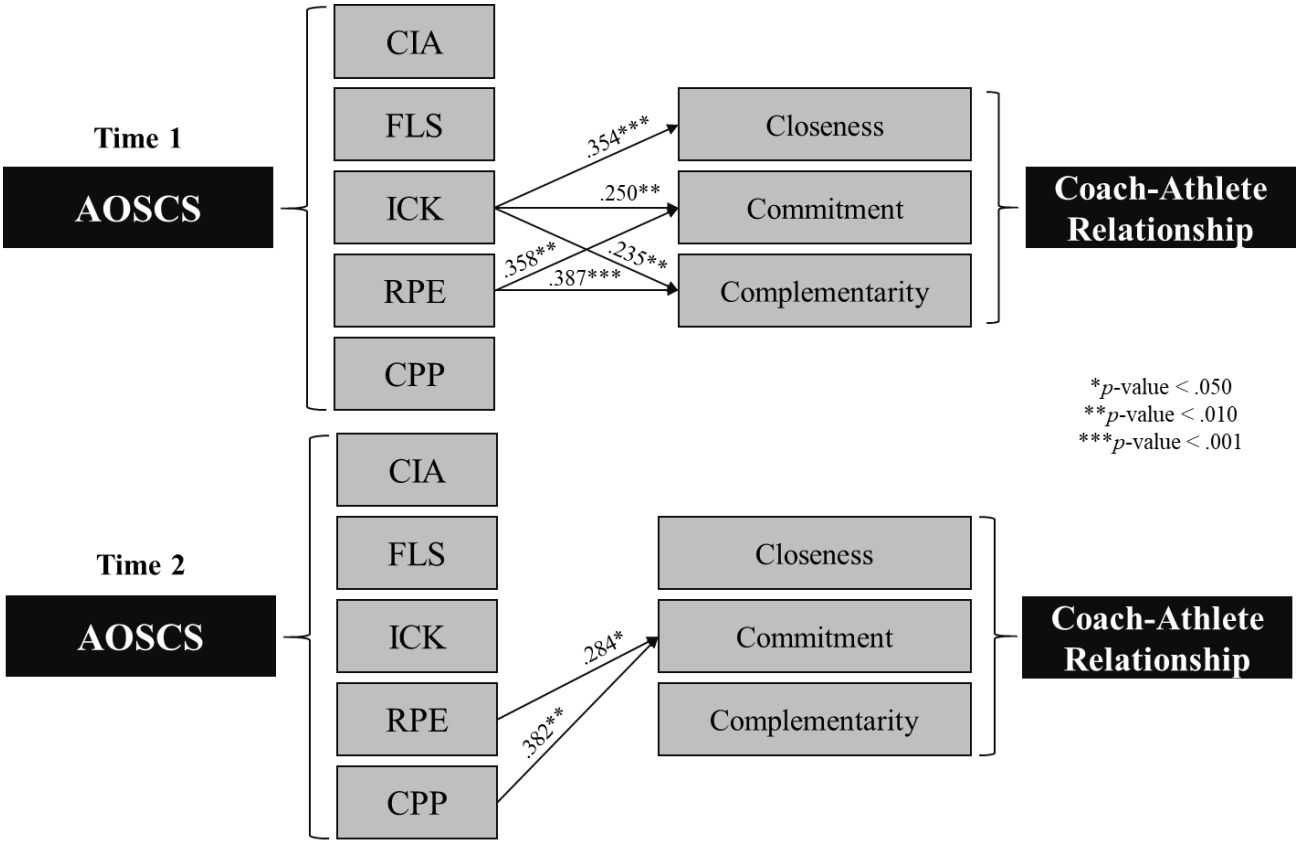


**Figure 1.1** Path analysis results highlighting only the significant relationships (standardized beta coefficients), at both time points, between Masters Athletes' perceptions of their coaches' use of specific adult-oriented coaching practices and coach-athlete relationship variables.
***Note*:** AOSCS = Adult-Oriented Sport Coaching Survey; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming.

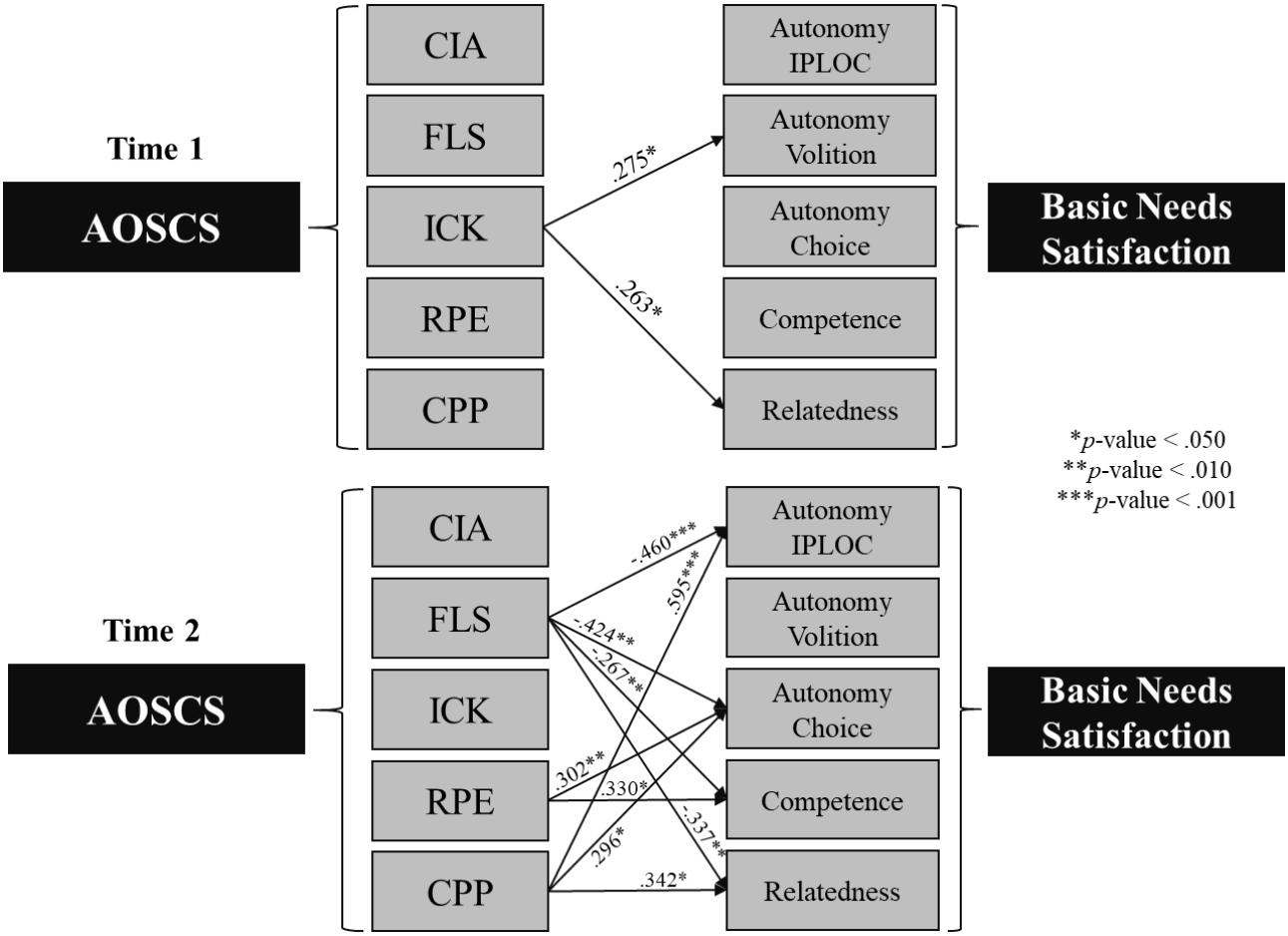


**Figure 1.2** Path analysis results highlighting only the significant relationships (standardized beta coefficients), at both time points, between Masters Athletes' perceptions of their coaches' use of *specific* adult-oriented coaching practices and their basic psychological needs satisfaction.
***Note*:** AOSCS = Adult-Oriented Sport Coaching Survey; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; IPLOC = Internal Perceived Locus of Causality.

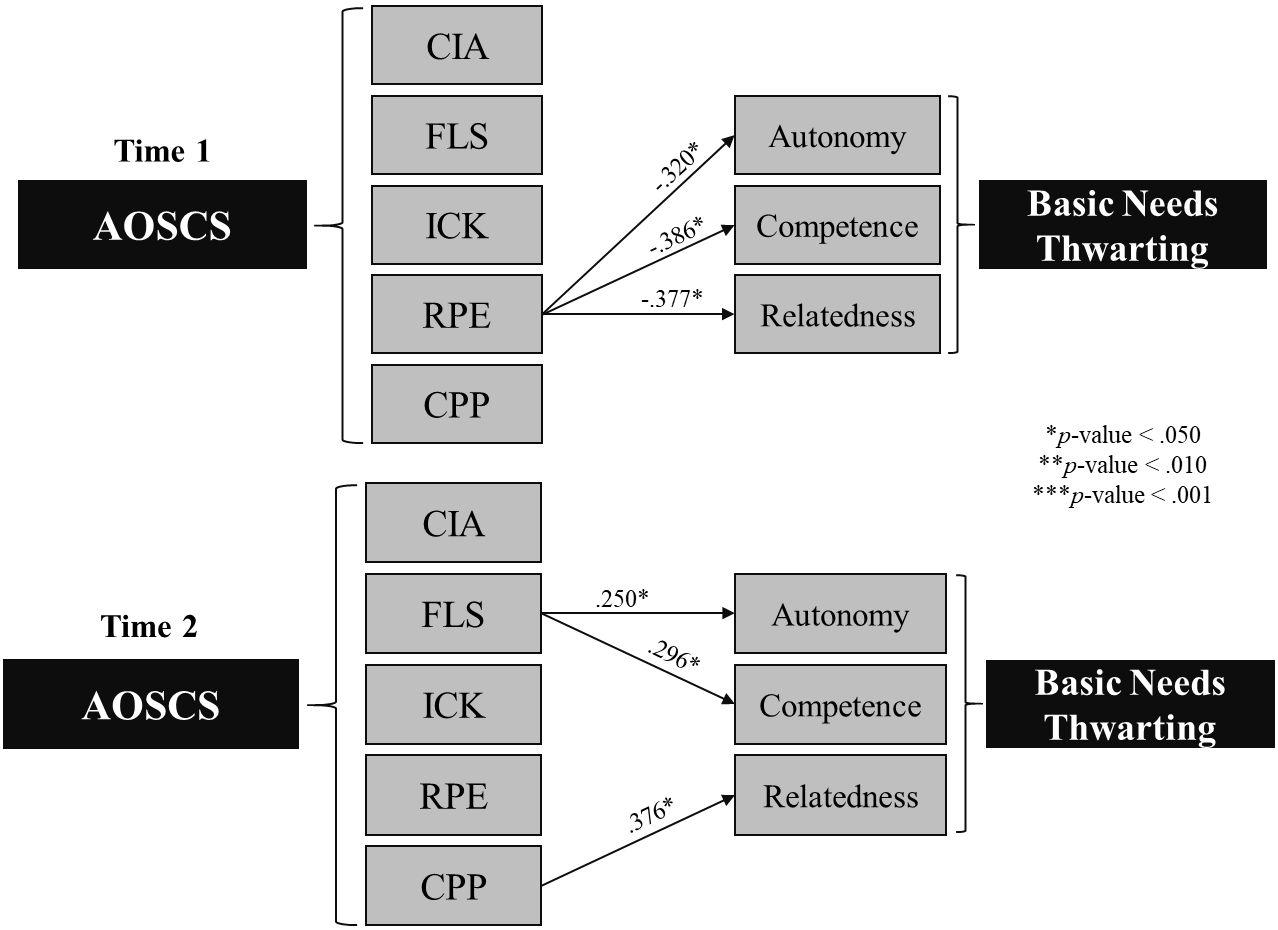


**Figure 1.3** Path analysis results highlighting only the significant relationships (standardized beta coefficients), at both time points, between Masters Athletes' perceptions of their coaches' use of *specific* adult-oriented coaching practices and their basic psychological needs thwarting.
***Note*:** AOSCS = Adult-Oriented Sport Coaching Survey; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming.

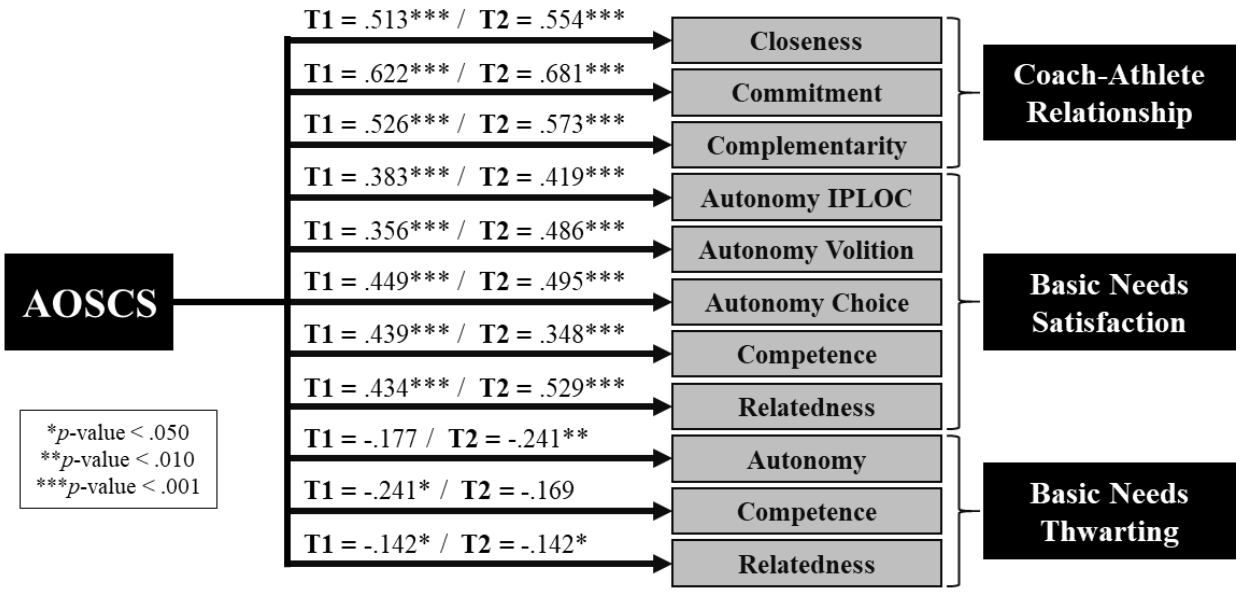


**Figure 1.4** Cross-sectional path analysis results (standardized beta coefficients), at both time points, displaying the relationships between Masters Athletes' perceptions of their coaches' use of *general* adult-oriented coaching practices and quality Masters sport experience outcomes. ***Note*:** AOSCS = Athletes' general adult-oriented coaching practice scores; T1 = data from time one collection point; T2 = data from time two collection point; IPLOC = Internal Perceived Locus of Causality.

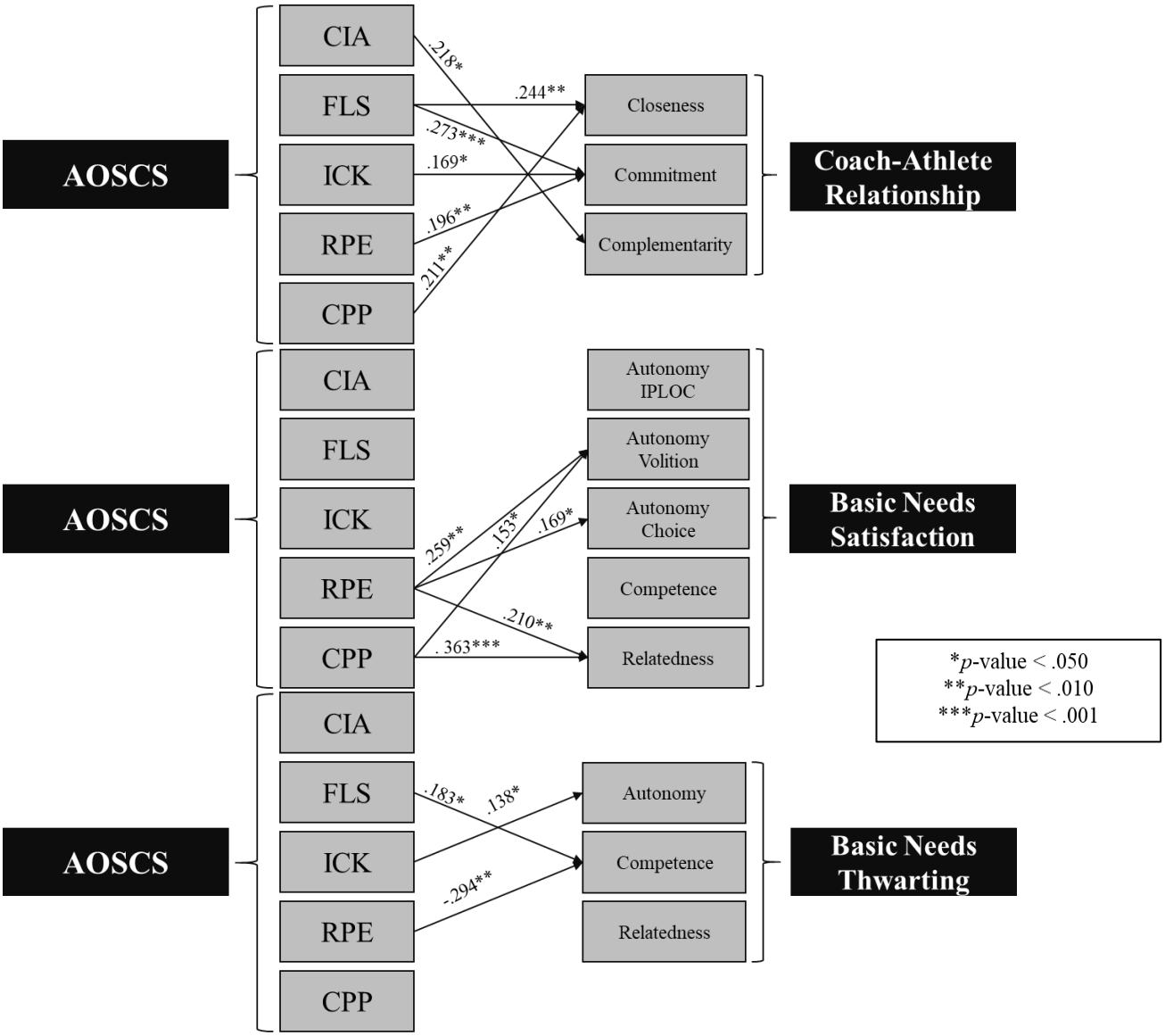


**Figure 1.5** Associations (standardized beta coefficients) between change scores of MAs' perceptions of their coaches' *specific* use of adult-oriented coaching and change scores of quality Masters sport experience outcomes.
***Note*:** CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; IPLOC = Internal Perceived Locus of Causality.

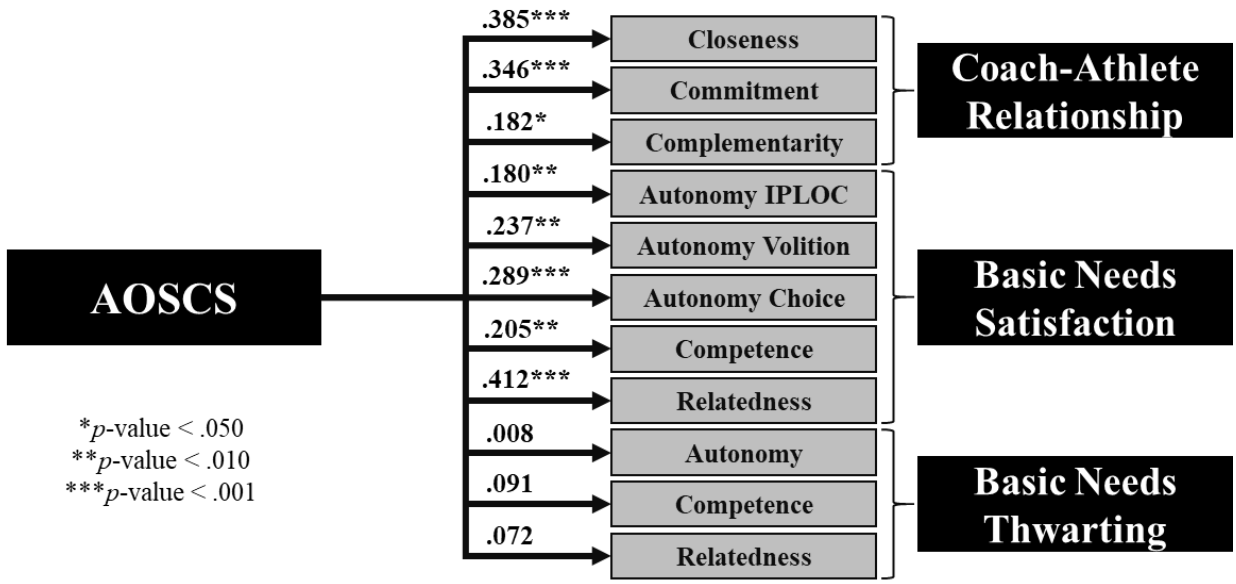


**Figure 1.6** Associations (standardized beta coefficients) between change scores of Masters Athletes' perceptions of their coaches' *general* use of adult-oriented coaching and change scores of quality Masters sport experience outcomes.
***Note*:** AOSCS = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal Perceived Locus of Causality.

## Chapter 3: Congruence and A Quality Masters Sport Experience


### Abstract

Recent qualitative evidence (Callary et al., 2017) suggests that adult-oriented coaching practices may enhance Masters athletes' (MAs) sport experiences. Most cognitively mediated coaching models posit that when athletes' preferences for coaching practices align with the coaching practices used (i.e., congruence), athletes should have more satisfying sport experiences (Smoll et al., 1978). For this reason, the two main purposes of this study are to (a) examine how adult-oriented coaching practices are related to outcomes that infer a quality sport experience for Masters Athletes (MAs), and (b) to explore whether congruence impacts the relationship between adult-oriented coaching practices and a quality Masters sport experience (QMSE). In this study, paired samples of coaches ($n$ = 41) and their MAs ($n$ = 181) completed the Adult-Oriented Sport Coaching Survey (AOSCS; Rathwell et al., 2020) and demographic questions. MAs also completed the Coach-Athlete Relationship Questionnaire (Jowett & Ntoumanis, 2004), the Basic Needs Satisfaction in Sport Scale (Ng et al., 2011), the Psychological Needs Thwarting Scale (Bartholomew et al., 2011) and questions assessing practice-liking, sport commitment, sport investment, and sport enjoyment. Congruence was calculated using difference scores (between coaches' and MAs' perceptions of how often coaches use adult-oriented coaching practices). Results from cross-sectional path analyses showed that congruent adult-oriented coaching practices were positively associated with quality coach-athlete relationships, MAs' basic needs satisfaction, practice-liking, sport investment, and sport enjoyment with small to large effect sizes ($B$ = -.32 to .17; Cohen, 1988). However, results from mediation analyses, with congruence as the mediator, showed that relationships between

coaches' use of adult-oriented coaching practices and MAs' outcomes did not depend on congruence. Our findings suggest that congruence can affect the quality of MAs' sport experiences. The complexities of measuring, calculating, and analyzing congruence around coaching practices in the context of Masters sports are also discussed.

## Coaching Masters Athletes

Until recently, coaching MAs was akin to coaching youth athletes (Coaching Association of Canada, n.d.). However, a growing body of literature has helped develop an understanding of the coaching practices that adult athletes prefer and need (Callary et al., 2020; Callary et al., 2015; Callary et al., 2017, 2018; Callary & Young, 2016; MacLellan et al., 2016; MacLellan et al., 2017, 2019; Rathwell et al., 2015; Young, 2011; Young et al., 2014; Young et al., 2020). More recently, Rathwell et al. (2020) quantitatively identified five adult-oriented coaching practices (i.e., considering the individuality of athletes, framing learning situations, imparting coaching knowledge, creating personalized programming, and respecting preferences for effort, accountability, and feedback) that occur in the Masters sport context. While these practices were derived from qualitative work on what MAs perceived they wanted from their coaches (Callary et al., 2015) and what coaches perceived to be effective with their MAs (Callary et al., 2017, 2018), the studies did not examine whether their MAs' preferences for and the coaches' actual use of adult-oriented coaching practices aligned. Further, the studies did not quantitatively examine if adult-oriented coaching practices could predict outcomes of a QMSE.

