UNDERSTANDING SPORT ADHERENCE IN MASTERS ATHLETES: A GROUNDED THEORY

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Abstract

Large portions of the global population fail to meet physical activity (PA) guidelines (Guthold et al., 2018). Masters athletes (MAs) are a population of older adults that exceed PA guidelines and adhere to sport (Young & Medic, 2011a). Straussian grounded theory (Corbin & Strauss, 2015) was used to understand MAs' adherence strategies. Fourteen MAs (M_{age} = 53.64 years, *SD* = 8.38) from individual-based sports participated in semi-structured interviews. Data were analyzed through memoing, constant comparison and a process of open coding, axial coding, and theoretical integration. MAs' sport adherence was influenced by personal adherence strategies (e.g., goal setting, creating routines), social factors (e.g., interactions with teammates, coaches, and family), and environmental and contextual factors (e.g., work