### Congruence

One avenue that may provide valuable insight into the effectiveness of coaching practices in adult sport is the concept of congruence. According to Light Shields et al. (1997), congruence in sport can be defined in two separate ways: value and perceptual congruence. Value congruence represents the level of similarity between an athlete's perceptions of leadership behaviours and their preferences for leadership behaviours. Perceptual congruence on the other hand considers how similar athletes and their coaches' perceptions are of coaches' behaviours. For this thesis, I explore the impact of perceptual congruence between MAs' and coaches'

perceptions regarding the coaches' use of adult-oriented coaching practices. More specifically, this study will look at *perceptual congruence* in terms of the level of similarity between MAs' and their coaches' perceptions on how often coaches use adult-oriented coaching practices. Previous literature is particularly important for me to explain why congruence in Master sports should be examined.

From a conceptual level, two models are valuable in helping understand congruence in sport as it pertains to the coach's leadership behaviours. First, Chelladurai (1978) conceptualized the congruency hypothesis, which states that if the coaches' actual behaviours are congruent with the athlete's preferred behaviours, the athlete will be more satisfied. In this case, I did not measure performance, however, satisfaction might be inferred based on the improvement of various quality sport experience outcomes. Thus, I may infer that if athletes' QMSE outcome scores are higher when coaches use adult-oriented coaching practices more often, then athletes prefer these coaching behaviours (i.e., adult-oriented coaching practices).

Typically, the congruency hypothesis has been examined in terms of value congruence (Aoyagi et al., 2008; Chelladurai, 1984; Light Shields et al., 1997; Riemer & Chelladurai, 1995; Riemer & Toon, 2001). Consequently, there have been two studies, to my knowledge, that examine the congruency hypothesis through the lens of perceptual congruence. For instance, Laughlin and Laughlin (1994) examined two samples in terms of perceptual congruence. The first was teachers and their students, while the second was coaches and their athletes. In the first sample, the authors found that when students and teachers had similar perceptions in terms of the teacher's leadership behaviours, the students were evaluated more favourably. In the second sample, coaching effectiveness was deemed to be greater when the coach's and athlete's perceptions, respectively, were more similar in terms of leadership behaviours. In another study,

Light Shields et al. (1997) found that athletes' perceived frequency of leadership behaviours was positively associated with team cohesion. Additionally, Light Shields and colleagues showed that perceptual congruence, as opposed to value congruence, was more strongly related to team cohesion. Thus, taking these results together, in the Masters sport setting we may be able to infer that an increase in the similarity between MAs' and coaches' perceptions of the coaches' use of adult-oriented coaching practices (i.e., perceptual congruence), may lead to positive outcomes for the MAs' sport experiences such as a greater sense of belongingness and higher coach effectiveness.

A second model, which expands on the conceptual notion of value congruence, is Smoll and colleague's (1978) Mediational Model of Leadership. This model noted three elements in terms of congruence: the coach's behaviours, the athlete's perceptions, and recall (of the coach's behaviours), and the athlete's evaluative reactions. The coach's behaviours are the actual behaviours that the coach uses (e.g., adult-oriented coaching practices). The athlete's perceptions and recall are the athlete's perceptions of their coach's behaviours and whether the athlete can recall their coach's behaviours (e.g., their perceptions of how often their coach uses adult-oriented coaching practices). The athlete's evaluative reactions are the athlete's general responses to the entire situation. (e.g., QMSE outcomes). Based on these three elements, Smoll and Smith theorized that the relationship between the coach's behaviours and the athlete's evaluative reactions are mediated by the athlete's perceptions and recall of the coach's behaviours. Although this model represents value congruence, we can infer that MAs' QMSE outcomes, as a function of the coach's use of adult-oriented coaching practices, are influenced by the MAs' perceptions of their coach's behaviours. Thus, if QMSE outcome scores are high, we

should expect that both athletes' and coaches' perceptions of adult-oriented coaching practices should be congruent and high.

Like the congruency hypothesis, Smoll et al.'s (1978) Mediational Model of Leadership has been tested a small number of times to our knowledge (e.g., Smoll & Smith, 1989; Smoll et al., 1978). However, value congruence has historically been studied using data from younger and elite cohorts. For instance, Horne and Carron (1985) studied 77 unique coach-athlete dyads from female intercollegiate teams. Their results showed that when the coach's actual behaviours were more like the athlete's perceptions of their preferred leadership behaviours, the athletes perceived an increase in performance levels. Similarly, Chelladurai (1984) examined 196 varsity athletes and found that athletes perceive more satisfaction with their team's performance when their coaches' training, instruction, and feedback were like the athletes' preferences. Finally, unlike the previously mentioned study, Riemer and Toon (2001) found that elite athlete satisfaction was *not* affected by the congruence between the athletes' perceived and preferred coaching behaviours. Once again, like our inferences regarding Smoll and colleagues (1978) Mediational Model of Leadership, these studies suggest that the level of congruence between coaches' behaviours and athletes' perceptions may impact the quality of athlete's sport experience (whether that is a positive or negative reaction in terms of athlete satisfaction).

Within the Masters context, congruence is important to study for two reasons. First, the heterogeneity of MAs adds various complexities to coaching MAs as compared to coaching youth athletes. Specifically, MAs are unlike other 'typical' athletic cohorts whereby the MAs can vary largely in life experiences (inside and outside of sport), life stages, age, gender, skill levels, and coaching preferences (Callary et al., 2015; Dionigi et al., 2012; Heazlewood et al., 2013; Medic, 2009; Medic et al., 2009; Rathwell et al., 2015; Young et al., 2014). Thus, a coach in the

Masters sport setting must be able to adapt and match each adult athlete's preferences, wants, and needs in terms of coaching behaviours and season-long plans/goals (Callary et al., 2015; MacLellan et al., 2019). This may create problems in terms of the coach's ability to behave in ways that match MAs' preferences when considering that their MAs have many varied interests.

Based on the previous literature, it may be useful for coaches to know whether their perceptions of how frequently they use adult-oriented coaching practices are related to their MAs' perceptions of their behaviours so that they can work towards creating positive outcomes for their athletes. Therefore, I tested the perceptual congruence regarding coaches' use of adult-oriented coaching practices based on how frequently MAs and their coaches perceived their use. To do so, I determine how often: a) coaches perceived their use of adult-oriented coaching practices; b) MAs perceived their coaches to use adult-oriented coaching practices; and c) the congruence, or similarity, between the coaches' and MAs' perceptions of how often adult-oriented coaching practices are used. By measuring congruence in this fashion, I am also able to learn about how congruence impacts outcomes that allow us to make inference about the QMSE.

**Quality Masters Sport Experience (QMSE)**

Young et al. (2021) identified eight hallmarks of a QMSE (i.e., meaningful competition, mastery, testing and assessing oneself, quality relationships, fund and fitness, intellectual stimulation, feeling empowered, and feeling validated). We can explore a QMSE through various positive outcomes of being involved in coached Masters sport participation. Specifically, researchers have highlighted basic psychological needs (BPN; Gayman et al., 2017; MacLellan et al., 2017; Stevenson, 2002), the coach-athlete relationship (CAR; Currie, 2019), sport commitment (Young & Medic, 2011), sport enjoyment (Dionigi, 2002), practice-liking (Ferrari et al., 2016), and sport investment (Santi et al., 2014) as being important outcomes for a QMSE.

However, the literature does not indicate the extent to which coaches may create or maintain these aspects of a QMSE and which adult-oriented practices lead to specific outcomes.

### *Basic Psychological Needs and the Coach-Athlete Relationship*

In Chapter 2, I wrote about the relationships between adult-oriented coaching practices and MAs' outcomes regarding their BPN and the CAR. The results indicate that MAs' perceptions of their coaches' use of adult-oriented coaching practices were positively linked to MAs' BPN satisfaction at two time points during the season. Further, the results showed that changes in MAs' perceptions of their coaches' use of adult-oriented coaching practices were positively associated with changes in MAs' BPN satisfaction over time. The findings from Chapter 1 allow us to infer that coaching practices can directly impact the satisfaction of MAs' BPN, thus resulting in feelings of empowerment, validation, and mastery within the QMSE.

In terms of the CAR, when MAs perceived their coaches to use adult-oriented coaching practices more often, the MAs felt that they trusted and respected their coach more (i.e., closeness), intended to maintain their relationship with their coach longer (i.e., commitment), and were more cooperative in terms of the coach's instructions/practices (i.e., complementarity). These results were consistent across the season. Additionally, changes in MAs' perceptions of their coaches' use of adult-oriented coaching practices were positively associated with changes in MAs' closeness, commitment, and complementarity over time. The results from Chapter 2 add to the literature by showing that a coach's specific behaviours (i.e., adult-oriented coaching practices) can result in a higher quality CAR, thus translating into quality relationships within the QMSE. In sum, MAs' BPN and the CAR are important indicators of QMSE. These outcomes were found to be related to MAs' perceptions of their coaches' use of adult-oriented coaching practices in Chapter 2.

***Commitment and Enjoyment***

Two additional indicators of a QMSE, which were not assessed in Chapter 2, are sport commitment and sport enjoyment. According to the Sport Commitment Model (SCM; Scanlan et al., 1993), s*port commitment* is defined as an athlete's intention to continue to participate in sport. Sport commitment is important for three reasons. First, commitment is an appealing outcome with easy to assess face value (Scanlan et al., 1993). Second, commitment has a substantial theoretical value in sport. For example, sport commitment has been used widely across athletic cohorts to explain personal investments (e.g., time and money; Casper, 2007), enjoyment (Carpenter et al., 1993), increased opportunities such as friendships, travel, skill enhancement, and goal achievement (Alexandris et al., 2002). Finally, commitment is important is because it helps explain persistence in any given behaviours or tasks (e.g., sport; Scanlan et al., 1993), and is an intuitive marker of a quality sport experience. For instance, an athlete would most likely not persist in sport if their experiences were negative. Without sport commitment, there would be no sport experience. Thus, sport commitment was deemed an important outcome of MAs' persistence in the sport experience representing MAs' *feelings* of *validation*.

Regarding *sport enjoyment*, the SCM defines it as the positive emotions (i.e., pleasure, liking, and fun) that arise from participating in the sport experience. Enjoyment is a valuable indicator of a quality sport experience since it is a strong predictor of prolonged sport commitment (Scanlan et al., 1993). Moreover, since we can pinpoint sources of enjoyment (e.g., coaches, teammates, specific skills), this means that we can begin to explain why MAs are enjoying their sport and how it relates to commitment. In Masters sport, it is no secret that enjoyment is an important part of the MAs' sport experience. MAs have repeatedly expressed how much they enjoy sport and how their enjoyment ensures their prolonged sport participation

(Addamo et al., 2012; Dionigi, 2002, 2005, 2006; Grant, 2001; Kolt et al., 2004; Phoenix & Griffin, 2013; Tantrum & Hodge, 1993; Wilson et al., 2004). Taken together, sport enjoyment is an important outcome since it can predict commitment and participation levels. Thus, sport enjoyment was used as an additional outcome to define a QMSE in the current study.

### *Practice-Liking and Sport Investment Because of Coaches*

*Practice-liking* and *sport investment*, which Callary et al. (2015) and Currie (2019) indicated resulted directly from having a coach, are the final two additional indicators of a QMSE. Seminal research by Smoll et al. (1978) theorized that a coach's behaviours are directly related to the athlete's actions. In other words, the coaches' behaviours and practices can influence how athletes feel about the quality of their sport experience (i.e., practice-liking and investment). Smith et al. (1979) later supported their claims by finding that athletes liked their sport and wanted to invest more into their sport because of their coach's behaviours. This is an important finding because it places coaches as central agents in promoting athlete's engagement in practice, and overall investment in sport.

To the best of our knowledge, an athlete liking practice (i.e., *practice-liking*) because of their coach, has not been studied. However, researchers (Smith & Smoll, 1997; Smoll et al., 1993) have shown that if an athlete does not like practice because of the coach, the athlete may be at risk for exiting sport. This is especially important in the Masters sport domain where many adult athletes have alternative obligations outside of sport (i.e., less time for sport), may initiate sport for the first time later in their lives, or have had prolonged absences from sport (Larson et al., 2019; Stevenson, 2002). For this reason, practice-liking will be an additional outcome used in the study in this chapter to help identify if adult-oriented coaching practices are an effective

approach for helping MAs like training. This will shed light on the fun and fitness aspect of a QMSE.

In terms of *sport investment*, MAs have highlighted that the quality coach programming they receive is an essential reason for the time they invest in sport (Callary et al., 2015). MAs perceive that their coach is a vital resource in legitimizing their investments (Rathwell et al., 2015). Further, Rathwell and colleagues (2015) explain that the number of years MAs invest into their sport may act as a valuable personal form of currency, meaning that terminating their investment would be a personal loss to their identity (Wigglesworth et al., 2012; Young et al., 2015). This evidence shows that not only is sport investment important to MAs' identities but that their coach can help legitimize and sustain the MAs' investment efforts. As such, sport investment may play a key role in MAs' feeling validated within the QMSE. Overall, MAs' practice-liking and sport investment, because of their coach, remain as two understudied contributors to the quality of their sport experience. For this reason, practice-liking and sport investment will be additional outcomes that indicate a quality sport experience used in the study in this chapter.

## Purpose

In this chapter, I have three research questions that I wish to address to build upon the results from Chapter 2:

**(1)** Will the associations between adult-oriented coaching practices and MAs' QMSE outcomes found in Chapter One remain consistent when using data from time one only (increasing the sample size due to having less dropout)?

**(2)** Are additional outcomes of a QMSE (i.e., sport commitment, sport enjoyment, practice-liking, and investment) associated with coaches' use of adult-oriented coaching practices?

**(3)** Do the relationships between adult-oriented coaching practices and QMSE outcomes depend on whether adult-oriented coaching practices are perceived in similar frequency by athletes and coaches? (i.e., Will congruence mediate the relationships between adult-oriented coaching practices and QMSE outcomes?)

As it pertains to the above-mentioned research questions, I have four main hypotheses, which are necessary for testing mediation analyses:

***H1:*** Use of adult-oriented coaching practices will be positively related to reports of the CAR, BPN satisfaction, sport commitment, sport enjoyment, practice-liking, and investment, and negatively related to BPN thwarting. ***H2:*** Congruence will be positively associated with reports of the CAR, BPN satisfaction, sport commitment, sport enjoyment, practice-liking, and investment, and negatively related to BPN thwarting. ***H3:*** The relationships between adult-oriented coaching practices and MAs' QMSE outcomes will depend on the level of congruence between coaches' and athletes' perceptions of adult-oriented coaching practices.

## Methods

### *Procedure*

Please see Chapter 2 for recruitment details. Of note, this study is cross-sectional in nature as opposed to the longitudinal methods used in Chapter 2. Additionally, the participants used in this study were also those whose data was used in Chapter 2 analyses, who had completed surveys at the first time point (a subset of the sample from Study 1). However, the sample size in this chapter is larger since the participants in this study did not need to complete the second survey (i.e., less dropout) to be considered for data analyses in this chapter.

### *Participants*

A total of 54 coaches and 281 MAs started the survey of the study, and 49 coaches and 229 MAs completed time one (52 MAs and 10 coaches cut for partial/incomplete surveys). Because I was interested in paired responses from coaches and their MAs, I only considered participants if they had paired data (i.e., a coach with at least one athlete). Thus, 12 MAs and 5 coaches were cut because they did not have paired data. An additional 4 MAs were cut for not providing the information required to pair their data to a coach, while 2 more coaches were cut for having duplicate responses. Finally, 32 MAs were removed not meeting the criteria to be considered MAs in their respective sport. Specifically, 29 MAs were removed for scoring "never" when asked if they practice in order to compete, while three MAs were underage for their specific sport to be considered "Masters" (*n = 2* speedskating; *n* = 1 track & field). This also resulted in 1 additional coach being removed for no longer have paired data. Overall, the final sample had 181 MAs and 41 coach participants.

The final sample of MAs ($M_{age}$ = 52.20, *SD* = 11.45) identified as female (67.8%) and male (32.2%). MAs identified as being Caucasian/White (96.7%), Asian (1.7%), Aboriginal (1.1%), and Hispanic (0.6%). The MAs sample indicated having a graduate degree (44.4%), an undergraduate degree (40.0%), a college diploma (11.1%), or a high school diploma (4.4%). At the time of the study, the sample of MAs resided in Canada (87.3%), Australia (12.2%), and the United States (0.6%). On average, the MAs started Masters sport at the age of 38.40 years (*SD* = 14.41). MAs indicated their primary sports as swimming (49.7%), cross-country skiing (9.4%), dragon boating (6.6%), speed skating (6.1%), artistic skating (6.1%), triathlon (5.5%), and 6 other sports (e.g., running, skiing, water polo, rowing, biathlon, artistic skating). MAs participated in their primary sport for an average of 9.97 months per year (*SD* = 2.50), 3.59 times per week (*SD* = 1.94), and 4.41 hours per week (*SD* = 2.80). MAs competed in 2.84 events on

average in the past twelve months (*SD* = 3.69) which ranged from recreational to internationally competitive. On average, MAs were with their current coach for 3.54 years (*SD* = 3.44) and reported their coach was on site for practice/training 2.24 times per week (*SD* = 1.23).

The final sample coaches ($M_{age}$ = 48.63, *SD* = 17.09) identified as female (56.1%) and male (43.9%). The coaches identified as being Caucasian/White (97.6%) or Asian (2.4%). The coach sample indicated having an undergraduate degree (48.8%), a college diploma (22.0%), a graduate degree (19.5%), or a high school diploma (9.8%). At the time of the study, the coaches resided in Canada (92.7%) and Australia (7.3%). On average, coach participants reported being coaches for 14.80 years (*SD* = 10.05) and coaching Masters sport for 8.83 years (*SD* = 6.25). The coaches had various qualifications including level 1, 2, and 3 coaching certifications, NCCP fundamental courses, and courses specific to their sport. The sample coached adult athletes 9.98 months per year (*SD* = 2.17), 3.56 times per week (*SD* = 2.88), and 5.58 hours per week (*SD* = 4.66). On average, the coaches indicated they attended 3.03 Masters sports events in the past twelve months (*SD* = 3.29) ranging from recreational to international competition levels. On average, coaches indicated that their groups of MAs consisted of 2.43 MAs (*SD* = .55) between the age 41 and 54, 2.35 MAs (*SD* = .54) over the age of 55, 2.22 MAs (*SD* = .53) between the age 31 and 40, 1.90 MAs (*SD* = .31) between the age of 20 and 30, and 1.32 MAs (*SD* = .57) under the age of 20. Finally, the coaches indicated that coaching was their primary (22.0%) or secondary means of employment (46.3%), while all others indicated they volunteered their services (31.7%).

## Measures

The same measures that were used in Chapter 1 for coaches (i.e., AOSCS) and MAs (i.e., AOSCS, CART-Q, BNSSS, and PNTS) were used in this study. However, additional measures for MAs were added to this analysis and are presented below.

### *Additional Measures for MAs*

**Additional Single Item Quality Sport Experience Outcomes.** Four additional outcomes were assessed aspects of a QMSE in this study. First, the item "I am committed to keep doing my sport" was intended to measure MAs' functional sport commitment (Young & Medic, 2011). Second, the item "I find participating in sport to be very enjoyable" was intended to measure MAs' sport enjoyment (Bennett, 2014). The final two items, "Because of my coach, I like to go to practice" and "Because of my coach, I want to invest more in my sport" were adapted from Smith, Smoll, and Curtis (1979) to measure the effectiveness of MAs' coaches. The first two items measured MAs' functional commitment and enjoyment on a 7-point Likert Scale from 1 (strongly disagree) to 7 (strongly agree). The final two items measured MAs' perceptions of their coaches' effectiveness on a 7-point Likert Scale from 1 (not at all true for me) to 7 (very true for me).

## Data Analyses

This section will be divided into four parts based on the hypotheses of this study.

### Hypothesis 1: Adult-Oriented Coaching Practices Are Related to MAs' QMSE Outcomes

Four path analyses using the maximum likelihood estimator (MLM) in Mplus Version 8.0 (Muthén & Muthén, 2017) were used to test the relationships between adult-oriented coaching practices and MAs' quality sport experience outcomes using data from the perceptions of MAs and their coaches respectively. Considering the sample in this study was a subset from Chapter 2, the same statiscal assumptions were tested. For the first two path analyses, I used data

from MAs' perceptions of their coaches' use of adult-oriented coaching practices. For the next two path analyses, I used data from the coaches' perspective of how often they employ adult-oriented coaching practices.

***MAs' Perceptions***

For the first path analysis, I was interested in the relationships between MAs' perceptions of their coaches' use of *specific* adult-oriented coaching practices and how they related to MAs' quality sport experience outcomes. To calculate the *specific* adult-oriented coaching practices, I created factor scores by summing the AOSCS items for each respective theme (Rathwell et al., 2020). The five summed factor scores (i.e., CIA, FLS, ICK, RPE, CPP) acted as the independent variables in the first path analysis. To calculate quality sport experience outcomes, I summed the items for each respective theme of the CAR (Jowett & Ntoumanis, 2004; closeness, commitment, and complementarity), MAs' BPN satisfaction (Ng et al., 2011; autonomy IPLOC, autonomy volition, autonomy choice, competence, and relatedness), MAs' BPN thwarting (Bartholomew et al., 2011; autonomy, competence, and relatedness), and the four additional single item outcomes (i.e., MAs' sport commitment and enjoyment, as well as MAs' perceptions of their coaches' effectiveness). The summed scores for our quality sport experience outcomes acted as the dependent variables in the first analysis. See Table 2.1 for the descriptive statistics related to MAs' factor scores.

For the second path analysis, I was interested in the relationships between MAs' perceptions of their coaches' use of adult-oriented coaching practices in *general* and how they related to MAs' quality sport experience outcomes. To calculate the score coaches' use of adult-oriented coaching practices in *general*, I summed all the items from the AOSCS (see Table 2.1). This summed score representing MAs' perceptions of their coaches' *general* use of adult-

oriented coaching practices acted as the independent variable in the second path analysis. Like the first analyses above, the second path analysis used the summed factor scores representing the quality sport experience outcomes as the dependent variables.

***Coaches' Perceptions***

For the third and fourth analyses, I was interested in the relationships between the coaches' perceptions of how often they used *specific,* and *general,* adult-oriented coaching practices and MAs' quality sport experience outcomes. For the independent variables (AOSCS *specific* and general) I calculate our factor scores in the same manner as the first section (i.e., summing items that capture their respective themes of the AOSCS), except coaches' data were used instead of athlete data. Since many of the coaches had multiple athletes who responded about their coaching, I had to calculate our dependent variable differently. To avoid violating the assumption of independence (repeating the same coach's score in the same data set), I averaged the MAs' scores who were from the same coach to create a single team-based average perception of their quality sport experience outcomes. Thus, for each dependent variable (i.e., CAR, MAs' BPN satisfaction, BPN thwarting, and the four additional outcomes), 41 distinct average outcome scores were created to represent each coaches' group of MAs. After averaging the outcome scores, the two independent path analyses were run using coaches' perceptions of their *specific* use of adult-oriented coaching practices and coaches' perception of their *general* use of adult-oriented coaching practices. As noted above, the dependent variables for both coach-based path analyses were the averaged MAs' quality sport experience outcomes scores. See Table 2.1 for the coaches' descriptive statistics.

**Hypothesis 2: Congruence is Related to MAs' QMSE Outcomes**

In this section, I was interested to see if there were relationships between congruence and MAs' quality sport experience outcomes. This section only includes two path analyses (i.e., using MA's data only). In the first path analysis, congruence (respective to each of the five adult-oriented coaching practice themes) acted as the independent variables (i.e., CIA, FLS, ICK, RPE, and CPP). In the second path analysis, congruence of the *general* use of adult-oriented coaching practices acted as the independent variable. In both path analyses, the dependent variables were the summed factor scores of the MAs' quality sport experience outcomes (i.e., CAR, MAs' BPN satisfaction, BPN thwarting, and the four additional outcomes).

**Hypothesis 3: The Relationships Between Adult-Oriented Coaching Practices and MAs' QMSE Outcomes Depend on the Level of AOSCS Congruence**

The purpose of the final analyses was to determine if the relationships between adult-oriented coaching practices and MAs' QMSE outcomes depend on (i.e., mediated by) the level of congruence between MAs' and their coaches' on how often adult-oriented coaching practices are used. I used Mplus Version 8.0 (Muthén & Muthén, 2017) to estimate the direct and indirect effects in the overall model using a bootstrap estimator (Mathieu & Taylor, 2006). When assessing the impact of congruence, it is important to consider the distinctions between mediation and indirect effects. Before a mediation analysis, all the variables used must be tested to determine if associations are present. First, a significant relationship between an independent (i.e., AOSCS) and a dependent variable (i.e., QMSE outcomes), an independent variable (e.g., AOSCS) and a mediator variable (i.e., congruence), and a mediator variable (i.e., congruence) and a dependent variable (i.e., QMSE outcomes) must exist when these variables are tested independently. Additionally, the previously significant relationship between the independent (i.e., AOSCS) and a dependent variable (i.e., QMSE outcomes) must be reduced to a

nonsignificant relationship when the mediator (i.e., congruence) is entered into the model. Partial mediation requires the same circumstances, except that the relationship between the independent (i.e., AOSCS) and a dependent variable (i.e., QMSE outcomes) remains significant, but the level of significance in that relationship is reduced when the mediator (i.e., congruence) is entered into the model. Finally, indirect effects were calculated by assessing changes on the dependent variables (i.e., QMSE outcomes) when the scores on the independent variable (AOSCS) are held fixed, while scores on the mediator variable (congruence) reflect a one-unit increase on the independent variable.

***MAs' Perceptions***

In the first five mediation analyses, I was interested in how congruence impacted the relationship between MAs' perceptions of their coaches' *specific* use of adult-oriented coaching practices and MAs' quality sport experience outcomes. For each of the five mediation analyses, respectively, the five themes (i.e., CIA, FLS, ICK, RPE, and CPP) of adult-oriented coaching practices acted as the independent variable (MAs' perceptions of their coaches' use). The dependent variables in each of the five mediation analyses were MAs' quality sport experience outcomes (i.e., factor scores for MAs' CAR, BPN satisfaction, BPN thwarting, as well as the additional four outcomes). Finally, the mediator for each of the five analyses was the congruence score for each of the respective adult-oriented coaching practice themes (i.e., congruence for CIA, congruence for FLS, congruence for ICK, etc.). See Figure 1 for a visual representation of the tested models.

I was also interested in how congruence might impact the relationship between MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices and MAs' quality sport experience outcomes. To test this relationship, MAs' perceptions of their coaches' *general*

use of adult-oriented coaching practices acted as the independent variable, while the summed factor scores for MAs' quality sport experience outcomes acted as the dependent variables. Finally, the congruence score for *general* adult-oriented coaching practices was the mediator.

***Coaches' Perceptions***

In the remaining six mediation analyses, I used the coaches' data. In the first five coach mediation analyses, I was interested in how congruence might impact the relationship between coaches' perceptions of their use of *specific* adult-oriented coaching practices and MAs' quality sport experience outcomes. For each of the five mediation analyses, respectively, the five themes (i.e., CIA, FLS, ICK, RPE, and CPP) of adult-oriented coaching practices acted as the independent variable (coaches' perceptions of their use). The dependent variables in each of the five mediation analyses were MAs' average scores for quality sport experience outcomes (i.e., factor scores for MAs' CAR, BPN satisfaction, BPN thwarting, as well as the additional four outcomes). Finally, the mediator for each of the five analyses was the congruence score for each of the respective adult-oriented coaching practice themes (i.e., congruence for CIA, congruence for FLS, congruence for ICK, etc.).

In the last mediation analysis, I was interested in how congruence might impact the relationship between coaches' *general* use of adult-oriented coaching practices and MAs' quality sport experience outcomes. Coaches' perceptions of their *general* use of adult-oriented coaching practices acted as the independent variable, while the average factor scores for MAs' quality sport experience outcomes acted as the dependent variables. Finally, the congruence score for *general* adult-oriented coaching practices acted as the mediator.

## Results

Descriptive statistics for both coaches and MAs are displayed in Table 2.1.

**Hypothesis 1: Adult-Oriented Coaching Practices Are Related to MAs' QMSE Outcomes**

My first hypothesis was partially supported since positive relationships existed between MAs' perceptions of their coaches' use of adult-oriented coaching practices and quality sport experience outcomes (i.e., CAR, MAs' BPN satisfaction, practice-liking, investment, sport commitment, sport enjoyment). However, there were also positive relationships with MAs' BPN thwarting which I did not hypothesize. These results will be presented in two separate sections. First, the results for the path analyses using MA's data will be presented. Second, the results for the path analyses using the coaches' data are shown. These sections will be further divided based on the dependent variables (i.e., CAR, BPN satisfaction, BPN thwarting, and additional outcomes). See Table 2.4 for the bivariate correlation analysis using MAs' variables and Table 2.5 for the coaches' variables.

***MAs' Perceptions of Adult-Oriented Coaching Practices***

**Coach-Athlete Relationship.** MAs' perceptions of their coaches' use of ICK were positively related to MAs' closeness ($\beta = .331$, $p < .001$), commitment ($\beta = .266$, $p = .002$), and complementarity ($\beta = .189$, $p = .033$). MAs' perceptions of their coaches' use of RPE were positively related to MAs' complementarity ($\beta = .343$, $p < .001$), commitment ($\beta = .295$, $p = .001$), and closeness ($\beta = .228$, $p = .020$). The remaining adult-oriented coaching variables (i.e., CIA, FLS, & CPP) had no relationships with the CAR variables. MAs' perceptions of their coaches' use of *general* adult-oriented coaching practices were positively associated with MAs' commitment ($\beta = .640$, $p < .001$), closeness ($\beta = .554$, $p < .001$), and complementarity ($\beta = .508$, $p < .001$).

**Basic Needs Satisfaction.** MAs' perceptions of their coaches' use of CIA were positively associated with MAs' relatedness ($\beta = .485$, $p < .001$), autonomy choice ($\beta = .414$, $p = .001$), and

autonomy volition satisfaction ($\beta$ = .310, $p$ = .004). MAs' perceptions of their coaches' use of RPE were positively related to MAs' autonomy IPLOC satisfaction ($\beta$ = .286, $p$ = .009), while MAs' perceptions of their coaches' use of CPP were positively related to MAs' competence satisfaction ($\beta$ = .264, $p$ = .031). MAs' perceptions of their coaches' use of FLS and ICK were not related to any of the MAs' BPN satisfaction variables. Coaches' *general* use of adult-oriented coaching practices were positively associated with MAs' relatedness ($\beta$ = .432, $p$ < .001), autonomy choice ($\beta$ = .390, $p$ < .001), autonomy IPLOC ($\beta$ = .374, $p$ < .001), and competence satisfaction ($\beta$ = .336, $p$ < .001). MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices were not related to MAs' autonomy volition satisfaction.

**Basic Needs Thwarting.** MAs' perceptions of their coaches' use of CPP were positively associated with MAs' autonomy ($\beta$ = .279, $p$ = .010) and competence thwarting ($\beta$ = .254, $p$ = .012). MAs' perceptions of their coaches' use of CIA were negatively related to MAs' autonomy thwarting ($\beta$ = -.270, $p$ = .020). MAs' perceptions of their coaches' use of FLS, ICK, and RPE were not related to any of the MAs' BPN thwarting variables. MAs' perceptions of their coaches' use of *general* adult-oriented coaching practices were negatively related to MAs' autonomy thwarting ($\beta$ = -.199, $p$ = .004). MAs' perceptions of their coaches' *general* use of adult-oriented coaching practices were not related to MAs' competence and relatedness thwarting.

**Additional Quality Sport Experience Outcomes.** MAs' perceptions of their coaches' use of RPE were positively related to MAs liking practice because of their coach ($\beta$ = .316, $p$ = .005). MAs' perceptions of their coaches' use of FLS were positively related to MAs' sport commitment ($\beta$ = .270, $p$ = .012). Finally, MAs' perceptions of their coaches' use of CIA were positively related to MAs wanting to invest more in their sport because of their coach ($\beta$ = .242, $p$ = .004). MAs' perceptions of their coaches' use of *general* adult-oriented coaching practices

were positively associated with MAs wanting to invest more in their sport because of their coach ($\beta$ = .586, $p$ < .001), MAs liking practice because of their coach ($\beta$ = .421, $p$ < .001), sport enjoyment ($\beta$ = .316, $p$ < .001), and sport commitment ($\beta$ = .243, $p$ = .001).

***Coaches' Perceptions of Adult-Oriented Coaching Practices***

**Coach-Athlete Relationship.** Coaches' perceptions on how often they employed CIA, FLS, ICK, RPE, and CPP were not related to MAs' closeness, commitment, or complementarity. Additionally, coaches' perceptions of their *general* use of adult-oriented coaching practices, were not related to MAs' closeness, commitment, or complementarity.

**Basic Needs Satisfaction.** Coaches' perceptions of how often they employed RPE were positively associated with MAs' competence ($\beta$ = .389, $p$ = .001), relatedness ($\beta$ = .327, $p$ = .041), and autonomy choice satisfaction ($\beta$ = .326, $p$ = .011). The coaches' perceptions of how often they employed FLS were positively related to MAs' autonomy choice ($\beta$ = .379, $p$ = .008), competence ($\beta$ = .357, $p$ = .007), and relatedness satisfaction ($\beta$ = .255, $p$ = .031). The coaches' perceptions of how often they employed CPP were positively related to MAs' autonomy choice ($\beta$ = .366, $p$ = .003) and competence satisfaction ($\beta$ = .334, $p$ = .017). The coaches' perceptions of how often they employed ICK were positively related to MAs' competence satisfaction ($\beta$ = .341, $p$ = .009). Finally, the coaches' perceptions of how often they employed CIA were positively related to MAs' competence ($\beta$ = .271, $p$ = .031) and autonomy choice satisfaction ($\beta$ = .266, $p$ = .025). Coaches' perceptions on their own *general* use of adult-oriented coaching practices were positively related to MAs' competence ($\beta$ = .408, $p$ = .001) and autonomy choice satisfaction ($\beta$ = .403, $p$ = .001). The coaches' perceptions on their *general* use of adult-oriented coaching practices were not related to the MAs' autonomy IPLOC, autonomy volition, relatedness satisfaction.

**Basic Needs Thwarting.** In terms of *specific* and *general* adult-oriented coaching practices, the coaches' perceptions on how often they employed adult-oriented coaching were not related to MAs' autonomy, competence, and relatedness thwarting.

**Additional Quality Sport Experience Outcomes.** Coaches' perceptions on how often they employed CPP were positively related to MAs wanting to invest more into their sport because of their coach ($\beta$ = .290, $p$ = .013). The coaches' perceptions on how often they employed CIA, FLS, ICK, and RPE were not related to any of the other quality sport experience outcomes. Additionally, the coaches' perceptions of their *general* use of adult-oriented coaching practices were positively related to MAs wanting to invest more into their sport because of their coach ($\beta$ = .260, $p$ = .019). The coaches' perceptions on their *general* use of adult-oriented coaching practices were not related to MAs' sport commitment, nor MAs' perceptions of their coaches' effectiveness.

**Hypothesis 2: Congruence is Related to MAs' QMSE Outcomes**

Our second hypothesis was partially supported since congruence was significantly related to some of the MAs' quality sport experience outcomes. This section of the results will be divided into two subsections based on athlete and coach data respectively.

***Coach-Athlete Relationship***

In terms of *specific* adult-oriented coaching practices, the levels of congruence between MAs and their coaches on CIA, RPE, and CPP were negatively related with MAs' closeness ($\beta$ = -.282, $p$ = .003; $\beta$ = -.279, $p$ < .001; $\beta$ = -.289, $p$ = .001, respectively), commitment ($\beta$ = -.310, $p$ < .001; $\beta$ = -.241, $p$ = .002; $\beta$ = -.321, $p$ < .001, respectively), and complementarity ($\beta$ = -.238, $p$ = .011; $\beta$ = -.174, $p$ = .038; $\beta$ = -.194, $p$ = .039, respectively). The level of congruence between MAs and their coaches on ICK was negatively related to MAs' closeness ($\beta$ = -.259, $p$ = .004).

The level of congruence between MAs and their coaches on FLS was not related to MAs' closeness, commitment, or complementarity.

In terms of *general* adult-oriented coaching practices, the level of congruence between MAs and their coaches on *general* adult-oriented coaching practices was negatively related to MAs' closeness ($\beta$ = -.320, $p$ < .001), commitment ($\beta$ = -.249, $p$ = .005), and complementarity ($\beta$ = -.218, $p$ = .016).

***Basic Needs Satisfaction***

In terms of *specific* adult-oriented coaching practices, the levels of congruence between MAs and their coaches on CIA, CPP, and RPE were negatively related to MAs' relatedness satisfaction ($\beta$ = -.318, $p$ < .001; $\beta$ = -.247, $p$ = .001; $\beta$ = -.140, $p$ = .029, respectively), while congruence for FLS was positively related to MAs' relatedness satisfaction ($\beta$ = .133, $p$ = .036). The levels of congruence between MAs and their coaches on CIA, CPP, and RPE were negatively related to MAs' autonomy choice satisfaction ($\beta$ = -.282, $p$ < .001; $\beta$ = -.189, $p$ = .013; $\beta$ = -.185, $p$ = .006, respectively). The levels of congruence between MAs and their coaches on CPP was negatively related to MAs' autonomy IPLOC ($\beta$ = -.171, $p$ = .033) and competence satisfaction ($\beta$ = -.146, $p$ = .040). Finally, the level of congruence between MAs and their coaches on ICK was not related to MAs' BPN satisfaction outcomes.

In terms of *general* adult-oriented coaching practices, the level of congruence between MAs and their coaches on *general* adult-oriented coaching practices was negatively related to MAs' autonomy IPLOC satisfaction ($\beta$ = -.149 $p$ = .049). The level of congruence between MAs and their coaches on *general* adult-oriented coaching practices was not related to MAs' competence, relatedness, autonomy choice, or autonomy volition satisfaction.

***Basic Needs Thwarting***

In terms of *specific* adult-oriented coaching practices, the level of congruence between MAs and their coaches on CIA was positively related to MAs' autonomy thwarting ($\beta$ = .172, $p$ = .021). The levels of congruence between MAs and their coaches on FLS, ICK, RPE, and CPP, were not related to MAs' BPN thwarting.

In terms of *general* adult-oriented coaching practices, the level of congruence between MAs and their coaches on *general* adult-oriented coaching practices was not related to MAs' autonomy, competence, and relatedness thwarting.

***Additional Quality Sport Experience Outcomes***

In terms of *specific* adult-oriented coaching practices, the levels of congruence between MAs and their coaches on CIA, RPE, and CPP were negatively related to MAs liking practice because of their coach ($\beta$ = -.314, $p$ < .001; $\beta$ = -.212, $p$ = .013; $\beta$ = -.221, $p$ = .020, respectively), and MAs wanting to invest more into sport because of their coach ($\beta$ = -.272, $p$ = .002; $\beta$ = -.171, $p$ = .023; $\beta$ = -.218, $p$ = .008, respectively). The levels of congruence between MAs and their coaches on FLS and ICK were not related to MAs' liking practice or wanting to invest more into their sport, because of their coach. Additionally, the level of congruence between MAs and their coaches on FLS was positively related to MAs' sport enjoyment ($\beta$ = .137, $p$ = .023). However, the level of congruence between MAs and their coaches on CIA, ICK, RPE, and CPP were not related to MAs' sport commitment or enjoyment.

In terms of *general* adult-oriented coaching practices, the level of congruence between MAs and their coaches on *general* adult-oriented coaching practices was positively related to MAs liking practice because of their coach ($\beta$ = -.225, $p$ = .015), as well as MAs wanting to invest more into their sport because of their coach ($\beta$ = -.222, $p$ = 002).

**Hypothesis 3: The Relationships Between Adult-Oriented Coaching Practices and MAs' QMSE Outcomes Depend on the Level of AOSCS Congruence**

As noted above, when testing for mediation there are certain analytic procedures that must be followed. More specifically, a significant relationship between an independent (i.e., AOSCS) and a dependent variable (i.e., QMSE outcomes), an independent variable (e.g., AOSCS) and a mediator variable (i.e., congruence), and a mediator variable (i.e., congruence) and a dependent variable (i.e., QMSE outcomes) must exist when these variables are tested independently. The links between independent and dependent, and mediator and dependent variables were observed when testing hypothesis one and two respectively. Thus, before testing hypothesis three, I still needed to test the associations between the independent and mediator variables.

***Mediation Check***

See Table 2.2 and 2.3 for the descriptive statistics on congruence for MAs and coaches' data respectively. MAs' perceptions of Adult-Oriented Coaching Practices MAs' perceptions of their coaches' use of FLS was positively related to FLS congruence ($\beta$ = .193, p = .028). Further, MAs' perceptions of their coaches' use of CIA ($\beta$ = -.524, $p$ < .001), CPE ($\beta$ = -.306, $p$ < .001), RPE ($\beta$ = -.233, $p$ = .003), and ICK ($\beta$ = -.163, $p$ = .045) were negatively related to congruence. MAs' perceptions of their coaches' general use of adult-oriented coaching practices were not significantly related to congruence of general adult-oriented coaching practices. Coaches' perceptions on how often they employed CIA ($\beta$ = -.451, $p$ < .001), FLS ($\beta$ = -.423, $p$ = .030), RPE ($\beta$ = -.398, $p$ = .001), and CPP ($\beta$ = -.383, $p$ = .011) were negatively related to CIA, FLS, RPE, and CPP congruence, respectively. The coaches' perceptions of how often they employed ICK were not related to ICK congruence. Further, coaches' perceptions of their general use of

adult-oriented coaching practices were not significantly related to the congruence of general adult-oriented coaching practices.

**Mediation Analysis.** Our third and final hypothesis was not supported. Specifically, congruence did not act as a mediator between MAs' perceptions of their coaches' *general* and *specific* use of adult-oriented coaching practices and MAs' quality sport experience outcomes (see Table 2.6 for total, specific indirect, and direct effects). Additionally, congruence did not act as a mediator between the coaches' perceptions on how often they employ *general* and *specific* adult-oriented coaching practices and MAs' quality sport experience outcomes (see Table 2.7 for total, specific indirect, and direct effects).

## Discussion

In sport coaching literature, congruence, as it pertains to effective coaching practices, has been studied as early as the 1970s (e.g., Chelladurai et al., 1978; Smoll et al., 1978). Together, two prominent frameworks, Smoll and colleagues' (1978) Mediational Model of Leadership and the Multidimensional Model of Leadership (MML; Chelladurai, 2007), tell us that (a) congruence is important for promoting athlete outcomes, and (b) that the impact of coaches' behaviours on athletes' outcomes is dependent on congruence. For this reason, in this second study, I hypothesized that congruence would be related to MAs' QMSE outcomes, and that congruence would mediate the relationships between coaches' use of adult-oriented coaching practices and MAs' QMSE outcomes.

### *Relationships Between Congruence and Hallmarks of a QMSE*

Overall, the findings generally support Chelladurai's (1978) congruency hypothesis and the MML (Chelladurai, 2007) by showing that athletes' outcomes (i.e., hallmarks of a QMSE) were a direct function of the congruence of coaching behaviours (i.e., adult-oriented coaching

practices). More specifically, the findings showed that when MAs' and coaches' perceptions were more aligned about coaches' general use of adult-oriented practices, there were positive associations with six outcomes (i.e., closeness, commitment, complementarity, autonomy IPLOC, practice-liking, and sport investment) measuring two of the five hallmarks of a QMSE (i.e., *quality relationships* and *feeling empowered*).

The findings also suggest that congruence surrounding specific adult-oriented coaching practices may be more important than congruence related to the general use of adult-oriented coaching practices. For example, congruence related to considering the individuality of athletes was positively related to eight (i.e., closeness, commitment, complementarity, relatedness, practice-liking, sport investment, autonomy choice, and a reduction in autonomy thwarting) outcomes representing two of the hallmarks of a QMSE. Likewise, creating personalized programming was related to nine outcomes (i.e., closeness, commitment, complementarity, relatedness, practice-liking, sport investment, competence, autonomy choice, and autonomy IPLOC) representing three of the hallmarks of a QMSE. Further, congruence on respecting preferences for effort, accountability, and feedback had positive relationships with six outcomes (i.e., closeness, commitment, complementarity, practice-liking, sport investment, and autonomy choice) representing two hallmarks of a QMSE. Together these results suggest that congruence on three of the five adult-oriented coaching practices is just as important, or more important for fostering hallmarks of a QMSE than assessing congruence related to the general use of adult-oriented coaching practices.

With regards to the three specific adult-oriented coaching practices where congruence was particularly important for hallmarks of a QMSE, a common theme was that coaches needed to account for the uniqueness or individuality of their adult athletes. These findings align with

previous literature where MAs have expressed the amount of effort, caring, and loyalty that their coaches put into their craft when trying to individualize each athletes' learning (Callary et al., 2017; Ferrari et al., 2016). MacLellan and colleagues (2017) revealed a similar position from coaches: "as a Masters coach, you have to manage the wants and desires of the adults along with running a coaching program" (p. 6). The coach added that balancing coaching and managing their adult athletes' desires is "dancing a very fine line" (p. 6). Taken together, we see that when coaches try to ensure their coaching practices are more congruent with the MAs' unique characteristics, MAs not only recognize this, but they benefit in terms of their sport experiences.

***Congruence as a Mediator***

Based on Smoll and colleagues' (1978) Mediational Model of Leadership, I expected that when coaches' and MAs' perceptions were more congruent, this would facilitate positive relationships between the coaches' use of adult-oriented coaching practices and the hallmarks of a QMSE. Contrary to my hypothesis and Smoll et al.'s (1978) Mediational Model of Leadership, the findings from study two showed that congruence related to general and specific adult-oriented coaching practices did *not* mediate the relationships between the coaches' use of adult-oriented coaching practices and hallmarks of a QMSE.

One methodological explanation for the null findings might be how I calculated the congruence scores (i.e., difference scores). Chelladurai (2007) posited that discrepancy scores may not be reliable when examining congruence based on certain problems associated with the statistic. Specifically, difference scores have many problems with their underlying components when analyzing data (Cronbach & Furby, 1970; Johns 1981). For instance, Johns (1981) explained that "the reliability of a difference score tends to be less than the average reliability of its component parts" (p. 447). Additionally, Johns adds that artificial relationships may occur

between change scores and outcome variables. In this case, when difference/change scores are correlated with their components, they are more likely to be correlated with other variables (i.e., outcome variables) that are associated with the component parts. As such, Johns (1981) recommends that researchers frame questions in other ways to avoid the use of difference/change scores in their analyses.

Although Johns (1981) raises some important considerations, his comments were made about intervention research (i.e., treatment variables) and were not about measuring congruence. Moreover, Johns' recommendations were made before major advancements in now widely used data analysis software (e.g., SPSS, Mplus, LISREL). These technological advancements have led other researchers (e.g., see Gollwitzer et al., 2014) to conclude that difference scores are perfectly reliable and should be used in social psychology research in the right context. For example, Gollwitzer et al. (2014) concluded that difference score models are appropriate when there is no treatment between data collection points. However, just like Johns (1981), Gollwitzer and colleagues did not consider the utility of difference scores when assessing congruence. Taken together, prior literature remains mixed regarding difference scores. Future researchers should meticulously determine the appropriateness of difference scores when planning their projects, calculating the congruence of coaching behaviours, and analyzing their data.

Alternative ways of assessing congruence have been previously discussed by sport psychology researchers. For instance, Chelladurai (2007) recommends hierarchical regression analyses to test congruence (Chelladurai, 1993; Chelladurai & Riemer, 1998). Chelladurai suggests that the athletes' preferred and perceived behaviours are entered into the model first to determine their effects on outcomes. Next, an interaction variable of preferred and perceived behaviours would be entered into the model. If the interaction variable has a significant

contribution of variance in the model (with respect to the outcomes), then congruence is explaining the outcomes. This method was tested and supported by Riemer and Chelladurai (1995), yet later rejected by the results from Riemer and Toon (2001). Congruence has been rarely examined (e.g., Andrew, 2009) in this fashion outside of these mixed results. Future researchers should attempt to pinpoint the best analysis to analyze the congruence of coaching behaviours.

Another methodological explanation for our null results might be how I measured congruence. In previous studies examining the mediational role of congruence, Smoll et al., (1978) directly observed and coded the coaches' actual behaviours using the Coaching Behaviour Assessment System (CBAS) and measuring the athletes' perceptions of their coaches' behaviours using a self-report tool. In this study, I measured coaches' perceptions of their coaching behaviours using a self-report tool (i.e., AOSCS). For this reason, the data were likely more prone to recall errors. The findings might also be explained by subtle differences in how I conceptualized congruence. When looking at Smoll and colleagues' Mediational Model of Leadership, it only stipulates that athletes' perceptions of coaching behaviours would mediate the relationships between coaching practices and athlete outcomes (i.e., offering only a proxy measure of congruency). In the current study, the methods aligned more with Chelladurai's (2007) conceptualization of congruence, whereby I created a congruency score using differences between coaches' and athletes' perceptions of coaching behaviours (i.e., perceptual congruence).

It is also possible that the AOSCS measurement scale was responsible for the null findings related to congruence as a mediator. Specifically, the AOSCS asks coaches and MAs "how often" the coach uses specific practices. Previous authors have suggested that it may be valuable to measure the importance or preference that athletes place on certain coaching

behaviours or the expectations that athletes' have of their coach (Chelladurai, 2007). The choice of scale also influenced the type of congruence that I assessed (i.e., perceptual congruence), which may have contributed to the null findings. However, other studies have examined coaching behaviours congruence in the same way that I did in study two and found similar results (Laughlin & Laughlin, 1970; Light Shields et al. 1997).

Laughlin and Laughlin (1970) used self-report surveys (i.e., the Instructor Opinion Questionnaire and the Leadership Scale for Sport) for both coaches and athletes. Their findings were like mine, where congruence was related to positive outcomes for athletes. Of note, Laughlin and Laughlin did not test whether congruence mediated the relationship between coach behaviours and athlete outcomes. Another study conducted by Light Shields et al. (1997) also used self-report surveys for both the coaches' and athletes' perception, but once again did not perform a mediation analysis. It is difficult to assess the utility of a perceptual congruence score as a mediator within the sports literature due to the limited number of studies.

Outside of the realm of sport psychology, perceptual congruence has been examined in the business domain. In general, researchers have found that when perceptions were less similar (i.e., less congruent) between interacting agents, it has resulted in negative outcomes (e.g., marital distress, communications disruptions, and relationships termination; Beach & Arias, 1983; Hill et al., 1981; White & Reavis, 1981). With this said, studies conducted in the business context suffer from the same limitation, where perceptual congruence is only considered as an independent variable rather than a mediating variable (e.g., see Kuo & Rice, 2015; Ozbek & Yuldashev, 2010). Taken together, it seems that perceptual congruence is a good measure for researchers who are interested in predicting positive athlete outcomes. However, it does not

appear that perceptual congruence mediates the relationships between coaches' behaviours and athletes' QMSE outcomes.

A few studies exist that have looked at value congruence (i.e., the level of similarity between an athlete's perceptions of leadership behaviours and their preferences for leadership behaviours), although their results have been mixed. Horne and Carron (1985) found that value congruence predicted increased athlete performance, while Chelladurai (1984) found that it increased athlete satisfaction. These findings were later contradicted by Riemer and Toon (2001) who found that athlete satisfaction was not impacted by value congruence. Importantly, neither of these studies tested value congruence as a mediator variable.

Considering the mixed findings in previous literature, and the findings from study two, it may be beneficial for future researchers to measure both perceptual and value congruence. To the best of my knowledge, only one study (Light Shields et al., 1997) has compared the two types of congruence in sport. Specifically, Light Shields and colleagues (1997) examined the differences between athletes' perceptions and preferences for coaching behaviours. The authors concluded that researchers should measure perceptions (i.e., what "is") rather than preferences (e.g., what "ought to be"; p. 208) due to a higher number of relationships between perceptual congruence and positive outcomes for athletes. Considering that this is the only coaching study to have examined both types of congruence, future researchers should pursue more evidence for determining the best measure of congruence in terms of coaching behaviours. With this said, the evidence provided by Light Shields and colleagues' (1997) supports our decision to assess perceptual congruence instead of value congruence when testing adult-oriented coaching.

A final methodological limitation of the second study might also allow me to interpret the null findings regarding the mediational models. Specifically, congruence in study two was

examined cross-sectionally. Since perceptual congruence has not been regularly measured in terms of coaching behaviours in sport, no studies to my knowledge have examined changes in perceptual congruence over time and how that affects the quality of sporting experiences for athletes. Beyond sports literature, two studies from Cable and Judge (Cable & Judge, 1997; Judge & Cable, 1997) found that congruence had more influence on organizational and individual outcomes over time when looking at job seekers and prospective workplaces. These findings add further complexity to the assessment of congruence, suggesting that assessing congruence over time might allow for a more accurate test of its mediational role.

In addition to methodological considerations, there is a conceptual reason for why congruence did not mediate the relationships between adult-oriented coaching and QMSE outcomes that is unique to the Master's context. Specifically, groups of MAs are heterogeneous and vary greatly in: (a) life experiences inside and outside of sport (Young et al., 2014), (b) age, gender, skill levels (Heazlewood et al., 2013; Medic, 2009; Medic et al., 2009), (c) life stages (Dionigi et al., 2012), and (d) coaching preferences, wants, and needs (Callary et al., 2015). Currently, the Mediational Model of Leadership (Smoll & Smith, 1989) does recognize that athletes have unique characteristics (e.g., age, sex, perceived coaching norms, motives, anxieties, self-esteem) that affect their perceptions and preferences of leadership behaviours, as well as reactions (i.e., outcomes) related to the leadership behaviours. Similarly, the MML (Chelladurai, 2007) posits that there are situational characteristics (e.g., sport type, practice vs. competition, one-on-one vs. group-based coaching) and coach characteristics (e.g., age, sex, leadership intentions, perceived coaching norms) that must be considered when looking at congruence. However, considering that coaches of MAs must account for many of these variables at once when personalizing their coaching approaches with their MAs within the same team (Callary et

al., 2017; MacLellan et al., 2017, 2019), it is understandable that measuring congruence is difficult in the Masters' domain. Given the heterogeneous nature of groups of MAs, future researchers may wish to have coaches respond to how they use adult-oriented practices with each one of their athletes instead of considering their general use (like in this study); albeit having a coach respond to the survey for each one of their athletes would certainly create problems with participant retention.

## Conclusion

The findings of this study highlight the importance of congruence in terms of coaching MAs while simultaneously suggesting the relationships between adult-oriented coaching practices and QMSE outcomes do not depend on congruent coaching practices. Further, the limitations identified in this study (i.e., calculating, measuring, and analyzing congruence of coaching practices) coupled with the lack of empirical attention dedicated to congruence in the past decades, should impress upon researchers in the coaching domain. Specifically, since congruent coaching practices are associated with positive athlete outcomes, coaching researchers should seek to address the most effective and efficient ways to incorporate congruence into their research in the future.

## Tables and Figures

**Table 2.1** Descriptive statistics for Masters Athletes' (MAs; $n = 181$) and their coaches' ($n = 41$) perceptions of *specific* and *general* adult-oriented coaching practices, as well as MAs' quality sport experience outcomes.

| | | Mean | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|
| | | Statistic | S.E. | S.D. | Statistic | S.E. | Statistic | S.E. |
| | Variable | Masters Athletes | | | | | | |
| *AOSCS* | CIA | 20.41 | 0.43 | 5.82 | -0.70 | 0.18 | -0.26 | 0.36 |
| | FLS | 33.56 | 0.57 | 7.67 | -0.09 | 0.18 | -0.45 | 0.36 |
| | ICK | 16.22 | 0.30 | 3.99 | -0.89 | 0.18 | 0.51 | 0.36 |
| | RPE | 16.39 | 0.29 | 3.85 | -0.79 | 0.18 | -0.05 | 0.36 |
| | CPP | 23.79 | 0.59 | 7.90 | -0.47 | 0.18 | -0.67 | 0.36 |
| | AOSCS General | 110.38 | 1.86 | 25.03 | -0.47 | 0.18 | -0.31 | 0.36 |
| *CART-Q* | Commitment | 17.52 | 0.26 | 3.47 | -1.37 | 0.18 | 2.02 | 0.36 |
| | Closeness | 26.10 | 0.23 | 3.16 | -2.07 | 0.18 | 3.94 | 0.36 |
| | Complementarity | 25.70 | 0.25 | 3.42 | -2.05 | 0.18 | 4.71 | 0.36 |
| *BNSSS* | Competence | 28.11 | 0.37 | 4.93 | -0.65 | 0.18 | 0.46 | 0.36 |
| | Choice | 22.16 | 0.37 | 4.98 | -1.09 | 0.18 | 1.31 | 0.36 |
| | IPLOC | 19.40 | 0.15 | 2.02 | -1.46 | 0.18 | 1.69 | 0.36 |
| | Volition | 19.83 | 0.14 | 1.91 | -1.91 | 0.18 | 2.93 | 0.36 |
| | Relatedness | 30.83 | 0.35 | 4.64 | -1.37 | 0.18 | 1.71 | 0.36 |
| *PNTS* | Autonomy | 6.89 | 0.29 | 3.90 | 1.37 | 0.18 | 1.09 | 0.36 |
| | Competence | 5.92 | 0.25 | 3.42 | 2.61 | 0.18 | 8.22 | 0.36 |
| | Relatedness | 5.43 | 0.23 | 3.06 | 3.74 | 0.18 | 19.27 | 0.36 |
| *Additional* | BC1 | 6.41 | 0.07 | 0.99 | -1.82 | 0.18 | 2.64 | 0.36 |
| | BC2 | 6.09 | 0.01 | 1.34 | -1.71 | 0.18 | 2.64 | 0.36 |
| | SC | 6.54 | 0.06 | 0.82 | -2.23 | 0.18 | 5.53 | 0.36 |
| | SE | 6.69 | 0.05 | 0.62 | -2.14 | 0.18 | 4.43 | 0.36 |
| | | Coaches | | | | | | |
| *AOSCS* | CIA | 21.83 | 0.77 | 4.95 | -1.26 | 0.37 | 1.56 | 0.72 |
| | FLS | 31.54 | 1.26 | 8.06 | -0.07 | 0.37 | -0.16 | 0.72 |
| | ICK | 16.17 | 0.52 | 3.35 | -0.99 | 0.37 | 1.72 | 0.72 |
| | RPE | 16.40 | 0.51 | 3.26 | -0.89 | 0.37 | 1.22 | 0.72 |
| | CPP | 24.97 | 1.26 | 8.07 | -0.76 | 0.37 | -0.09 | 0.72 |
| | AOSCS General | 110.91 | 3.57 | 22.83 | -0.79 | 0.37 | 0.51 | 0.72 |

***Note:*** AOSCS = Adult-Oriented Sport Coaching Survey; CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General =

Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; AOSCS = *general* adult-oriented coaching practices. Potential scale ranges (summed item responses using a 7-point Likert Scale responses): CIA = 4-28; FLS = 7-49; ICK = 3-21; RPE = 3-21; CPP = 5-35; AOSCS General = 22-154; Commitment = 3-21; Closeness = 4-28; Complementarity = 4-28; Relatedness = 5-35; Autonomy IPLOC = 3-21; Autonomy Volition = 3-21; Autonomy Choice = 4-28; Competence = 5-35; Autonomy Thwarting = 4-28; Competence Thwarting = 4-28; Relatedness Thwarting = 4-28.

**Table 2.2** Descriptive statistics for congruence using the Masters athlete's data ($n$ = 181). Of importance, the athletes' corresponding coach data (i.e., coaches who coached the same athletes) were duplicated to calculate a unique congruence score for each athlete.

| | Mean Congruence | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|
| | Statistic | S.E. | S.D. | Statistic | S.E. | Statistic | S.E. |
| CIA | 5.35 | 0.33 | 4.39 | 1.08 | 0.18 | 0.74 | 0.36 |
| FLS | 7.74 | 0.43 | 5.74 | 1.00 | 0.18 | 1.04 | 0.36 |
| ICK | 3.78 | 0.21 | 2.85 | 0.96 | 0.18 | 0.72 | 0.36 |
| RPE | 3.51 | 0.20 | 2.68 | 0.78 | 0.18 | 0.01 | 0.36 |
| CPP | 7.07 | 0.42 | 5.68 | 0.91 | 0.18 | 0.25 | 0.36 |
| AOSCS General | 21.37 | 1.22 | 16.37 | 0.97 | 0.18 | 0.77 | 0.36 |

***Note:*** CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General = General adult-oriented coaching practice congruence scores. Potential congruence ranges for each scale (calculated by subtracting coaches' scores on summed item responses using 7-point Likert Scale responses from MAs' scores on summed item responses using a 7-point Likert Scale): CIA = 0-24; FLS = 0-42; ICK = 0-19; RPE = 0-18; CPP = 0-30; AOSCS General = 0-132.

**Table 2.3** Descriptive statistics for congruence calculated using the coaches' data ($n$ = 41). Of importance, the corresponding athletes' data (i.e., athletes coached by the same coach) were averaged to calculate congruence based on the size of the coach sample.

| | Mean Congruence | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|
| | Statistic | S.E. | S.D. | Statistic | S.E. | Statistic | S.E. |
| CIA | 4.07 | 0.42 | 2.71 | 0.53 | 0.37 | -0.21 | 0.72 |
| FLS | 6.23 | 0.69 | 4.41 | 0.87 | 0.37 | -0.09 | 0.72 |
| ICK | 2.85 | 0.36 | 2.30 | 0.75 | 0.37 | 0.57 | 0.72 |
| RPE | 2.57 | 0.34 | 2.20 | 1.25 | 0.37 | 1.64 | 0.72 |
| CPP | 5.42 | 0.71 | 4.52 | 0.73 | 0.37 | -0.45 | 0.72 |
| AOSCS General | 15.97 | 2.00 | 12.84 | 0.87 | 0.37 | 0.25 | 0.72 |

***Note:*** CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS General = General adult-oriented coaching practice congruence scores. Potential congruence ranges for each scale (calculated by subtracting MAs' scores on summed item responses using 7-point Likert Scale responses from coaches' scores on summed item responses using a 7-point Likert Scale): CIA = 0-24; FLS = 0-42; ICK = 0-19; RPE = 0-18; CPP = 0-30; AOSCS General = 0-132. Lower scores on congruence are associated with more congruent perceptions.

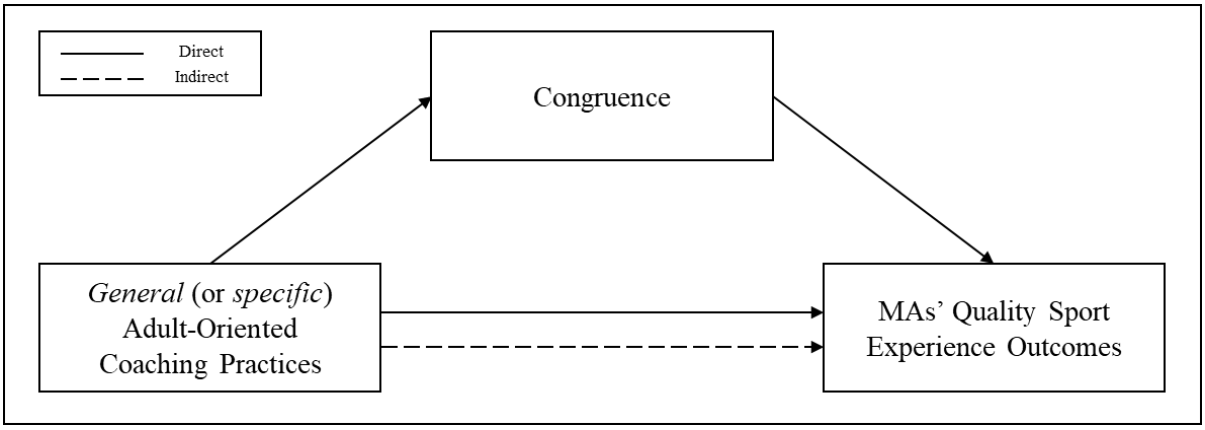


**Figure 2.1** Tested model (hypothesized) with congruence as the mediator between adult-oriented coaching practices and Masters Athletes' (MAs) quality sport experience outcomes. The congruence variable represents the similarity between coaches' and MAs' perceptions of how frequent adult-oriented coaching practices.

**Table 2.4** Correlation analysis of Masters Athletes' (MAs; *n* = 181) AOSCS variables, MAs' quality sport experience outcome variables, and congruence.

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AOSCS | CIA | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FLS | 2 | .625** | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ICK | 3 | .571** | .652** | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| | RPE | 4 | .655** | .648** | .577** | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | CPP | 5 | .732** | .700** | .603** | .711** | 1 | | | | | | | | | | | | | | | | | | | | | | |
| | AOSCS | 6 | .847** | .876** | .771** | .821** | .906** | 1 | | | | | | | | | | | | | | | | | | | | | |
| Congruence | CIA Congruence | 7 | -.528** | -.294** | -.231** | -.262** | -.333** | -.395** | 1 | | | | | | | | | | | | | | | | | | | | |
| | FLS Congruence | 8 | 0.097 | .176* | 0.011 | .149* | 0.125 | 0.141 | 0.118 | 1 | | | | | | | | | | | | | | | | | | | |
| | ICK Congruence | 9 | -.171* | -.176* | -.196** | -0.086 | -.178* | -.194** | .234** | .296** | 1 | | | | | | | | | | | | | | | | | | |
| | RPE Congruence | 10 | -.188* | -0.117 | -.153* | -.193** | -.210** | -.200** | .312** | 0.110 | .352** | 1 | | | | | | | | | | | | | | | | | |
| | CPP Congruence | 11 | -.210** | -.224** | -.234** | -0.136 | -.310** | -.274** | .402** | 0.125 | .270** | .489** | 1 | | | | | | | | | | | | | | | | |
| | AOSCS Congruence | 12 | -.174* | -0.090 | -.214** | -0.116 | -0.140 | -.164* | .561** | .550** | .542** | .545** | .662** | 1 | | | | | | | | | | | | | | | |
| CART-Q | Commitment | 13 | .532** | .545** | .573** | .594** | .529** | .640** | -.310** | 0.107 | -.156* | -.241** | -.321** | -.249** | 1 | | | | | | | | | | | | | | |
| | Closeness | 14 | .463** | .461** | .541** | .504** | .448** | .554** | -.282** | 0.042 | -.259** | -.279** | -.289** | -.320** | .778** | 1 | | | | | | | | | | | | | |
| | Complementarity | 15 | .423** | .443** | .450** | .510** | .394** | .508** | -.238** | 0.032 | -.159* | -.174* | -.194** | -.218** | .789** | .837** | 1 | | | | | | | | | | | | |
| BNSSS | Competence | 16 | .213** | .270** | .315** | .304** | .337** | .336** | -0.065 | 0.091 | 0.085 | -0.119 | -0.146 | -0.078 | .397** | .308** | .330** | 1 | | | | | | | | | | | |
| | Autonomy Choice | 17 | .455** | .242** | .297** | .318** | .362** | .390** | -.282** | 0.064 | -0.048 | -.185* | -.189* | -0.122 | .367** | .334** | .366** | .442** | 1 | | | | | | | | | | |
| | Autonomy IPLOC | 18 | .315** | .319** | .332** | .388** | .285** | .374** | -0.144 | 0.039 | -0.067 | -0.081 | -.171* | -.149* | .591** | .560** | .638** | .542** | .435** | 1 | | | | | | | | | |
| | Autonomy Volition | 19 | .206** | 0.076 | 0.135 | 0.067 | 0.094 | 0.133 | -.153* | 0.056 | -0.022 | -0.021 | -0.083 | -0.066 | .210** | .265** | .243** | 0.110 | .315** | .444** | 1 | | | | | | | | |
| | Relatedness | 20 | .500** | .327** | .298** | .349** | .362** | .432** | -.318** | 0.133 | -0.034 | -0.140 | -.247** | -0.127 | .501** | .450** | .436** | .430** | .487** | .525** | .294** | 1 | | | | | | | |
| PNTS | Autonomy | 21 | -.242** | -0.145 | -.178* | -.232** | -0.108 | -.199** | .172* | -0.053 | 0.038 | 0.042 | -0.015 | 0.051 | -.294** | -.300** | -.393** | -.213** | -.391** | -.416** | -.354** | -.307** | 1 | | | | | | |
| | Competence | 22 | -0.110 | -0.048 | -0.141 | -0.119 | -0.012 | -0.085 | 0.071 | -0.063 | 0.086 | 0.107 | -0.078 | 0.020 | -.214** | -.211** | -.270** | -.240** | -.295** | -.409** | -.362** | -.223** | .711** | 1 | | | | | |
| | Relatedness | 23 | -0.062 | 0.005 | -0.034 | -0.051 | 0.004 | -0.025 | 0.002 | -0.029 | 0.048 | 0.084 | -0.070 | -0.024 | -0.126 | -0.126 | -.154* | -.207** | -0.140 | -.300** | -.147* | -.290** | .538** | .703** | 1 | | | | |
| Additional | BC1 | 24 | .369** | .352** | .384** | .435** | .315** | .421** | -.314** | 0.037 | -0.113 | -.212** | -.221** | -.225** | .680** | .713** | .784** | .274** | .326** | .530** | .219** | .418** | -.310** | -.304** | -.157* | 1 | | | |
| | BC2 | 25 | .526** | .514** | .481** | .516** | .477** | .586** | -.272** | 0.002 | -0.138 | -.171* | -.218** | -.222** | .773** | .698** | .778** | .383** | .364** | .575** | .152* | .490** | -.261** | -.187* | -0.085 | .722** | 1 | | |
| | SC | 26 | .180* | .278** | .224** | .154* | .178* | .243** | -0.058 | 0.092 | -0.027 | -0.040 | -0.063 | -0.012 | .340** | .301** | .281** | .449** | .323** | .569** | .329** | .397** | -.234** | -.292** | -0.132 | .286** | .349** | 1 | |
| | SE | 27 | .264** | .306** | .259** | .215** | .274** | .316** | -0.139 | 0.137 | -0.036 | -0.051 | -0.071 | 0.005 | .384** | .386** | .356** | .368** | .212** | .541** | .326** | .454** | -.188* | -.200** | -.167* | .328** | .424** | .631** | 1 |

***Note:*** CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; *$p < .05$, ** $p < .010$.

**Table 2.5** Correlation analysis of coaches' ($n$ = 41) adult-oriented coaching practice variables, Masters Athletes' quality sport experience outcome variables, and congruence.

| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AOSCS | CIA | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | FLS | 2 | .419** | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ICK | 3 | .620** | .545** | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| | RPE | 4 | .595** | .432** | .559** | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| | CPP | 5 | .719** | .636** | .577** | .686** | 1 | | | | | | | | | | | | | | | | | | | | | | |
| | AOSCS | 6 | .795** | .810** | .757** | .749** | .916** | 1 | | | | | | | | | | | | | | | | | | | | | |
| Congruence | CIA Congruence | 7 | -.398** | -0.199 | -0.195 | -0.307 | -0.254 | -.319* | 1 | | | | | | | | | | | | | | | | | | | | |
| | FLS Congruence | 8 | -0.114 | -.368* | -0.069 | -0.061 | -0.279 | -0.272 | 0.255 | 1 | | | | | | | | | | | | | | | | | | | |
| | ICK Congruence | 9 | -0.030 | 0.154 | -0.171 | -0.123 | 0.042 | 0.020 | .357* | 0.171 | 1 | | | | | | | | | | | | | | | | | | |
| | RPE Congruence | 10 | -0.030 | -0.068 | -0.201 | -.343* | -0.098 | -0.143 | 0.263 | 0.126 | .509** | 1 | | | | | | | | | | | | | | | | | |
| | CPP Congruence | 11 | -0.138 | -0.168 | 0.026 | -0.167 | -0.271 | -0.205 | .394* | 0.200 | 0.301 | .576** | 1 | | | | | | | | | | | | | | | | |
| | AOSCS Congruence | 12 | -0.283 | -0.072 | -0.049 | -0.194 | -0.276 | -0.219 | .510** | .547** | .585** | .591** | .715** | 1 | | | | | | | | | | | | | | | |
| CART-Q | Commitment | 13 | 0.099 | 0.100 | -0.084 | -0.008 | 0.101 | 0.079 | -0.179 | 0.116 | 0.051 | -0.137 | -.359* | -0.022 | 1 | | | | | | | | | | | | | | |
| | Closeness | 14 | 0.215 | 0.237 | 0.034 | 0.083 | 0.199 | 0.217 | -0.218 | -0.105 | -0.023 | -0.154 | -0.275 | -0.109 | .756** | 1 | | | | | | | | | | | | | |
| | Complementarity | 15 | 0.082 | 0.161 | -0.040 | 0.042 | 0.139 | 0.124 | -0.024 | -0.036 | 0.118 | -0.032 | -0.142 | 0.097 | .810** | .823** | 1 | | | | | | | | | | | | |
| BNSSS | Competence | 16 | 0.271 | .357* | .341* | .389* | .334* | .408** | -0.261 | -0.266 | -0.084 | -0.249 | -0.305 | -.326* | 0.093 | 0.159 | 0.172 | 1 | | | | | | | | | | | |
| | Autonomy Choice | 17 | 0.266 | .379* | 0.243 | .326* | .366* | .403** | -0.144 | -0.084 | -0.024 | -0.109 | -0.287 | -0.133 | 0.151 | 0.113 | 0.280 | .508** | 1 | | | | | | | | | | |
| | Autonomy IPLOC | 18 | 0.144 | 0.236 | 0.174 | 0.188 | 0.122 | 0.210 | -0.058 | 0.005 | -0.082 | -0.154 | -0.224 | -0.071 | .330* | .358* | .416** | .633** | .528** | 1 | | | | | | | | | |
| | Autonomy Volition | 19 | 0.101 | -0.003 | 0.152 | 0.131 | 0.190 | 0.129 | -0.119 | 0.118 | -0.284 | -0.270 | -0.236 | -0.158 | 0.172 | 0.167 | 0.214 | 0.254 | .437** | .475** | 1 | | | | | | | | |
| | Relatedness | 20 | 0.301 | 0.255 | 0.067 | .327* | 0.280 | .311* | -0.133 | 0.156 | 0.269 | 0.091 | -0.276 | 0.129 | .386* | .325* | 0.274 | 0.143 | 0.247 | 0.268 | 0.003 | 1 | | | | | | | |
| PNTS | Autonomy | 21 | -0.057 | -0.034 | -0.072 | -0.081 | -0.045 | -0.062 | 0.016 | -0.150 | -0.123 | -0.068 | -0.098 | -0.260 | -0.237 | -0.302 | -.492** | -0.265 | -.631** | -.388* | -0.301 | -0.166 | 1 | | | | | | |
| | Competence | 22 | -0.093 | -0.012 | -0.207 | -0.114 | -0.029 | -0.082 | 0.014 | -0.148 | 0.159 | 0.121 | -0.048 | -0.067 | -0.034 | -0.123 | -0.214 | -.398** | -.442** | -.595** | -.564** | 0.064 | .704** | 1 | | | | | |
| | Relatedness | 23 | 0.018 | 0.004 | -0.161 | -0.119 | 0.073 | -0.010 | -0.033 | -0.193 | 0.102 | -0.090 | -0.195 | -0.219 | 0.122 | 0.055 | -0.014 | -.373* | -0.240 | -.564** | -.325* | -0.013 | .506** | .811** | 1 | | | | |
| Additional | BC1 | 24 | -0.066 | 0.209 | -0.060 | -0.090 | 0.088 | 0.069 | 0.132 | -0.148 | 0.191 | -0.049 | -0.091 | 0.113 | .627** | .605** | .809** | 0.187 | .314* | .349* | 0.267 | 0.167 | -.465** | -0.247 | -0.084 | 1 | | | |
| | BC2 | 25 | 0.183 | 0.247 | 0.068 | 0.147 | 0.290 | 0.260 | -0.119 | -0.168 | 0.008 | -0.144 | -0.220 | -0.036 | .724** | .724** | .793** | 0.250 | .358* | .377* | .364* | 0.261 | -.392* | -0.219 | -0.046 | .821** | 1 | | |
| | SC | 26 | -0.071 | 0.222 | 0.175 | 0.052 | -0.040 | 0.082 | 0.084 | -0.040 | -0.058 | -0.238 | -0.131 | 0.053 | .313* | 0.221 | .323* | .465** | .406** | .499** | 0.259 | 0.095 | -0.201 | -0.227 | -0.086 | .437** | .313* | 1 | |
| | SE | 27 | 0.102 | 0.173 | 0.144 | 0.137 | 0.180 | 0.188 | 0.040 | 0.167 | 0.063 | 0.071 | 0.014 | 0.223 | 0.294 | .328* | .329* | .313* | 0.100 | .570** | .387* | .324* | -0.161 | -.321* | -.433** | .315* | .335* | .347* | 1 |

***Note:*** CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; *$p < .05$, ** $p < .010$.

**Table 2.6** Standardized total, direct, and specific indirect effects of congruence as the mediator on the relationships between Masters Athletes' (MAs) perceptions of their coaches' *general* and *specific* use of adult-oriented coaching practices and MAs' quality sport experience outcomes.

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| *CART-Q* | CIA → Commitment | 0.532 | 0.000 | 0.022 | 0.651 | -.061, .240 | 0.510 | 0.000 |
| | CIA → Closeness | 0.463 | 0.000 | 0.028 | 0.614 | -.073, .194 | 0.435 | 0.000 |
| | CIA → Complementarity | 0.423 | 0.000 | 0.011 | 0.839 | -.166, .117 | 0.411 | 0.000 |
| *BNSSS* | CIA → Competence | 0.213 | 0.006 | -0.035 | 0.453 | -.055, .264 | 0.249 | 0.002 |
| | CIA → Autonomy Choice | 0.455 | 0.000 | 0.031 | 0.477 | -.102, .199 | 0.424 | 0.000 |
| | CIA → Autonomy IPLOC | 0.315 | 0.000 | -0.017 | 0.755 | -.107, .153 | 0.332 | 0.000 |
| | CIA → Autonomy Volition | 0.206 | 0.006 | 0.032 | 0.490 | -.150, .319 | 0.174 | 0.022 |
| | CIA → Relatedness | 0.500 | 0.000 | 0.040 | 0.387 | -.181, .140 | 0.460 | 0.000 |
| *PNTS* | CIA → Autonomy | -0.242 | 0.001 | -0.032 | 0.475 | -.131, .142 | -0.211 | 0.009 |
| | CIA → Competence | -0.110 | 0.108 | -0.010 | 0.802 | -.182, .135 | -0.100 | 0.169 |
| | CIA → Relatedness | -0.062 | 0.245 | 0.022 | 0.493 | -.135, .119 | -0.085 | 0.124 |
| *Additional* | CIA → BC1 | 0.369 | 0.000 | 0.087 | 0.076 | -.248, .077 | 0.282 | 0.000 |
| | CIA → BC2 | 0.526 | 0.000 | -0.005 | 0.926 | -.141, .193 | 0.531 | 0.000 |
| | CIA → SC | 0.180 | 0.025 | -0.027 | 0.545 | -.134, .102 | 0.207 | 0.003 |
| | CIA → SE | 0.264 | 0.011 | 0.000 | 0.994 | -.233, .114 | 0.265 | 0.001 |
| *CART-Q* | FLS → Commitment | 0.545 | 0.000 | 0.002 | 0.890 | -.419, .017 | 0.543 | 0.000 |
| | FLS → Closeness | 0.461 | 0.000 | -0.007 | 0.595 | -.176, .176 | 0.468 | 0.000 |
| | FLS → Complementarity | 0.443 | 0.000 | -0.008 | 0.576 | -.292, .103 | 0.451 | 0.000 |
| *BNSSS* | FLS → Competence | 0.270 | 0.000 | 0.008 | 0.596 | -.051, .310 | 0.262 | 0.000 |
| | FLS → Autonomy Choice | 0.242 | 0.008 | 0.004 | 0.791 | -.404, .071 | 0.238 | 0.012 |
| | FLS → Autonomy IPLOC | 0.319 | 0.000 | -0.003 | 0.820 | -.359, .059 | 0.332 | 0.000 |
| | FLS → Autonomy Volition | 0.076 | 0.342 | 0.008 | 0.544 | -.343, .035 | 0.068 | 0.400 |
| | FLS → Relatedness | 0.327 | 0.000 | 0.014 | 0.328 | -.664, .017 | 0.313 | 0.000 |
| *PNTS* | FLS → Autonomy | -0.145 | 0.050 | -0.005 | 0.694 | -.017, .478 | -0.140 | 0.064 |
| | FLS → Competence | -0.048 | 0.546 | -0.010 | 0.383 | -.017, .402 | -0.038 | 0.638 |
| | FLS → Relatedness | 0.005 | 0.921 | -0.005 | 0.634 | -.020, .416 | 0.011 | 0.846 |
| *Additional* | FLS → BC1 | 0.352 | 0.000 | -0.005 | 0.763 | -.085, .334 | 0.357 | 0.000 |
| | FLS → BC2 | 0.514 | 0.000 | -0.016 | 0.337 | -.091, .236 | 0.531 | 0.000 |
| | FLS → SC | 0.278 | 0.000 | 0.008 | 0.496 | -.326, .137 | 0.271 | 0.000 |
| | FLS → SE | 0.306 | 0.000 | 0.015 | 0.265 | -.483, .014 | 0.291 | 0.000 |
| *CART-Q* | ICK → Commitment | 0.573 | 0.000 | 0.009 | 0.587 | -.164, .056 | 0.564 | 0.000 |
| | ICK → Closeness | 0.541 | 0.000 | 0.031 | 0.178 | -.060, .138 | 0.510 | 0.000 |
| | ICK → Complementarity | 0.450 | 0.000 | 0.015 | 0.437 | -.193, .025 | 0.435 | 0.000 |
| *BNSSS* | ICK → Competence | 0.315 | 0.000 | -0.030 | 0.169 | -.055, .116 | 0.345 | 0.000 |
| | ICK → Autonomy Choice | 0.297 | 0.000 | -0.002 | 0.904 | -.117, .066 | 0.299 | 0.000 |
| | ICK → Autonomy IPLOC | 0.332 | 0.000 | 0.000 | 0.983 | -.043, .139 | 0.332 | 0.000 |
| | ICK → Autonomy Volition | 0.135 | 0.051 | -0.001 | 0.955 | -.026, .282 | 0.136 | 0.051 |

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| | ICK → Relatedness | 0.298 | 0.000 | -0.005 | 0.760 | -.290, .037 | 0.303 | 0.000 |
| *PNTS* | ICK → Autonomy | -0.178 | 0.024 | -0.001 | 0.967 | -.031, .188 | -0.178 | 0.026 |
| *PNTS* | ICK → Competence | -0.141 | 0.087 | -0.012 | 0.534 | -.204, .033 | -0.129 | 0.132 |
| *PNTS* | ICK → Relatedness | -0.034 | 0.645 | -0.008 | 0.677 | -.155, .036 | -0.025 | 0.768 |
| *Additional* | ICK → BC1 | 0.384 | 0.000 | 0.008 | 0.691 | -.218, .023 | 0.377 | 0.000 |
| *Additional* | ICK → BC2 | 0.481 | 0.000 | 0.009 | 0.551 | -.107, .057 | 0.472 | 0.000 |
| *Additional* | ICK → SC | 0.224 | 0.005 | -0.003 | 0.829 | -.045, .131 | 0.228 | 0.005 |
| *Additional* | ICK → SE | 0.259 | 0.000 | -0.003 | 0.850 | -.155, .028 | 0.262 | 0.001 |
| *CART-Q* | RPE → Commitment | 0.594 | 0.000 | 0.025 | 0.184 | -.047, .242 | 0.569 | 0.000 |
| *CART-Q* | RPE → Closeness | 0.504 | 0.000 | 0.037 | 0.124 | -.053, .201 | 0.467 | 0.000 |
| *CART-Q* | RPE → Complementarity | 0.510 | 0.000 | 0.015 | 0.414 | -.128, .123 | 0.495 | 0.000 |
| *BNSSS* | RPE → Competence | 0.304 | 0.000 | 0.012 | 0.496 | -.032, .206 | 0.292 | 0.000 |
| *BNSSS* | RPE → Autonomy Choice | 0.318 | 0.000 | 0.025 | 0.161 | -.123, .152 | 0.293 | 0.000 |
| *BNSSS* | RPE → Autonomy IPLOC | 0.388 | 0.000 | 0.001 | 0.940 | -.055, .225 | 0.386 | 0.000 |
| *BNSSS* | RPE → Autonomy Volition | 0.067 | 0.287 | 0.002 | 0.917 | -.055, .380 | 0.065 | 0.311 |
| *BNSSS* | RPE → Relatedness | 0.349 | 0.000 | 0.015 | 0.383 | -.355, .034 | 0.334 | 0.000 |
| *PNTS* | RPE → Autonomy | -0.232 | 0.001 | 0.001 | 0.966 | -.041, .192 | -0.233 | 0.001 |
| *PNTS* | RPE → Competence | -0.119 | 0.108 | -0.017 | 0.373 | -.264, .069 | -0.102 | 0.192 |
| *PNTS* | RPE → Relatedness | -0.051 | 0.503 | -0.015 | 0.432 | -.021, .172 | -0.036 | 0.673 |
| *Additional* | RPE → BC1 | 0.435 | 0.000 | 0.026 | 0.239 | -.061, .188 | 0.409 | 0.000 |
| *Additional* | RPE → BC2 | 0.516 | 0.000 | 0.014 | 0.405 | -.057, .204 | 0.501 | 0.000 |
| *Additional* | RPE → SC | 0.154 | 0.012 | 0.002 | 0.905 | -.011, .285 | 0.152 | 0.018 |
| *Additional* | RPE → SE | 0.215 | 0.001 | 0.002 | 0.910 | -.232, .025 | 0.213 | 0.002 |
| *CART-Q* | CPP → Commitment | 0.529 | 0.000 | 0.054 | 0.073 | -.014, .313 | 0.475 | 0.000 |
| *CART-Q* | CPP → Closeness | 0.448 | 0.000 | 0.051 | 0.118 | -.020, .301 | 0.397 | 0.000 |
| *CART-Q* | CPP → Complementarity | 0.394 | 0.000 | 0.025 | 0.419 | -.033, .201 | 0.369 | 0.000 |
| *BNSSS* | CPP → Competence | 0.337 | 0.000 | 0.014 | 0.539 | -.016, .259 | 0.323 | 0.000 |
| *BNSSS* | CPP → Autonomy Choice | 0.362 | 0.000 | 0.026 | 0.289 | -.016, .225 | 0.336 | 0.000 |
| *BNSSS* | CPP → Autonomy IPLOC | 0.285 | 0.000 | 0.028 | 0.297 | -.025, .265 | 0.254 | 0.001 |
| *BNSSS* | CPP → Autonomy Volition | 0.094 | 0.147 | 0.019 | 0.474 | -.028, .293 | 0.076 | 0.269 |
| *BNSSS* | CPP → Relatedness | 0.362 | 0.000 | 0.046 | 0.064 | -.035, .266 | 0.316 | 0.000 |
| *PNTS* | CPP → Autonomy | -0.108 | 0.117 | 0.017 | 0.496 | -.031, .204 | -0.125 | 0.084 |
| *PNTS* | CPP → Competence | -0.012 | 0.863 | 0.028 | 0.224 | -.075, .162 | -0.040 | 0.576 |
| *PNTS* | CPP → Relatedness | 0.004 | 0.954 | 0.024 | 0.287 | -.022, .215 | -0.019 | 0.795 |
| *Additional* | CPP → BC1 | 0.315 | 0.000 | 0.042 | 0.208 | -.047, .165 | 0.273 | 0.000 |
| *Additional* | CPP → BC2 | 0.477 | 0.000 | 0.024 | 0.346 | -.023, .210 | 0.453 | 0.000 |
| *Additional* | CPP → SC | 0.178 | 0.018 | 0.003 | 0.915 | -.013, .214 | 0.176 | 0.018 |
| *Additional* | CPP → SE | 0.247 | 0.000 | -0.005 | 0.848 | -.180, .047 | 0.278 | 0.000 |
| *CART-Q* | AOSCS → Commitment | 0.640 | 0.000 | 0.024 | 0.207 | -.001, .078 | 0.615 | 0.000 |
| *CART-Q* | AOSCS → Closeness | 0.554 | 0.000 | 0.039 | 0.148 | .000, .106 | 0.516 | 0.000 |

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| | AOSCS → Complementarity | 0.508 | 0.000 | 0.023 | 0.261 | -.001, .080 | 0.486 | 0.000 |
| *BNSSS* | AOSCS → Competence | 0.336 | 0.000 | 0.004 | 0.750 | -.015, .039 | 0.332 | 0.000 |
| *BNSSS* | AOSCS → Autonomy Choice | 0.390 | 0.000 | 0.010 | 0.470 | -.008, .049 | 0.381 | 0.000 |
| *BNSSS* | AOSCS → Autonomy IPLOC | 0.374 | 0.000 | 0.015 | 0.339 | -.003, .063 | 0.359 | 0.000 |
| *BNSSS* | AOSCS → Autonomy Volition | 0.133 | 0.061 | 0.007 | 0.585 | -.010, .051 | 0.125 | 0.074 |
| *BNSSS* | AOSCS → Relatedness | 0.432 | 0.000 | 0.010 | 0.457 | -.008, .048 | 0.422 | 0.000 |
| *PNTS* | AOSCS → Autonomy | -0.199 | 0.005 | -0.003 | 0.817 | -.042, .016 | -0.196 | 0.006 |
| *PNTS* | AOSCS → Competence | -0.085 | 0.269 | -0.001 | 0.934 | -.031, .020 | -0.084 | 0.284 |
| *PNTS* | AOSCS → Relatedness | -0.025 | 0.719 | 0.005 | 0.662 | -.011, .036 | -0.029 | 0.676 |
| *Additional* | AOSCS → BC1 | 0.421 | 0.000 | 0.026 | 0.240 | -.001, .090 | 0.395 | 0.000 |
| *Additional* | AOSCS → BC2 | 0.586 | 0.000 | 0.021 | 0.179 | .000, .064 | 0.565 | 0.000 |
| *Additional* | AOSCS → SC | 0.243 | 0.001 | -0.005 | 0.706 | -.042, .011 | 0.248 | 0.000 |
| *Additional* | AOSCS → SE | 0.316 | 0.000 | -0.010 | 0.507 | -.055, .008 | 0.326 | 0.000 |

***Note:*** CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; AOSCS = *general* adult-oriented coaching practices.

**Table 2.7** Standardized total, direct, and specific indirect effects of congruence as the mediator on the relationships between coaches' perceptions of their *general* and *specific* use of adult-oriented coaching practices and Masters Athletes' quality sport experience outcomes.

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| *CART-Q* | CIA → Commitment | 0.099 | 0.535 | 0.066 | 0.370 | -.061, .240 | 0.033 | 0.851 |
| | CIA → Closeness | 0.215 | 0.283 | 0.063 | 0.354 | -.073, .194 | 0.153 | 0.486 |
| | CIA → Complementarity | 0.082 | 0.619 | -0.004 | 0.956 | -.166, .117 | 0.086 | 0.621 |
| *BNSSS* | CIA → Competence | 0.271 | 0.064 | 0.072 | 0.357 | -.055, .264 | 0.199 | 0.191 |
| | CIA → Autonomy Choice | 0.266 | 0.023 | 0.018 | 0.805 | -.102, .199 | 0.248 | 0.012 |
| | CIA → Autonomy IPLOC | 0.144 | 0.314 | 0.000 | 0.998 | -.107, .153 | 0.144 | 0.300 |
| | CIA → Autonomy Volition | 0.101 | 0.555 | 0.037 | 0.750 | -.150, .319 | 0.064 | 0.647 |
| | CIA → Relatedness | 0.301 | 0.077 | 0.006 | 0.936 | -.181, .140 | 0.295 | 0.099 |
| *PNTS* | CIA → Autonomy | -0.057 | 0.621 | 0.003 | 0.964 | -.131, .142 | -0.060 | 0.641 |
| | CIA → Competence | -0.093 | 0.503 | 0.011 | 0.884 | -.182, .135 | -0.104 | 0.404 |
| | CIA → Relatedness | 0.018 | 0.896 | 0.012 | 0.850 | -.135, .119 | 0.006 | 0.966 |
| *Additional* | CIA → BC1 | -0.066 | 0.602 | -0.050 | 0.529 | -.248, .077 | -0.016 | 0.915 |
| | CIA → BC2 | 0.182 | 0.189 | 0.022 | 0.793 | -.141, .193 | 0.161 | 0.278 |
| | CIA → SC | -0.071 | 0.627 | -0.026 | 0.657 | -.134, .102 | -0.045 | 0.739 |
| | CIA → SE | 0.102 | 0.418 | -0.038 | 0.655 | -.233, .114 | 0.141 | 0.306 |
| *CART-Q* | FLS → Commitment | 0.100 | 0.477 | -0.065 | 0.560 | -.419, .018 | 0.166 | 0.313 |
| | FLS → Closeness | 0.237 | 0.073 | 0.008 | 0.946 | -.176, .175 | 0.229 | 0.216 |
| | FLS → Complementarity | 0.161 | 0.251 | -0.010 | 0.904 | -.292, .103 | 0.171 | 0.301 |
| *BNSSS* | FLS → Competence | 0.357 | 0.005 | 0.057 | 0.525 | -.051, .310 | 0.300 | 0.074 |
| | FLS → Autonomy Choice | 0.379 | 0.005 | -0.024 | 0.814 | -.404, .071 | 0.403 | 0.003 |
| | FLS → Autonomy IPLOC | 0.236 | 0.104 | -0.039 | 0.671 | -.359, .059 | 0.275 | 0.032 |
| | FLS → Autonomy Volition | -0.003 | 0.975 | -0.050 | 0.580 | -.343, .035 | 0.046 | 0.710 |
| | FLS → Relatedness | 0.255 | 0.032 | -0.106 | 0.535 | -.664, .017 | 0.361 | 0.055 |
| *PNTS* | FLS → Autonomy | -0.034 | 0.842 | 0.069 | 0.549 | -.017, .478 | -0.103 | 0.588 |
| | FLS → Competence | -0.012 | 0.924 | 0.065 | 0.497 | -.017, .402 | -0.077 | 0.599 |
| | FLS → Relatedness | 0.004 | 0.969 | 0.082 | 0.464 | -.020, .416 | -0.078 | 0.557 |
| *Additional* | FLS → BC1 | 0.209 | 0.153 | 0.030 | 0.756 | -.085, .334 | 0.178 | 0.213 |
| | FLS → BC2 | 0.247 | 0.068 | 0.033 | 0.746 | -.091, .236 | 0.214 | 0.166 |
| | FLS → SC | 0.222 | 0.133 | -0.018 | 0.862 | -.326, .137 | 0.240 | 0.140 |
| | FLS → SE | 0.173 | 0.208 | -0.099 | 0.435 | -.483, .014 | 0.272 | 0.072 |
| *CART-Q* | ICK → Commitment | -0.084 | 0.546 | -0.007 | 0.890 | -.164, .056 | -0.077 | 0.627 |
| | ICK → Closeness | 0.034 | 0.861 | 0.003 | 0.944 | -.060, .138 | 0.031 | 0.884 |
| | ICK → Complementarity | -0.040 | 0.778 | -0.020 | 0.680 | -.193, .025 | -0.021 | 0.895 |
| *BNSSS* | ICK → Competence | 0.341 | 0.022 | 0.004 | 0.915 | -.055, .116 | 0.337 | 0.029 |
| | ICK → Autonomy Choice | 0.243 | 0.059 | -0.003 | 0.944 | -.117, .066 | 0.246 | 0.040 |
| | ICK → Autonomy IPLOC | 0.174 | 0.099 | 0.009 | 0.820 | -.043, .139 | 0.165 | 0.122 |
| | ICK → Autonomy Volition | 0.152 | 0.460 | 0.045 | 0.546 | -.026, .282 | 0.107 | 0.522 |

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| | ICK → Relatedness | 0.067 | 0.721 | -0.049 | 0.527 | -.290, .037 | 0.116 | 0.506 |
| *PNTS* | ICK → Autonomy | -0.072 | 0.571 | 0.024 | 0.617 | -.031, .188 | -0.096 | 0.472 |
| *PNTS* | ICK → Competence | -0.207 | 0.162 | -0.022 | 0.690 | -.204, .033 | -0.186 | 0.191 |
| *PNTS* | ICK → Relatedness | -0.161 | 0.140 | -0.013 | 0.742 | -.155, .036 | -0.148 | 0.216 |
| *Additional* | ICK → BC1 | -0.060 | 0.624 | -0.032 | 0.554 | -.218, .023 | -0.028 | 0.821 |
| *Additional* | ICK → BC2 | 0.068 | 0.570 | -0.004 | 0.926 | -.107, .057 | 0.072 | 0.588 |
| *Additional* | ICK → SC | 0.175 | 0.108 | 0.005 | 0.896 | -.045, .131 | 0.171 | 0.142 |
| *Additional* | ICK → SE | 0.144 | 0.211 | -0.015 | 0.705 | -.155, .028 | 0.159 | 0.152 |
| *CART-Q* | RPE → Commitment | -0.008 | 0.958 | 0.054 | 0.452 | -.047, .242 | -0.062 | 0.726 |
| *CART-Q* | RPE → Closeness | 0.083 | 0.702 | 0.049 | 0.436 | -.053, .201 | 0.034 | 0.884 |
| *CART-Q* | RPE → Complementarity | 0.042 | 0.782 | 0.007 | 0.912 | -.128, .123 | 0.036 | 0.842 |
| *BNSSS* | RPE → Competence | 0.389 | 0.005 | 0.045 | 0.439 | -.032, .206 | 0.345 | 0.010 |
| *BNSSS* | RPE → Autonomy Choice | 0.326 | 0.008 | -0.001 | 0.988 | -.123, .152 | 0.327 | 0.003 |
| *BNSSS* | RPE → Autonomy IPLOC | 0.188 | 0.169 | 0.035 | 0.599 | -.055, .225 | 0.154 | 0.238 |
| *BNSSS* | RPE → Autonomy Volition | 0.131 | 0.516 | 0.087 | 0.431 | -.055, .380 | 0.044 | 0.770 |
| *BNSSS* | RPE → Relatedness | 0.327 | 0.045 | -0.079 | 0.414 | -.355, .034 | 0.406 | 0.004 |
| *PNTS* | RPE → Autonomy | -0.081 | 0.533 | 0.037 | 0.505 | -.041, .192 | -0.118 | 0.427 |
| *PNTS* | RPE → Competence | -0.114 | 0.447 | -0.032 | 0.686 | -.264, .069 | -0.083 | 0.532 |
| *PNTS* | RPE → Relatedness | -0.119 | 0.372 | 0.051 | 0.285 | -.021, .172 | -0.169 | 0.198 |
| *Additional* | RPE → BC1 | -0.090 | 0.473 | 0.031 | 0.597 | -.061, .188 | -0.121 | 0.391 |
| *Additional* | RPE → BC2 | 0.147 | 0.318 | 0.037 | 0.550 | -.057, .204 | 0.111 | 0.510 |
| *Additional* | RPE → SC | 0.052 | 0.735 | 0.085 | 0.229 | -.011, .285 | -0.033 | 0.840 |
| *Additional* | RPE → SE | 0.137 | 0.260 | -0.046 | 0.443 | -.232, .025 | 0.183 | 0.123 |
| *CART-Q* | CPP → Commitment | 0.101 | 0.477 | 0.097 | 0.213 | -.014, .313 | 0.004 | 0.978 |
| *CART-Q* | CPP → Closeness | 0.199 | 0.247 | 0.065 | 0.356 | -.020, .301 | 0.135 | 0.490 |
| *CART-Q* | CPP → Complementarity | 0.139 | 0.346 | 0.031 | 0.561 | -.033, .201 | 0.108 | 0.512 |
| *BNSSS* | CPP → Competence | 0.334 | 0.023 | 0.063 | 0.349 | -.016, .259 | 0.271 | 0.068 |
| *BNSSS* | CPP → Autonomy Choice | 0.366 | 0.002 | 0.055 | 0.335 | -.016, .225 | 0.311 | 0.002 |
| *BNSSS* | CPP → Autonomy IPLOC | 0.122 | 0.447 | 0.056 | 0.423 | -.025, .265 | 0.066 | 0.624 |
| *BNSSS* | CPP → Autonomy Volition | 0.190 | 0.254 | 0.054 | 0.475 | -.028, .293 | 0.135 | 0.365 |
| *BNSSS* | CPP → Relatedness | 0.280 | 0.137 | 0.058 | 0.419 | -.035, .266 | 0.222 | 0.225 |
| *PNTS* | CPP → Autonomy | -0.045 | 0.776 | 0.032 | 0.553 | -.031, .204 | -0.078 | 0.628 |
| *PNTS* | CPP → Competence | -0.029 | 0.865 | 0.016 | 0.775 | -.075, .162 | -0.046 | 0.772 |
| *PNTS* | CPP → Relatedness | 0.073 | 0.666 | 0.051 | 0.370 | -.022, .215 | 0.022 | 0.898 |
| *Additional* | CPP → BC1 | 0.088 | 0.534 | 0.020 | 0.689 | -.047, .165 | 0.069 | 0.659 |
| *Additional* | CPP → BC2 | 0.290 | 0.017 | 0.041 | 0.434 | -.023, .210 | 0.248 | 0.066 |
| *Additional* | CPP → SC | -0.040 | 0.778 | 0.042 | 0.417 | -.013, .214 | -0.081 | 0.576 |
| *Additional* | CPP → SE | 0.180 | 0.196 | -0.019 | 0.718 | -.180, .047 | 0.199 | 0.137 |
| *CART-Q* | AOSCS → Commitment | 0.079 | 0.575 | 0.001 | 0.985 | -.093, .114 | 0.078 | 0.624 |
| *CART-Q* | AOSCS → Closeness | 0.217 | 0.224 | 0.014 | 0.726 | -.039, .127 | 0.203 | 0.287 |

| | | Total | | Specific Indirect | | | Direct | |
|---|---|---|---|---|---|---|---|---|
| | | *β* | *p* | *β* | *p* | 95% CI | *β* | *p* |
| | AOSCS → Complementarity | 0.124 | 0.386 | -0.029 | 0.561 | -.200, .023 | 0.152 | 0.336 |
| *BNSSS* | AOSCS → Competence | 0.408 | 0.003 | 0.054 | 0.335 | -.015, .218 | 0.354 | 0.006 |
| *BNSSS* | AOSCS → Autonomy Choice | 0.403 | 0.000 | 0.010 | 0.814 | -.045, .145 | 0.393 | 0.000 |
| *BNSSS* | AOSCS → Autonomy IPLOC | 0.210 | 0.136 | 0.006 | 0.901 | -.059, .126 | 0.204 | 0.128 |
| *BNSSS* | AOSCS → Autonomy Volition | 0.129 | 0.493 | 0.030 | 0.692 | -.064, .254 | 0.099 | 0.475 |
| *BNSSS* | AOSCS → Relatedness | 0.311 | 0.057 | -0.045 | 0.504 | -.271, .022 | 0.356 | 0.020 |
| *PNTS* | AOSCS → Autonomy | -0.062 | 0.671 | 0.063 | 0.333 | -.026, .241 | -0.125 | 0.429 |
| *PNTS* | AOSCS → Competence | -0.082 | 0.587 | 0.020 | 0.724 | -.058, .184 | -0.101 | 0.488 |
| *PNTS* | AOSCS → Relatedness | -0.010 | 0.942 | 0.051 | 0.325 | -.032, .179 | -0.060 | 0.658 |
| *Additional* | AOSCS → BC1 | 0.069 | 0.590 | -0.030 | 0.545 | -.184, .025 | 0.098 | 0.456 |
| *Additional* | AOSCS → BC2 | 0.260 | 0.025 | -0.005 | 0.908 | -.114, .063 | 0.265 | 0.033 |
| *Additional* | AOSCS → SC | 0.082 | 0.562 | -0.016 | 0.649 | -.113, .031 | 0.098 | 0.491 |
| *Additional* | AOSCS → SE | 0.188 | 0.132 | -0.061 | 0.313 | -.220, .024 | 0.249 | 0.029 |

***Note:*** CART-Q = Coach-Athlete Relationship Questionnaire; BNSSS = Basic Needs Satisfaction in Sport Scale; PNTS = Psychological Needs Thwarting Scale; CIA = Considering the Individuality of Athletes; FLS = Framing Learning Situations; ICK = Imparting Coaching Knowledge; RPE = Respecting Preferences for Effort, Accountability, and Feedback; CPP = Creating Personalized Programming; AOSCS = Athletes' general adult-oriented coaching practice scores; IPLOC = Internal perceived locus of causality (autonomy); BC1 = "Because of my coach, I like to go to practice"; BC2 = "Because of my coach, I want to invest more in my sport"; SC = "I am committed to keep doing my sport"; SE = "I find participating in sport to be very enjoyable"; AOSCS = *general* adult-oriented coaching practices.

## Chapter 4: General Discussion

The general purpose of this thesis was to examine the effectiveness of adult-oriented coaching practices regarding the quality of Masters athletes' (MAs) sports experiences. Two research questions guided this thesis: (a) Do adult-oriented coaching practices predict outcomes related to a quality Master sport experience (QMSE)? (b) Are the relationships between adult-oriented coaching practices and QMSE outcomes dependent on the level of congruence between MAs and their coaches? These research questions were addressed through two studies. By addressing the research questions, the results from this thesis make notable contributions to our understanding of how adult-oriented coaching practices are related to a QMSE, the assessment of a QMSE, and how adult-oriented coaching practices change over time. Additionally, the results have both methodological and theoretical implications regarding the assessment of congruency in coaching. Finally, the findings have practical implications for coaches of adult sport, competitive adult sportspersons, and adult sport policymakers.

### What is a Quality Masters Sport Experience (QMSE) for MAs?

In the sports psychology literature, "quality sport experiences" have been referred to as the penultimate outcome for athletic youth cohorts (e.g., see Cairney et al., 2018; Smith 2014) and have been studied with samples of younger cohorts as early as the 1970s (e.g., see Smith et al., 1979). What constitutes a quality sport experience in adult/Masters sport has not received the same empirical attention. The first scientific article to our knowledge that mentioned quality sport experiences for competitive adult athletes (e.g., MAs) was Langley and Knight's (1999) study. In their study, the authors attempted to contextualize the meaning and evolution of competitive adult sportspersons. The authors found that sports involvement throughout life acted as the infrastructure for an evolving sport identity and mediated adaptations to the ageing

process. What Langley and Knight did not find, however, was what a quality sport experience is for adult athletes. Since Langley and Knight's study, the notion of a quality sport experience for MAs has been referred to on several occasions (e.g., see Dionigi, 2002, 2006a; Toepell et al., 2004; Young et al., 2011), yet, until recently, it has never been operationally defined.

Recently, Young and colleagues (2021) reviewed existing literature pertaining to coaching Masters sport and offered a preliminary operational conceptualization of what a quality sport experience entails for MAs. Specifically, Young and colleagues (2021) proposed eight hallmarks of a QMSE (i.e., meaningful competition, mastery, testing and assessing oneself, quality relationships, fun and fitness, intellectual stimulation, feeling empowered, and feeling validated). By defining a QMSE, Young and colleagues (2021) set precedence for researchers to begin examining how different policies, contexts, and sports agents (e.g., coaches) can impact the quality of MAs' sport experiences.

Despite outlining the eight hallmarks of a QMSE, Young and colleagues' (2021) article was limited to descriptions alone and did not guide researchers on how to measure the eight hallmarks. Further, most of the reference materials used to conceptualize the eight hallmarks of a QMSE were qualitative. In this sense, the relevance of quantitative assessment tools that could be used to assess the hallmarks of a QMSE is unknown. The findings from this thesis add to the literature by identifying and testing criterion measures that can be used to infer a QMSE for MAs. Specifically, established quantitative items and assessment tools were used to measure five (i.e., *quality relationships*, *feeling empowered*, *feeling validated*, *mastery*, and *fun and fitness*) of the eight hallmarks of a QMSE.

***Assessing Quality Relationships***

Young and colleagues (2021) define *quality relationships* as the beneficial social connections that MAs seek within the Masters sport environment. Collectively, in studies one and two, we used the CART-Q (Jowett & Ntoumanis, 2004), items for practice-liking and investment (because of one's coach; Smith et al., 1979), and relatedness from the BNSSS (Ng et al., 2011) and PNTS (Bartholomew et al., 2011) as a rounded way to measure the *quality relationships* component of a QMSE as opposed to using these measurement tools on their own. Specifically, these measures allowed us to understand *quality relationships* as MAs' relationships with their coach (i.e., closeness, commitment, and complementarity), how MAs benefitted from their relationships with their coach (i.e., practice-liking and investment), and how MAs feel they belong in the Masters sport setting with their peers (i.e., relatedness).

***Assessing Feeling Empowered***

According to Young et al. (2021), MAs' feelings of empowerment are their feelings that their sport pursuits stem from their own decisions. In both studies in this thesis, MAs' *feelings of empowerment* were measured by the degree to which MAs were satisfied or frustrated with their autonomy. Specifically, MAs' autonomy satisfaction (using the BNSSS; Ng et al., 2011) was measured three ways: 1) MAs' decision-making flexibility to choose what to do with practice/training activities (i.e., autonomy choice); 2) whether MAs felt an unpressured willingness to engage in an activity (i.e., autonomy volition); and 3) whether MAs believed their actions came from a personal force (i.e., autonomy IPLOC). Further, MAs' feelings of autonomy thwarting or frustration were measured using the PNTS (Bartholomew et al., 2011). All four of these measures were previously validated in the Master sport setting (Hoffmann et al., 2019) when comparing coached and non-coached MAs. Therefore, in this thesis, interpreting MAs' autonomy satisfaction and thwarting using these measures provided a valid and reliable solution

to understanding the degree to which MAs may *feel empowered* in terms of their sport experiences.

***Assessing Feeling Validated***

Young and colleagues (2021) described MAs' *feelings of validation* as their inherent need to feel that their investments in sport are being reciprocated and legitimized by the quality of practice/programming and coaching they receive. In the second study in this thesis, we measured MAs' *feelings of validation* by asking them about their sport commitment. Specifically, the item that measured sport commitment was previously adopted by Bennett (2014) and was used to reliably measure MAs' functional commitment (i.e., one's desire or want to commit to sport; Wilson et al, 2004). Interestingly, previous research has shown at times that MAs' commitment is a result of the reciprocal commitment modelled by their coach and peers (Callary et al., 2015). Thus, the measure of sport commitment used in this thesis represents a way to infer that MAs are *feeling validated* with the assumption that MAs would not continue participating in sport if they felt their investments were not being reciprocated by their coach.

***Assessing Mastery***

The *mastery* component of a QMSE is defined as MAs' feelings of competency in terms of fulfilling goals, improving skills, and giving effort (Young et al., 2021). In both studies in this project, MAs' *mastery* was measured via their competence satisfaction and thwarting. Competence was the degree to which MAs' felt effective in their ongoing social interactions within the social environment and the degree to which MAs experienced opportunities to exercise and express their skills (Ng et al., 2011). In this sense, we were able to determine the degree to which MAs felt they had *mastered* their skills and interactions in the sport environment. Indeed, within sports, MAs have expressed their need to satisfy competencies by

competing against like-aged peers and pursuing personal goals and challenges (Young et al., 2014). Thus, this project added to the literature by highlighting a quantitative measure to help explain the competency satisfaction and thwarting feature of the *mastery* component of a QMSE.

### *Assessing Fun and Fitness*

In a QMSE, *fun and fitness* are described as MAs wanting to have a good time and enjoy the idea of being an athlete while being supported by a program that gets them in great shape. In the second study in this thesis, sport enjoyment was measured by asking MAs if they "find participating in sport to be very enjoyable" (Young & Medic, 2011). This item was previously used by Young & Medic (2011) to measure a sample of Masters swimmers' positive affect, liking, and fun derived from sport (Scanlan et al., 1993). Since MAs have repeatedly exclaimed that enjoyment is extremely important for their sport pursuits (e.g., Addamo et al., 2012; Dionigi, 2002, 2005, 2006b; Grant, 2001; Hastings et al., 1995; Kolt et al., 2004; Phoenix & Griffin, 2013; Roper et al., 2003; Tantrum & Hodge, 1993; Wilson, et al., 2004), having a measure of enjoyment is critical to understanding the QMSE. For this thesis, our measure of sport enjoyment provided a reliable way to determine the fun aspect of *fun and fitness* within a QMSE. Of note, in our studies, we did not address the fitness component of the *fun and fitness* hallmark. Fitness is one of the most widely cited reasons why MAs participate in and remain committed to sport (e.g., see Dionigi et al., 2013; Lyons & Dionigi, 2007; Medic, 2009; Walsh et al., 2018). Future research is needed to test how adult-oriented coaching is related to MAs' pursuit of fitness.

## Adult-Oriented Coaching Practices Are Related to Hallmarks of a QMSE

The findings from this thesis fill another gap in the literature by demonstrating quantitative relationships, throughout a season, between adult-oriented coaching practices and outcomes that assess five of Young et al.'s (2021) hallmarks of a QMSE. While Callary and

colleagues' (2017) and MacLellan and colleagues' (2019) qualitative studies linked adult-oriented coaching with features of a QMSE broadly, they often analyzed their data deductively according to Knowles et al.'s (2012) principles of andragogy. For this reason, they could not assess how adult-oriented coaching practices, in general, were related to a QMSE. Thus, by using a general AOSCS score in studies one and two, we add to the literature by showing the potential cumulative effect of the AOSCS practices (i.e., general score), and how it is positively related to all five QMSE outcomes – albeit the significant relationships were dependent on the type of analysis (i.e., cross-sectional vs. longitudinal) and perspective (i.e., coach vs. athlete data). Nevertheless, these findings suggest that when coaches use all five of the adult-oriented coaching practices as part of their craft, MAs also report having higher-quality relationships with their coach and their peers, feel more empowered, validated, and competent, and have more fun. This is an important contribution to the literature as our results support the initial claims in qualitative research regarding how adult-oriented coaching is related to a QMSE.

***AOSCS Associations with Quality Relationships***

When looking at the cross-sectional associations between general adult-oriented coaching practices and *quality relationship* outcomes, we found strong relationships (Cohen, 1988) with closeness, commitment, and complementarity in studies one and two. Similarly, we found medium sized relationships with relatedness satisfaction, small to large-sized relationships for sport investment because of one's coach, a medium-sized relationship for practice-liking because of one's coach, and a small-sized relationship for relatedness thwarting. Together, these results suggest that adult-oriented coaching is very important for MAs' relationships with their coaches (i.e., closeness, commitment, and complementarity) and peers (i.e., relatedness), and can facilitate greater enjoyment of practice and more sports investment.

Our results offer additional insight into which specific adult-oriented coaching practices are related to different *quality relationship* outcomes. For instance, two distinct practices were particularly effective at creating quality relationships between MAs and their coaches (i.e., imparting coaching knowledge and respecting preference for effort, accountability, and feedback). These results are intuitive since imparting coaching knowledge might involve intimate conversations where coaches share their relevant experiences and knowledge to help the MAs learn and develop as athletes. For example, if an athlete shares a negative experience from previous swimming pursuits, the coach could comfort MAs by sharing the same experience, or an alternative outcome from a similar experience. In this fashion, MAs and their coaches can build reciprocal trust and respect (i.e., closeness) based on their experiences (Jowett & Ntoumanis, 2004).

When coaches respect their MAs' preferences for effort, accountability, and feedback, they can also enhance their relationship with their MAs because they are reciprocally cooperating with them about their preferences and needs (i.e., complementarity; Jowett, 2007). This reciprocal communication process has previously been documented by Callary et al. (2015) when a MA who suffered from chronic arthritis noted how they appreciated that their coach would ask how they were feeling and would adjust their feedback and expectations depending on their pain level. Together, these results suggest that by listening to athletes' preferences and then personalizing the feedback given to them, coaches can create a more cooperative relationship with their MAs, whereby, MAs feel that they are being heard by their coaches.

Recently, Hoffmann and colleagues (2019) found that coached MAs have a higher sense of belongingness with their peers. When looking to facilitate quality relationships between MAs and their peers (i.e., relatedness), our results suggest that coaches who consider the individuality

of athletes and create personalized programming are effective. When a coach uses both practices, they can create programming that caters to the individual athletes' past experiences, motives, needs, and abilities and place them with similar peers. Thus, it is conceivable that MAs would feel like they belong in the sport environment with their peers, given that these practices promote more interactions with similarly skilled/experienced peers (Ferrari et al., 2016; MacLellan et al., 2017). Taken together, these findings suggest that when coaches consider their MAs' past experiences, skills, and needs when planning and delivering practices/training, MAs feel closer with their peers.

### *AOSCS Associations with Feeling Empowered*

Concerning *feeling empowered*, MAs have previously stated that they require self-direction, decisions making opportunities, and want to feel their decisions are generally their own (Callary et al., 2015; MacLellan et al., 2017). In our two studies, we found relationships between general adult-oriented coaching and autonomy choice satisfaction, autonomy volition satisfaction, autonomy IPLOC satisfaction, and autonomy thwarting, with most relationships having a medium effect size. When looking at specific coaching practices, considering the individuality of their athletes, respecting their athletes' preferences, and creating personalized programming were generally effective coaching practices that empowered MAs.

Our findings align with previous qualitative literature (e.g., Rathwell et al., 2015; MacLellan et al., 2019; Young et al., 2014) that suggests coaches should individualize their approach to fit MAs' needs and preferences, which in this case is their inherent need for autonomous decisions and choices (Gagné, 2003). For instance, MacLellan and colleagues (2019) coach described letting her MAs choose what to do sometimes so that "their feedback is heard" (p. 40). Likewise, Young et al., (2014) suggested that coaches provide their MAs with

opportunities for choice, input, and collaboration when planning and organizing training. Taken together, it appears that when coaches consider their MAs' individualities, respect their preferences for feedback, and create personalized programming, MAs' feel more empowered in their sport environment.

Interestingly, we found paradoxical results regarding MAs' autonomy and framing learning situations. Specifically, in study one, we found when MAs perceived that their coaches framed learning more often; they felt less satisfied (autonomy IPLOC and choice) and that their autonomy was being thwarted. Upon further inspection, these results are interpretable when considering the components of framing learning experience (Rathwell et al., 2020). Specifically, when coaches frame learning that challenges their MAs with modelling, problem-solving, or self-assessments, it undoubtedly will take agency away from MAs because the challenge is external to themselves. However, when we considered the perspective of the coach (i.e., their reports of framing learning situations), we saw that MAs reported being more satisfied with their autonomous abilities to make choices. Overall, this paradoxical finding shows that MAs' feelings of empowerment can vary based on whose perspective we used to assess the perception of the frequency of the coaching practice for framing learning situations. Ultimately, this paradox raises the questions as to whether the coaches' or MAs' perspectives of how often they engage in framed learning situations are more important in terms of gauging the QMSE.

***AOSCS Associations with Mastery***

Previous literature (Hodge et al., 2008; Ungerleider et al., 1989; Young, 2011) has shown MAs' desire to master abilities in the sport setting. Moreover, Hofmann et al., (2019) found that MAs who have coaches report higher perceptions of competency than MAs who do not work with coaches. When examining the relationships between coaches' general adult-oriented

coaching practices and *mastery* in our studies, we found a medium-sized relationship with competence satisfaction and a small relationship with competence thwarting. Moreover, when testing if MAs' feelings of *mastery* were related to specific practices, we found significant relationships with all five practices (dependent on the analysis).

Interestingly, some of our findings regarding *mastery* and specific coaching practices were counter to our hypotheses. For instance, at the second time point in study one, MAs felt their competence was being thwarted when coaches created personalized programming, while simultaneously reporting that their competence was being satisfied. With this said, when MAs' competence is being thwarted or frustrated, it does not guarantee that their need for competence is not being satisfied. Gunnell and colleagues (2013) have explicitly stated that BPN thwarting cannot be equated to a lack of satisfaction. In the current study, it is possible that as coaches increased training in preparation for competition, working on developing MAs' strengths, that athletes felt more competent in their abilities (Rathwell et al., 2015). However, it is also possible that as coaches began to adapt season-long plans based on the MAs' progress and perhaps identified gaps in the MAs' learning, that MAs began to become frustrated with their progress and were more aware of their weaknesses. Overall, regardless of these paradoxical findings, cross-sectional results from study two show that MAs' *mastery* can stem from each specific adult-oriented coaching practice or a combination of all adult-oriented coaching practices.

***AOSCS Associations with Fun (Enjoyment)***

Since enjoyment is one of the greatest predictors of prolonged sport investment (e.g., see Casper et al., 2007) and MAs have consistently expressed their need for enjoyment in the sport environment (e.g., see Dionigi 2002), knowing ways in which we can promote enjoyment will positively impact the sport experience. Our findings corroborate with Callary et al. (2015) by

showing that coaches are a source of MAs' enjoyment in sport. For instance, an athlete in Callary et al.'s (2015) study stated that without their coach, their swimming pursuits were "boring", and the fun came from having their coach "mix it up" (p. 5). The results from study two add to our understanding of what it means to have the coach "mix it up" by showing that coaches' use of adult-oriented coaching practices, in general, is one way to promote sport enjoyment. Moreover, our results suggest that 'mixing it up' can come from coaches specifically framing learning through problem-based discovery, modelling, assessments, and role models. This is congruent with Ferrari et al. (2016) who found that MAs enjoyed sport more because of how coaches adapted and organized challenging training throughout the season. Taken together, these results suggest that when coaches frame learning situations for their MAs, it can be challenging, but the MAs seem to embrace and enjoy these competitive scenarios as part of their sport experiences.

***AOSCS Associations with Feeling Validated***

In MacLellan's (2016) and Rathwell et al.'s (2015) studies, MAs felt more committed to their sport when perceived that they received quality programming and engagement from their coach. In our studies, we found that coaches' use of general adult-oriented coaching practices was one way that coaches could offer quality sports programming that makes MAs feel like their investments in time, money, and resources are being reciprocated, albeit the effect size was small. In terms of specific practices, coaches' use of framing learning situations for their MAs facilitated MAs' feelings of validation. MAs have generally expressed their need to feel like athletes by seeking and achieving personal challenges (e.g., goal fulfillment) and experiencing meaningful competition (Dionigi et al., 2013; Stevenson, 2002; Vallerand & Young, 2014). For this reason, it makes sense that when coaches frame learning for their MAs (i.e., modelling, self-discovery, assessments, and problem-based scenarios), they feel more validated through the

quality and challenging programming they receive. Simply put, MAs are showing up to compete, to be challenged, and to validate their investments in sport (Rathwell et al., 2015).

In sum, the findings from our two studies answered Rathwell et al.'s (2020) call to provide initial evidence for the criterion-validity of the AOSCS by demonstrating how the use of general or specific adult-oriented coaching practices can enhance aspects of MAs' sport experiences – using outcomes that are theoretically linked to the five hallmarks of a QMSE. More specifically, all the adult-oriented coaching practices found in the AOSCS were related to outcomes pertaining to five (i.e., *quality relationships, feeling empowered, feeling validated, mastery, fun and fitness*) of the eight hallmarks of a QMSE proposed by Young and colleagues (2021). Considering that survey development is a continuous validation process (Drost, 2011), future researchers should continue to test the criterion-validity AOSCS by examining the relationships between adult-oriented coaching practices and the remaining three hallmarks of a QMSE (i.e., *testing and assessing oneself, meaningful competition,* and *intellectual stimulation*)

**Congruence and Adult-Oriented Coaching Practices**

As it pertains to congruence of adult-oriented coaching practices, it appeared that congruence plays an important role in the sport experiences of MAs. This was evidenced by the cross-sectional associations between congruence and MAs QMSE outcomes. Indeed, like in previous research with younger cohorts (e.g., see Light Shields et al, 1997), our study identified that when perceptions of coaching behaviours are more closely aligned (i.e., more congruent) between coaches and athletes, the athletes see an increase in positive outcomes. In the second study of this thesis, more congruent perceptions of general adult-oriented coaching practices were associated with six outcomes (i.e., closeness, commitment, complementarity, autonomy

IPLOC, practice-liking, and sport investment), resulting in improvements in two of the five hallmarks of a QMSE (i.e., *quality relationships* and *feeling empowered*).

On the other hand, increasingly congruent perceptions of specific adult-oriented coaching practices proved to be more important than congruent general practices. For example, congruence related to considering the individuality of athletes was positively related to eight (i.e., closeness, commitment, complementarity, relatedness, practice-liking, sport investment, autonomy choice, and a reduction in autonomy thwarting) outcomes representing two of the hallmarks of a QMSE. Likewise, creating personalized programming was related to nine outcomes (i.e., closeness, commitment, complementarity, relatedness, practice-liking, sport investment, competence, autonomy choice, and autonomy IPLOC) representing three of the hallmarks of a QMSE. Together these findings suggest that congruence on three of the five specific adult-oriented coaching practices is just as important, or more important for fostering hallmarks of a QMSE than assessing congruence related to the general use of adult-oriented coaching practices.

As identified in the discussion in Chapter 3, a common theme amongst the three specific adult-oriented coaching practices (where congruence was particularly important for hallmarks of a QMSE) is uniqueness or individuality of the adult athletes. Indeed, previous research has noted that MAs have expressed the amount of effort, caring, and loyalty that their coaches put into their craft when trying to individualize each athletes' learning (Callary et al., 2017; Ferrari et al., 2016). For this reason, we speculate that when coaches try to ensure their coaching practices are more congruent with the MAs' unique characteristics, MAs not only recognize this, but they benefit in terms of improvements in components of their sport experiences.

Additionally in the second study of this thesis, it was found that the relationships between adult-oriented coaching practices and QMSE outcomes did not depend on congruent coaching practices. This result was tested from both the coaches and MAs' perspectives and considered both the general and specific use of adult-oriented coaching practices. This result was not in line with our expectations based on previous research (i.e., Smoll and colleagues' (1978) Mediational Model of Leadership and Smoll et al.'s (1978) Mediational Model of Leadership). We posit that our null findings could have been due to several methodological limitations (as outlined in the Discussion in Chapter 3). For example, Chelladurai (2007) outlines a hierarchical regression analysis to test congruence which has shown mixed findings in the past (Andrew, 2009; Chelladurai & Riemer, 1998; Riemer & Toon, 2001). Additionally, perceptual congruence (like the measure used in this thesis) could be measured in other ways such as observing the coaches' actual behaviours (Smoll et al., 1978), the athletes' expectations of coaching behaviours (Chelladurai, 2007), or the athletes' preferences for coaching behaviours (Chelladurai, 1984; Horne & Carron, 1985; Riemer & Toon, 2001). Finally, specific to the context of Masters sport, the heterogeneity of MAs limits the importance of congruence especially considering that adult-oriented coaching practices revolve around individual characteristics, wants, and needs (Rathwell et al., 2020).

Overall, the results and limitations surrounding congruent adult-oriented coaching practices in this thesis project outline the importance of congruence and the difficulties when integrating a measure of congruence into research. For this reason, researchers in the future should continue to ask questions surrounding congruence and work to find the most effective and efficient ways to integrate congruence into future research projects.

**Adult-Oriented Coaching Practices Change Over Time**

In our first study, we were able to determine that adult-oriented coaching practices remained stable over time when considering both the MAs' and coaches' perspectives on adult-oriented coaching practices, respectively. This finding is important for two reasons. From a methodological perspective, this stability offers preliminary evidence of the test-retest reliability (i.e., stability from one measurement sample to the next sample; Drost, 2011) of the AOSCS. From a practical perspective, the stability of the AOSCS found in study one demonstrates that coaches do not increase their use of adult-oriented practices naturally over time. This is important, especially because changes in AOSCS practices were related to increases in hallmarks of a QMSE over time in study one. Taken together, our findings suggest that intervention-based coach education might be needed to enhance coaches' use of beneficial adult-oriented coaching practices and provide additional benefits in terms of the hallmarks of a QMSE.

A call for intervention-based research is relevant given the recent interest in coaching Masters sport from national and provincial governing bodies. Specifically, Bowls Canada, Ontario Speed Skating, US Rowing, and the Coaches Association of Ontario, have requested and received coach education seminars for the sole purpose of providing a platform to learn about adult-oriented coaching practices (Callary et al., in progress-a; Callary et al., in progress-b). As a result of these coach education seminars, there have been many anecdotal requests from coaches for intervention work stemming from their positive experiences in the seminars. Currently, follow-up interviews with coaches and administrators are taking place to explore the efficacy and applicability of adult-oriented coaching practices and how intervention work might benefit different adult sport stakeholders (Callary et al., in progress-b). Additionally, preparations are ongoing to create a coach education workshop revolving around adult-oriented coaching practices (Belalcazar et al., in progress).

Our findings from our first study offer two valuable insights for future researchers who are considering conducting an intervention using adult-oriented coaching practices. First, in our drop-out analysis, we saw a 22.9% attrition rate for coaches, while there was a substantial 61% attrition rate for MAs. Although the COVID-19 pandemic may have had an impact on the study, our findings showed that MAs who spent less time participating in sport, less time coached, and felt their autonomy and competence were being thwarted, were more likely to drop out of the study. We speculate that MAs who dropped out were not as "serious-minded" and may have had previous experiences with ineffective coaches. Researchers should consider these findings when planning intervention studies in the future. For example, two screening questions could be used before intervention asking MAs about the degree to which they feel they are serious about sport and if they have had poor experiences with coaches in the past. If prospective participants respond in a way that indicates they are not serious-minded or that they have had problems with coaches in the past, their responses could be used to flag these adult athletes who will require additional support. In essence, these types of questions could potentially enable future researchers to better identify participants who need additional measures to ensure they are retained during longer-term intervention studies in the context of coached competitive sport.

Second, a methodological feature of our studies might be useful for researchers seeking to conduct an intervention with adult-oriented coaching practices. More specifically, we showed that it is feasible to measure the coaches' and MAs' perceptions of how frequently participants felt the coach used adult-oriented coaching practices. In our studies, we were able to recruit and pair the data between coaches and their MAs using a simple unique code. This method allowed us to gain insight into the perceptual congruence of adult-oriented coaching practices. Of course, as discussed in the previous section (i.e., congruence and adult-oriented coaching practices), the

stem used in the AOSCS only accounted for the coaches' and MAs' perceptions of how often adult-oriented coaching practices are used. In effect, to capture a broad understanding of the efficacy of adult-oriented coaching practices, researchers who are interested in intervention may also wish to consider measuring the coaches' *actual* coaching behaviours used, the MAs' *preferences* of said coaching behaviours, and the *importance* and *expectance* MAs may place on certain coaching behaviours. As such, these measures would provide a novel insight into paired samples of MAs and their coaches over time.

## Implications of Findings

The findings in this thesis apply to three cohorts: coaches of MAs, MAs themselves, and policymakers. This section will discuss the practical implications for each group.

### *Implications for Coaches of MAs*

The results of this thesis are highly applicable for coaches of MAs but also coaches of adult sportspersons in general. The findings from this thesis show that adult-oriented coaching practices are most effective when used as a whole, resulting in increases in several of the aspects of a QMSE. Moreover, the use of specific adult-oriented coaching practices can be used to target specific outcomes for MAs. For example, if a coach is noticing that an adult athlete is not cooperating, the coach should take more consideration of the athlete's experiences and motives when planning, organizing, and delivering practice. This is one of many examples from our findings that could be practically useful for coaches of MAs. Given our findings, if coaches use general or specific adult-oriented coaching practices, they can expect to have higher-quality relationships with their adult athletes while simultaneously fostering investment, commitment, relatedness, and enjoyment.

An additional way in which our findings are applicable for coaches is from the novel insights we provide regarding coaching adult sportspersons. Currently, few resources exist for coaches of MAs (Callary et al., 2018, 2020). For this reason, coaches could learn and share our findings within and across competitive adult sports. For instance, coaches could take time to share the findings with their coaching peers who are struggling to find resources on coaching adult athletes. Additionally, coaches could share our findings with their adult athletes to gauge the athletes' interests in the coach using adult-oriented coaching practices. Further, coaches could share our findings with individuals who are engaged in policymaking or governing competitive adult sports to suggest beneficial resources for both coaches and athletes alike. Overall, the findings from this thesis provide coaches with the first known set of evidence showing adult-specific coaching practices are related to enhanced sports experiences.

***Implications for MAs***

Our findings are also highly applicable for MAs since coaches' use of adult-oriented coaching practices resulted in a myriad of benefits for the MAs' sport experiences. As described by the findings in our studies, specific adult-oriented coaching practices can help improve specific aspects of a QMSE; however, adult athletes reported the most benefits when coaches used all adult-oriented coaching practices. Hypothetically, if a group of adult athletes are not enjoying their time in their coached sport, they could ask their coach to use adult-oriented coaching or they could find a new coach who uses adult-oriented coaching practices to ensure they are receiving quality adult programming. Additionally, if for example, an adult athlete feels unsatisfied in terms of their sports skills (i.e., competencies), they can point out to their coach that they need to understand and adapt to their preferences for effort, accountability, and feedback. The athlete could then explain that this practice would help make them feel more

competent if they received programming and instruction based on their needs and abilities. A final example could be if an adult athlete feels like they are intending to maintain the relationship with their coach. Before cutting ties with a coach, an athlete could ask their coach to share more of their personal experiences and knowledge. In this fashion, the coach and athlete could feel closer, building trust and respect. Overall, our findings are extremely applicable for MAs as adult-oriented coaching practices can foster higher quality experiences and sustained commitment across their lifespan.

### *Implications for Policymakers*

Finally, the results of this thesis should be recognized by policymakers involved in competitive and non-competitive adult sport. It has been well documented that there is a lack of coach education resources for coaching adult athletes (Young et al., 2014; Callary et al., 2018; Callary et al., 2020). For example, it was not long ago, that the existing resources for coaching MAs in Canada (provided by the national coaching certification organization) stated that there are "probably not" any differences when coaching MAs than when coaching younger athletes (Coaching Association of Canada, n.d., pp. 9). This notion, however, is beginning to change with the recent findings in qualitative literature (Rathwell et al., 2015; Callary et al., 2015; Callary et al., 2017; MacLellan et al., 2017, 2019; Currie, 2019), the development of the AOSCS (Rathwell et al., 2020), and now the results from our studies in this thesis. We encourage policymakers, at minimum, to update current coaching resources for coaching adult athletes based on more recent studies supporting the use of adult-oriented coaching practices.

## Additional Limitations and Future Directions

Although findings from our studies provided novel insights into the realm of coaching adult athletes with the use of adult-oriented coaching practices, there were some notable

limitations. One limitation that affected both studies was the item stems and Likert responses that were used in both the coach and athlete versions of the AOSCS. As discussed earlier, each item in the AOSCS was prefaced with "how often" when asking about adult-oriented coaching practices. Thus, the frequency of adult-oriented coaching practices was measured for both MAs and their coaches. However, because we asked "how often" specific practices were used from two perspectives, we are only gaining insight into each party's perceptions of the frequency of use of adult-oriented coaching practices. Although the frequency of coaching practices may provide insight on MAs' outcomes (i.e., practices used more often may result in higher levels of positive outcomes for MAs), it did not provide us with the entire picture of the coaching practices. Future studies could address this limitation by borrowing notions from Smoll and Smith's (1989) Mediational Model of Leadership and Chelladurai's (2007) Multidimensional Model of Leadership. These models offer insight into the interconnectivity of athletes' preferred behaviours, coaches' actual behaviours, and athletes' reactions to coaches' behaviours. Additional ways of measuring adult-oriented coaching practices could include coaches' actual behaviours, MAs' preferred behaviours, and the importance MAs place on each of the coaching behaviours. In this fashion, a comprehensive examination of the frequency, preferences, importance, and actual behaviours could provide a macroscopic understanding of congruence in terms of coaching practices.

An additional limitation was the types of data analyses used in both studies. The originally planned analyses (i.e., full factorial structural equation modelling) were adapted for both studies because of the small sample sizes, likely due to the premature cut-off from data collection due to the COVID-19 pandemic (discussed below), and many variables measured. As such, path analyses were used to test our relationships, which are more limited than full factorial

models because they assume all measurements are made without error (Cole & Preacher, 2014; Streiner, 2006). When path models are used, there needs to be an alternative check of reliability within the models. Therefore, we measured the internal reliability of all the variables to ensure they met standards ($\alpha > .70$; Pedhazur, 1982; Kelloway, 2014). Although this is not the preferred method, it is deemed acceptable if the reliability scores meet their threshold. Future research should attempt to confirm the results of this thesis with larger samples of participants and with full factorial models when analyzing the data.

Another limitation pertinent to both studies was the COVID-19 pandemic. At the time of data collection, the COVID-19 pandemic was disrupting and cancelling sport worldwide. As explained in Chapter 1, we attempted to mitigate the impact of the pandemic on our data collection and data analyses. Assuming that worldwide pandemics are not on regular occasions, researchers should not expect to have their data collection interrupted in the same manner as we did in our studies.

**Conclusion**

Overall, we explored the relationships between adult-oriented coaching practices and the hallmarks of a QMSE. Generally, coaches' use of adult-oriented coaching practices positively influenced the MAs' sport experience via quality relationships, feeling empowered, mastery, fun, and feeling validated, providing the first evidence of criterion validity for the AOSCS. Moreover, our findings provided initial evidence for the effectiveness of adult-oriented coaching practices in Masters sport. The two studies in this thesis also provided methodological and theoretical contributions related to the impact of congruence in the Masters context. Specifically, congruence of coaching practices was positively related to hallmarks of a QMSE, but the relationships between adult-oriented coaching practices and hallmarks of a QMSE did not

depend on the level of congruence between coaches and MAs. Finally, the findings from our first study suggest that future intervention research involving an adult-oriented coaching workshop may be appropriate.

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## Appendix 1: Example of First Contact Email to Coaches/Managers

Dear (coach/organization name),

The Masters sport research team (Canadian researchers) is inviting Masters coaches and their athletes to participate in a new study that is interested in Masters coaches' practices and Masters athlete experiences over time.

If you are a Masters coach, please contact the researcher below for more information on how you and you Masters athletes can participate.

Masters coaches and Masters athletes will be asked to complete an online survey at **two time points** (i.e., approximately 8 weeks apart). By completing the second survey, we will gain an understanding of how your experiences in your primary Masters sport have changed over time. The second survey will be sent directly to the email address that you provide to us on the first survey.

If you are interested in participating in this study, **please contact the researcher below to obtain a unique code for your Masters coach and athlete group**.

Thank you for your time,

Derrik Motz, M.Sc. Student
Department of Kinesiology and Physical Education
University of Lethbridge
4401 University Drive
Lethbridge, Alberta
Email:
**d.motz@uleth.ca**

www.coachingmastersathletes.com

This study is being conducted in accordance with research ethics procedures at the University of Lethbridge, Cape Breton University, and the University of Ottawa.

## Appendix 2: Study Information Sheet for Coaches and MAs

**Description of Study**

Masters athletes are typically 35 years of age or older (varies according to sport), formally registered in aclub or event(s), and train to compete in their sport – anywhere from recreational competitions to the World Masters Games. Master Athletes are unique from a coaching perspective because groups of athletes are heterogeneous in age, ability, experience, and competitive orientations. Currently, there are few resources available for Masters coaches that inform how to meet the needs of their adult athletes. Assuch, our research team from Cape Breton University, the University of Ottawa, and the University of Lethbridge, has launched a large-scale research initiative to better understand how coaches or instructorscan impact the sport experience of Masters athletes. We are currently conducting a study that requires data from both Masters athletes and coaches of Masters athletes. If you are interested in our study, we would greatly appreciate your participation.

### Longitudinal Study: Participation required from *both* athletes and their coach

*Masters Coach*

- As a **coach/instructor** of a Masters athlete, you will be asked to complete an online questionnaire(15-30 minutes) where you will report how frequently you employ certain coaching actions with your adult athletes.

- As a result of the study design, you will be required to provide your email address so that we cancompare your results to those taken at a later point in time (i.e., roughly 8 weeks later).

- When you complete the first survey your team will be assigned a unique numerical code, whichwe will share with you. At this time, we would ask you to provide your code to the athletes on your team and have them use it when completing the athlete portion of the survey.

- For the longitudinal study, coaches must complete the questionnaire so we may compare their responses with the athlete responses.

### Instructions for coach:

1) Contact the researchers below and obtain a unique numerical code for the questionnaire.

2) Provide your athletes with the ***unique numerical code***.

3) Click this link to complete the 1st survey: **Coaches' Survey Link**

4) The second survey will be emailed to you, in approximately 8 weeks, at the email address that youprovided in the 1st survey.

*Masters Athletes*

- As a **Masters athlete**, you will be asked about your experiences in your primary Masters sport and about the psychosocial outcomes attributed to your sport participation. Additionally, you willbe asked questions about the coaching you receive from your coach/instructor in this sport.

- At a later point in time (i.e., in roughly 8 weeks) you will be asked to complete as shorter surveywhere you will once again be asked about your experiences in your primary Masters sport and about the psychosocial outcomes attributed to your sport participation.

## Instructions for athletes:

1) Obtain the ***unique numerical code*** from your coach/instructor.

2) Click this link to complete the 1st survey: **MAs' Survey Link**

3) The second survey will be emailed to you, in approximately 8 weeks, at the email address that youprovided in the 1st survey.

## Ethical Procedures

Both studies are being conducted in accordance with research ethics procedures at Cape Breton University, the University of Lethbridge, and the University of Ottawa. Your involvement is entirely voluntary and there will be no negative consequences if you choose not to do so. If, after completion of the study, you wish to withdraw, you may do so by contactingthe researchers and your information will be subsequently destroyed. If you agree to participate, all theinformation that you provide will remain completely confidential. At no point will data be published or shared that includes any personally identifiable information.

## Conservation of Data

All data will be stored using the certified-secure online survey provider "Qualtrics" and protectedby a password required to log into the account. Any downloaded original data will be stored on a password protected computer in the lead researcher's locked office for 10 years, after which all data willbe deleted.

## Contact Information

If you have any questions about the survey or the nature of the studies, please feel free to contact:

Derrik Motz, M.Sc. Student
Department of Kinesiology and Physical Education
University of Lethbridge
4401 University Drive
Lethbridge, Alberta
Email:
**d.motz@uleth.ca**

## Appendix 3: Sheet Provided to MAs by their Coaches

On behalf of the Masters sport coaching research team (Canadian researchers at Cape Breton University, University of Ottawa, and University of Lethbridge), we invite you to participate in our most recent study on Masters coaching. Our group has been studying Masters sport, and in particular Masters coaching, for several years. We encourage you to check out our website www.coachingmastersathletes.com where you will find our published articles and brief research bytes that can bring you up to speed on what we have learned about Masters sport.

We are recruiting **Masters swimmers who are coached by [insert coach name]** to participate in an online survey that can be accessed at the following link

**[Time One Survey Link for MAs]**

Please use the **code #XXX** when you are prompted to do so. Thank you for your participation!

Derrik Motz, M.Sc. Student
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University of Lethbridge
4401 University Drive
Lethbridge, Alberta
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## Appendix 4: Example of Coach Survey (Time One)



# SURVEY FOR MASTERS (ADULT) SPORT COACHES


Survey for Masters (Adult) Sport Coaches

**Default Question Block**

***Study Description***

This study is part of a larger scale research initiative at Cape Breton University (Canada), the University of Ottawa (Canada), and the University of Lethbridge (Canada) that seeks to better understand the nuances of coaching/instructing in Masters sport. In Masters sport, adult athletes (generally 35 years or older) formally register to participate in sport, and their competitions are typically advertised or organized distinctly from competitions arranged for youth, adolescents, or young adults in the high performance stream. Masters sport involves competition, but participants may range from being recreationally competitive to competing at World Games.

***Study Requirements***

**As a coach/instructor, you will be asked to complete a survey where you will self-report how frequently you employ certain coaching actions with your adult athletes.** This survey should take you approximately 10-15 minutes to complete. Masters athletes that you coach/instruct will also be asked to participate in this study so that we may compare and contrast their responses. **As a result, you will be required to provide your email address and enter a numerical code (assigned by the researchers) when you complete this survey. You will also be required to share this numerical code with your Masters athletes (i.e., the adult athletes who would**

**recognize you as their primary coach/instructor) so that they may enter it when they complete their respective survey.**

**Further, you will be asked to complete another survey at a later point in time (i.e., 8 weeks roughly).** By completing this second survey, we will gain an understanding of how your coaching actions employed with your adult athletes may have changed over time.

***Ethical Procedures***

This study is being conducted in accordance with research ethics procedures at Cape Breton University. Your involvement in the research is entirely voluntary, and there will be no negative consequences if you choose not to do so. If, after completion of the study, you wish to withdraw, you may do so by contacting the researchers listed at the bottom of the page and your information will be subsequently destroyed. If you agree to participate, all of the information that you provide will remain completely confidential.

***Conservation of Data***

All data will be stored using the certified-secure online survey provider "Qualtrics" and protected by a password required to log into the account. Any downloaded original data will be stored on a password protected computer in the lead researcher's locked office for 10 years, after which all data will be deleted.

***Contact Information***

If you have any questions about the survey or the nature of the study, please feel free to contact any of the investigators below:

Bettina Callary, Ph.D.
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***Informed Consent***

To complete this survey, click the next arrow below. If you choose to complete the survey, we ask that you complete it alone.

***By clicking the 'Next' button below, you indicate that you freely consent to participate in this study.*** This means that you have been informed of the requirements of the research, understand that you have the opportunity to ask questions and discuss this study, and have been assured that your information will remain confidential.

**Block 1**

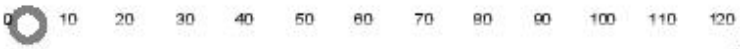
Thank you for participating in our research!

As a reminder, consider that we are seeking to better understand the nuances of coaching/instructing Masters sport. In Masters sport, adult athletes (generally 35 years or older) formally register to participate in sport, and their competitions are typically advertised or organized distinctly from competitions arranged for youth, adolescents, or young adults in the high performance stream. Masters sport involves competition, but participants may range from being recreationally competitive to competing at World Games.

Please start by answering a few basic questions.

If you were assigned a **UNIQUE NUMERICAL CODE** by our research team, please enter it here. If you were not assigned a numerical code, please leave this blank and proceed to the next question.

What is your age? (in years)




Age (in years)

What is your gender?

- Male
- Female
- Other

How would you describe yourself? (Check off all that apply)

- Caucasian or White
- African American or Black
- Asian
- Hispanic
- Aboriginal or Indigenous

☐ Other (please specify)

What is your highest level of education?

- ○ Elementary school
- ○ High school
- ○ College diploma
- ○ Undergraduate degree
- ○ Graduate degree (e.g., Masters, PhD, MD)

What is your country of residence?

If you have completed any Coaching Certification Programs, please describe these credentials here:

Which adult sport do you consider to be the one you coach/instruct **primarily**?

To what extent do you identify as **a coach** in this sport?

| Not at all | | | Somewhat | | | Very much so |
|---|---|---|---|---|---|---|
| O | O | O | O | O | O | O |

To what extent do you identify as **an instructor** in this sport?

| Not at all | | | Somewhat | | | Very much so |
|---|---|---|---|---|---|---|
| O | O | O | O | O | O | O |

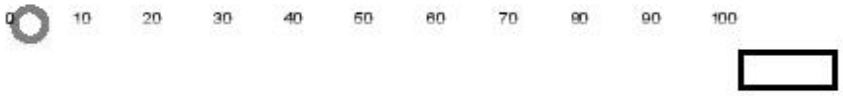
Are you paid for your coaching/instructing services in this sport? Please select the answer that best describes your situation.

- O Yes, I am paid for my coaching/instructing (primary job - I don't work elsewhere for pay)
- O Yes, I am paid for my coaching/instructing (but I also have another paying job)
- O No, I volunteer (but I have a paying job elsewhere)
- O No, I volunteer (and I don't work elsewhere for pay)
- O Other (please specify) [ ]

Across your life, how long have you been coaching this sport (*at any level of competition*)? Please accurately estimate the number of years.

0 10 20 30 40 50 60 70 80 90 100

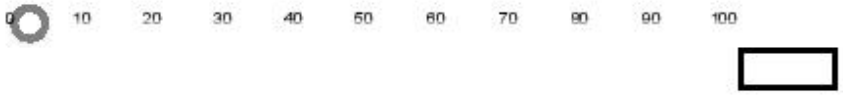

How many years in total have you been coaching this sport to **Masters athletes**?




Think about the amount of time you spend coaching/instructing adults in this sport.

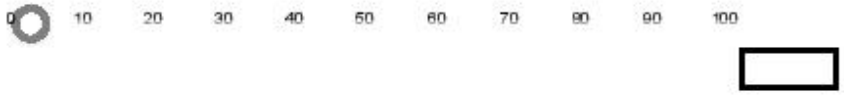
How many **months per year** do you coach adults?


How many **times per week** do you coach adults?




How many **hours per week** do you coach adults?

**How many competitive adult events** did you attend as a coach during the past 12 months?




**For the following questions, please consider the adult/Masters athletes you coach/instruct most often.**

What **level(s) of competition** do your adult athletes currently compete in? (Please check off all that relate to your athletes).

- [ ] Recreational
- [ ] Regional/local
- [ ] Provincial/state
- [ ] National
- [ ] International

How many of your athletes are:

| | None | A few | Many |
|---|---|---|---|
| 55 years and older | O | O | O |
| 41-54 years old | O | O | O |
| 31-40 years old | O | O | O |
| 20-30 years old | O | O | O |
| Under 20 years old | O | O | O |

Please answer the following question as you feel it relates to your adult athletes' training habits:

| | Not at all true | | | Somewhat true | | | Very true |
|---|---|---|---|---|---|---|---|
| My athletes need to train/practice regularly to get ready for their sport competitions | O | O | O | O | O | O | O |

**Block 2**

Based on your current or recent coaching/instructing in your primary Masters sport, please answer the following items.

**How often do you:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Explain to your adult athletes why they are learning something | O | O | O | O | O | O | O |
| Create situations wherein your adult athletes discover for themselves why they are learning a skill/tactic | O | O | O | O | O | O | O |
| Use performance assessments to help your adult athletes understand why they need to learn a skill/tactic | O | O | O | O | O | O | O |
| Create situations in which your adult athletes take responsibility in training | O | O | O | O | O | O | O |
| Allow your adult athletes to make their own decisions and choices with regards to their training | O | O | O | O | O | O | O |
| Set up the training environment so that your adult athletes have choices | O | O | O | O | O | O | O |
| Individualize your coaching for each adult athlete based on what s/he has been able to do in past experiences | O | O | O | O | O | O | O |
| Help your adult athletes examine their habits and biases when they encounter something new | O | O | O | O | O | O | O |
| Listen to your adult athletes' comments about their past experiences to inform how you set up their training | O | O | O | O | O | O | O |
| Ask your adult athletes about their past experiences to help you plan their training | O | O | O | O | O | O | O |

Based on your current or recent coaching/instructing in your primary Masters sport, please answer the following items.

**How often do you:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Challenge your adult athletes to try something new | O | O | O | O | O | O | O |
| Expose your adult athletes to something new to prepare them for learning | O | O | O | O | O | O | O |
| Design training to be sensitive to demands on your adult athletes' lives outside of sport | O | O | O | O | O | O | O |
| Consider what your adult athletes want to accomplish when organizing their training | O | O | O | O | O | O | O |
| Ready your adult athletes to learn by exposing them to higher skilled peers, competitors, or role models | O | O | O | O | O | O | O |
| Ask your adult athletes what their goals are and how they hope to achieve them | O | O | O | O | O | O | O |
| Ask your adult athletes to do drills in which they need to resolve a challenge | O | O | O | O | O | O | O |
| Ask your adult athletes to relate drills/exercises to problems they are facing in sport | O | O | O | O | O | O | O |

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Ask your adult athletes to relate their training to concerns they are facing outside of sport | O | O | O | O | O | O | O |
| Purposefully incorporate variety into your adult athletes' training | O | O | O | O | O | O | O |

Based on your current or recent coaching/instructing in your primary Masters sport, please answer the following items.

**How often do you:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Set up opportunities for your adult athletes to experience success in practice | O | O | O | O | O | O | O |
| Set up opportunities for competitive activities for your adult athletes during practice | O | O | O | O | O | O | O |
| Consider your adult athletes' personal motives when planning your practices | O | O | O | O | O | O | O |
| Demonstrate to your adult athletes that you have knowledge tailored to coaching adults that is different from coaching youth | O | O | O | O | O | O | O |
| Identify to your adult athletes how your own sport experience bears on the information that you share with them | O | O | O | O | O | O | O |

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Share information from your own professional coaching development with your adult athletes | O | O | O | O | O | O | O |
| Bring in information to your adult athletes that you have picked up in your sport experiences elsewhere (i.e., outside of your current program or club) | O | O | O | O | O | O | O |
| Purposefully display your serious commitment to your adult athletes' program | O | O | O | O | O | O | O |
| Make efforts to relate to your adult athletes in a social context | O | O | O | O | O | O | O |
| Encourage friendships among your adult athletes | O | O | O | O | O | O | O |

Based on your current or recent coaching/instructing in your primary Masters sport, please answer the following items.

**How often do you:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Treat your athletes as adults | O | O | O | O | O | O | O |
| Monitor your adult athletes' effort and work ethic | O | O | O | O | O | O | O |
| Set up practices so that you are making the most efficient use of practice time | O | O | O | O | O | O | O |

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Consider how each of your adult athletes wishes to be pushed during practice | O | O | O | O | O | O | O |
| Consider your adult athletes' preferences for being held responsible for working hard | O | O | O | O | O | O | O |
| Make unpopular coaching decisions if it helps your adult athletes get the most out of training | O | O | O | O | O | O | O |
| Use a variety of instructional styles when delivering a practice to your adult athletes | O | O | O | O | O | O | O |
| Use positive and constructive feedback to encourage your adult athletes | O | O | O | O | O | O | O |
| Pay close attention to the instructional needs of each adult athlete | O | O | O | O | O | O | O |
| Take measures to better understand what each adult athlete wants in terms of coaching feedback | O | O | O | O | O | O | O |

Based on your current or recent coaching/instructing in your primary Masters sport, please answer the following items.

**How often do you:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Avoid negative feedback and criticism of individual adult athletes in front of others | O | O | O | O | O | O | O |
| Explain the purpose of drills to your adult athletes | O | O | O | O | O | O | O |
| Ensure that coaching resources (e.g., equipment, electronic media) and coaching personnel (e.g., assistant coach) are shared with all of your adult athletes | O | O | O | O | O | O | O |
| Pay attention to where your adult athletes are in terms of their progress relative to season-long plans | O | O | O | O | O | O | O |
| Consider how to accommodate your adult athletes when you set up practice/competitive schedules | O | O | O | O | O | O | O |
| Point out to your adult athletes aspects of long-term programming (e.g., practice/competitive schedules) that you have tailored to them) | O | O | O | O | O | O | O |
| Consider how to accommodate your adult athletes in terms of programming, such as practice or competitive schedules | O | O | O | O | O | O | O |
| Compete at the same venue as your adult athletes | O | O | O | O | O | O | O |
| Share information with your adult athletes about how they can improve their preparation for performances | O | O | O | O | O | O | O |
| Have debrief meetings with your adult athletes after a competition | O | O | O | O | O | O | O |

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Tailor your support to individual adult athletes at competitions | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**Block 3**

This final section of questions will focus on your prior athletic experience in the primary Masters/adult sport that you coach/instruct:

How many years of experience as an athlete do you have in this sport?

0 10 20 30 40 50 60 70 80 90 100

Do you still compete as an athlete in this sport?

- ○ Yes
- ○ No

Do you participate as an athlete during organized Masters training/practice sessions at the same time as the athletes that you coach/instruct?

- ○ No

- Rarely
- Sometimes
- Often
- Not applicable

Do you compete against your adult athletes?

- No
- Rarely
- Sometimes
- Often
- Not applicable

**Block 4**

You have now answered all of our questions. Thank you.

**Please enter your email address** (this information will only be shared with our research team). **We require this information so that we can identify you and send you the link to the second shorter survey in roughly 2 months.** When you receive the invitation to complete the second survey, you may voluntarily participate at that time or you may disregard the invitation without any consequences. Importantly, *your email address will be immediately deleted from our files upon completion of this study.*

Please input your email address here:

Powered by Qualtrics

## Appendix 5: Example of Masters Athlete Survey (Time One)



# SURVEY FOR MASTERS (ADULT) ATHLETES

Cape Breton University | uOttawa | University of Lethbridge

Survey for Masters (Adult) Athletes

**Default Question Block**

***Study Description***

This study is part of a larger scale research initiative at Cape Breton University (Canada), the University of Ottawa (Canada), and the University of Lethbridge (Canada) that seeks to better understand the nuances of Masters sport. In Masters sport, adult athletes (generally 35 years or older) formally register to participate in sport, and their competitions are typically advertised or organized distinctly from competitions arranged for youth, adolescents, or young adults in the high performance stream. Masters sport involves competition, but participants may range from being recreationally competitive to competing at World Games.

In this study, we are interested in understanding your experiences in your primary Masters sport. If you have a coach/instructor that regularly supports you in your primary sport, you will be asked additional questions about the coaching/instruction you receive from this person. Your responses will remain completely confidential, and they will never be shared with your coach.

***Study Requirements***

In this study, we are interested in understanding your experiences in your primary Masters sport. **In particular, you will be asked questions about the coaching you**

**receive from your coach/instructor in this sport (i.e., the coach/instructor who provided you with a numerical code). That is, prior to completing this survey, your coach/instructor will have provided you with a numerical code that you will enter in a designated spot at the end of this survey.** This study consists of an online questionnaire that takes approximately 15-30 minutes to complete.

Your coach will also be asked to participate in this study so that we may compare and contrast his/her responses with your responses (and the responses of other athletes coached by your coach). As a result of this study design, you will be required to provide your email address and the numerical code you received from your coach when you complete this survey. **However, your individual responses will remain completely confidential, and they will never be shared with your coach or with other athletes. If 5 or more Masters athletes from your club/organization respond to this survey and are also coached by your specific coach, then your coach may receive the aggregated results representing the responses from all their Masters athletes.**

**Further, you will be asked to complete a shorter survey again at a later point in time (i.e., in roughly 8 weeks).** By completing this second survey, we will gain an understanding of how your experiences in your primary Masters sport may have changed over time.

***Conservation of Data***

All data will be stored using the certified-secure online survey provider "Qualtrics" and only the investigators will have access to your information. Any downloaded original data will be stored on a password protected computer in the lead researcher's locked office. Data will be conserved for 10 years, after which it will be deleted.

***Contact Information***

If you have any questions about the survey or the nature of the study, please feel free to contact any of the investigators below:

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School of Arts and Social Sciences
Cape Breton University

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Erna MacLeod
Research Ethics Board Co-Chair
Cape Breton University

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Sydney, NS
Canada B1P 6L2
Email: ema_macleod@cbu.ca

***Informed Consent***

To complete the survey, click 'Next' below. If you choose to complete the survey, we ask that you complete it alone.

***By clicking the 'Next' button below, you indicate that you freely consent to participate in this study.*** This means that you have been informed of the requirements of the research, understand that you have the opportunity to ask questions and discuss this study, and have been assured that your information will remain confidential. Please print a copy of the consent form to keep for your personal records.

**Block 1**

**Thank you for participating in our research!**

As a reminder, consider that we are seeking to better understand the nuances of Masters sport. In Masters sport, adult athletes (generally 35 years or older) formally register to participate in sport, and their competitions are typically advertised or organized distinctly from competitions arranged for youth, adolescents, or young adults in the high performance stream. Masters sport involves competition, but participants may range from being recreationally competitive to competing at World Games.

**Please start by answering a few basic questions.**

If you received a **UNIQUE NUMERICAL CODE** from your **COACH**, please enter it here. Please do not continue without entering the unique code you have obtained from your coach.

What is your age? (in years)

0 10 20 30 40 50 60 70 80 90 100 110 120

Age (in years)

What is your gender?

- Male
- Female
- Other (please specify)

How would you describe yourself? (Check off all that apply)

- Caucasian or White
- African American or Black
- Asian
- Hispanic

- [ ] Aboriginal or Indigenous
- [ ] Other (please specify)

What is your highest level of education?

- Elementary school
- High school
- College diploma
- Undergraduate degree
- Graduate degree (e.g., Masters, PhD, MD)

What is your country of residence?

What is your **primary sport** at present?

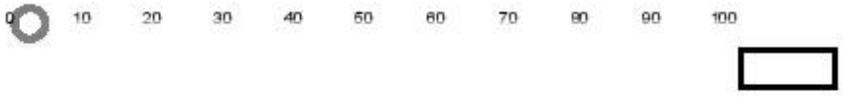
With respect to your primary sport:

How many **months per year** do you participate?


How many **times per week** do you practice/train for your sport?


Of the number you just indicated, **how often (times per week) is a coach/instructor on-site and involved with your training?**


**How many competitive events** did you participate in during the past 12 months?



What is your **level of competition** for your **primary sport** as an adult athlete? (Please check off all that relate to you)

- ☐ Recreational
- ☐ Regional/local
- ☐ Provincial/state
- ☐ National
- ☐ International

At what **age** (in years) did you **begin participation** in your **primary sport** as an **adult athlete?**

0 10 20 30 40 50 60 70 80 90 100 110 120

Please answer the following two item as it relates to your personal training habits:

| | Not at all true | | | Somewhat true | | | Very true |
|---|---|---|---|---|---|---|---|
| I need to regularly train/practice to get myself ready for my sport competitions. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Do you have a coach/instructor that regularly supports you in your primary sport?

- ○ Yes
- ○ No
- ○ Sometimes

For how many years have you been involved with this coach/instructor?


How important are your interactions with this coach/instructor during practice/training?

| Very unimpotant | | | Somewhat important | | | Very important |
|---|---|---|---|---|---|---|
| O | O | O | O | O | O | O |

**Block 2**

Think about your current or recent involvement in your **primary Masters sport**. We would like you to **consider the coach/instructor who primarily supports you** while answering the following items.

**My coach/instructor:**

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Explains to me why I am learning something | O | OO | O | OO | O |
| Creates situations wherein I discover for myself why I am learning a skill/tactic | O | OO | O | OO | O |

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Uses performance assessments to help me understand why I need to learn a skill/tactic | O | O | O | O | O | O | O |
| Creates situations in which I take responsibility in training | O | O | O | O | O | O | O |
| Allows me to make my own decisions and choices with regards to my training | O | O | O | O | O | O | O |
| Sets up the training environment so that I have choices | O | O | O | O | O | O | O |
| Individualizes his/her coaching based on what I have been able to do in past experiences | O | O | O | O | O | O | O |
| Helps me examine my habits and biases when I encounter something new | O | O | O | O | O | O | O |
| Listens to my comments about my past experiences to inform how s/he sets up my training | O | O | O | O | O | O | O |
| Asks about my past experiences when planning my training | O | O | O | O | O | O | O |

Think about your current or recent involvement in your **primary Masters sport**. We would like you to **consider the coach/instructor who primarily supports you** while answering the following items.

**My coach/instructor:**

| | Never | | | Sometimes | | | Always |
|---|---|---|---|---|---|---|---|
| Challenges me to try something new | O | O | O | O | O | O | O |
| Exposes me to something new to prepare me for learning | O | O | O | O | O | O | O |
| Designs training to be sensitive to demands on my life outside of sport | O | O | O | O | O | O | O |
| Considers what I want to accomplish when organizing my training | O | O | O | O | O | O | O |

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Readies me to learn by exposing me to higher skilled peers, competitors, or role models | O | OO | O | OO | O |
| Asks me what my goals are and how I hope to achieve them | O | OO | O | OO | O |
| Asks me to do drills in which I need to resolve a challenge | O | OO | O | OO | O |
| Asks me to relate drills/exercises to problems I am facing in sport | O | OO | O | OO | O |
| Asks me to relate my training to concerns I am facing outside of sport | O | OO | O | OO | O |
| Purposefully incorporates variety into my training | O | OO | O | OO | O |

Think about your current or recent involvement in your **primary Masters sport**. We would like you to **consider the coach/instructor who primarily supports you** while answering the following items.

**My coach/instructor:**

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Sets up opportunities for me to experience success in practice | O | OO | O | OO | O |
| Sets up opportunities for competitive activities for me during practice | O | OO | O | OO | O |
| Considers my personal motives when planning my practices | O | OO | O | OO | O |
| Demonstrates to me that s/he has knowledge tailored to coaching adults that is different from coaching youth | O | OO | O | OO | O |
| Identifies how his/her own sport experience bears on the information that s/he shares with me | O | OO | O | OO | O |
| Shares information from his/her professional coaching development with me | O | OO | O | OO | O |

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Brings in information to me that s/he has picked up in his/her sport experiences elsewhere (i.e., outside of my current program or club) | O | OO | O | OO | O |
| Displays his/her serious commitment to my program | O | OO | O | OO | O |
| Makes efforts to relate to me in a social context | O | OO | O | OO | O |
| Encourages friendships among athletes in my program | O | OO | O | OO | O |

Think about your current or recent involvement in your **primary Masters sport**. We would like you to **consider the coach/instructor who primarily supports you** while answering the following items.

**My coach/instructor:**

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Treats me as an adult | O | OO | O | OO | O |
| Monitors my effort and work ethic | O | OO | O | OO | O |
| Sets up practices so that s/he is making the most efficient use of practice time | O | OO | O | OO | O |
| Considers how I wish to be pushed during practice | O | OO | O | OO | O |
| Considers my preferences for being held responsible for working hard | O | OO | O | OO | O |
| Is willing to make unpopular coaching decisions if it helps me get the most out of training | O | OO | O | OO | O |
| Uses a variety of instructional styles when delivering a practice | O | OO | O | OO | O |
| Uses positive and constructive feedback to encourage me | O | OO | O | OO | O |
| Pays close attention to my instructional needs | O | OO | O | OO | O |

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Takes measures to better understand what I want in terms of coaching feedback | O | OO | O | OO | O |

Think about your current or recent involvement in your **primary Masters sport**. We would like you to **consider the coach/instructor who primarily supports you** while answering the following items.

**My coach/instructor:**

| | Never | | Sometimes | | Always |
|---|---|---|---|---|---|
| Avoids using negative feedback and criticizing me in front of others | O | OO | O | OO | O |
| Explains the purpose of drills to me | O | OO | O | OO | O |
| Ensures that coaching resources (e.g., equipment, electronic media) and coaching personnel (e.g., assistant coach) are shared with me | O | OO | O | OO | O |
| Pays attention to where I am in terms of my progress relative to season-long plans | O | OO | O | OO | O |
| Considers how to accommodate me when s/he sets up practice/competitive schedules | O | OO | O | OO | O |
| Points out aspects of long-term programming (e.g., practice/competitive schedules) that s/he has tailored to me | O | OO | O | OO | O |
| Considers how to accommodate me in terms of programming, such as practice or competitive schedules | O | OO | O | OO | O |
| Competes at the same venue as me | O | OO | O | OO | O |
| Shares information with me about how I can improve preparation for performances | O | OO | O | OO | O |
| Has debrief meetings with me after a competition | O | OO | O | OO | O |
| Tailors his/her support to me at competitions | O | OO | O | OO | O |

Think about your current or recent involvement in **your primary Masters sport**. Please indicate **the degree to which you agree or disagree with each statement** related to **the coach/instructor who primarily supports you:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| I feel close to my coach | O | O | O | O | O | O | O |
| I feel committed to my coach | O | O | O | O | O | O | O |
| I feel that my sport career is promising with my coach | O | O | O | O | O | O | O |
| I like my coach | O | O | O | O | O | O | O |
| I trust my coach | O | O | O | O | O | O | O |
| I respect my coach | O | O | O | O | O | O | O |
| I feel appreciation for the sacrifices my coach has made to improve his/her performance | O | O | O | O | O | O | O |
| When I am coached by my coach, I feel at ease | O | O | O | O | O | O | O |
| When I am coached by my coach, I feel responsive to his/her efforts | O | O | O | O | O | O | O |
| When I am coached by my coach, I am ready to do my best | O | O | O | O | O | O | O |
| When I am coached by my coach, I adopt a friendly stance | O | O | O | O | O | O | O |

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| Because of my coach, I like to go to practice | O | O | O | O | O | O | O |
| Because of my coach, I want to invest more in my sport | O | O | O | O | O | O | O |

Please answer the following questions in relation to your current or recent involvement in your **primary Masters sport**. Choose the response that best describes **how you usually feel about your involvement in this sport.**

| | Not at all true for me | | | Somewhat true for me | | | Very true for me |
|---|---|---|---|---|---|---|---|
| I am committed to keep doing my sport | O | O | O | O | O | O | O |
| I find participating in my sport to be very enjoyable | O | O | O | O | O | O | O |

Please answer the following questions in relation to your current or recent involvement in your primary Masters sport. **Choose the response that best describes your usual feelings and experiences within this sport.**

| | Not at all true | | | | | | Very true |
|---|---|---|---|---|---|---|---|
| I show concern for others in my sport | O | O | O | O | O | O | O |
| I have the ability to perform well in my sport | O | O | O | O | O | O | O |
| In my sport, I feel that I am being forced to do things that I don't want to do | O | O | O | O | O | O | O |
| In my sport, I get opportunities to make decisions | O | O | O | O | O | O | O |
| I get opportunities to feel that I am good at my sport | O | O | O | O | O | O | O |
| In my sport, I really have a sense of wanting to be there | O | O | O | O | O | O | O |
| I feel I am good at my sport | O | O | O | O | O | O | O |
| In my sport, I have a say in how things are done | O | O | O | O | O | O | O |
| I feel I participate in my sport willingly | O | O | O | O | O | O | O |
| In my sport, I get opportunities to make choices | O | O | O | O | O | O | O |

Please answer the following questions in relation to your current or recent involvement in your primary Masters sport. **Choose the response that best describes your usual feelings and experiences within this sport.**

| | Not at all true | | | | | | Very true |
|---|---|---|---|---|---|---|---|
| I choose to participate in my sport according to my own free will | O | O | O | O | O | O | O |
| I have close relationships with people in my sport | O | O | O | O | O | O | O |
| I am skilled at my sport | O | O | O | O | O | O | O |
| In my sport, I feel I am doing what I want to be doing | O | O | O | O | O | O | O |
| In my sport, there are people who I can trust | O | O | O | O | O | O | O |
| I can overcome challenges in my sport | O | O | O | O | O | O | O |
| In my sport, I feel close to other people | O | O | O | O | O | O | O |
| In my sport, I can take part in the decision-making process | O | O | O | O | O | O | O |
| In my sport, I feel I am pursuing goals that are my own | O | O | O | O | O | O | O |
| There are people in my sport who care about me | O | O | O | O | O | O | O |

Please answer the following questions in relation to your current or recent involvement in your primary Masters sport. **Choose the response that best describes your usual feelings and experiences within this sport.**

| | Not at all true | | | | | | Very true |
|---|---|---|---|---|---|---|---|
| I feel prevented from making choices with regard to the way I train | O | O | O | O | O | O | O |
| I feel pushed to behave in certain ways | O | O | O | O | O | O | O |
| I feel forced to follow training decisions made for me | O | O | O | O | O | O | O |
| I feel under pressure to agree with the training regimen I am provided | O | O | O | O | O | O | O |
| Situations occur in which I am made to feel incapable | O | O | O | O | O | O | O |
| There are times when I am told things that make me feel incompetent | O | O | O | O | O | O | O |
| There are situations where I am made to feel inadequate | O | O | O | O | O | O | O |
| I feel inadequate because I am not given opportunities to fulfill my potential | O | O | O | O | O | O | O |
| I feel I am rejected by those around me | O | O | O | O | O | O | O |
| I feel others can be dismissive of me | O | O | O | O | O | O | O |
| I feel other people dislike me | O | O | O | O | O | O | O |
| I feel other people are envious when I achieve success | O | O | O | O | O | O | O |

*If you haven't done so already,* please indicate your **UNIQUE NUMERICAL CODE**:

**Please enter your email address** (this information will only be shared with our research team). We require this information so that we can identify you and send you the link to the second shorter survey in roughly 2 months. When you receive the invitation to complete the second survey, you may voluntarily participate at that time or you may disregard the invitation without any consequences. **Importantly, your email address will be immediately deleted from our files upon completion of this study.**

Please input your **email address** here:

**Thank you for your participation!**

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## Appendix 6: Second Contact Email for Coaches/MAs

Dear (name of coach/organization),

On behalf of the Masters sport coaching research team, I am contacting you to thank you for your recent participation in our research. You will remember that you completed our online survey roughly 2 months ago and provided your email address. We are now launching our second round of data collection for this study and are kindly requesting that you complete this second online survey at your earliest convenience. This second online survey is a shorter version of the first survey you completed 2 months ago and will provide valuable information about your perceptions within your sport environment at this time in your season. In the last survey, you were given a code that identified you as part of a specific team. Please input this code into the survey when prompted. Your code is _____.

Here is the link to the second online survey: (insert either coach or athlete survey link)

Thank you again for taking the time to be involved in our research. We genuinely value your opinion, and appreciate you working with us to better understand Masters sport coaching. If you have any questions or concerns, please don't hesitate to respond to this email or contact another member of the research team listed below.

If you have any questions about the survey or the nature of the studies, please feel free to contact:

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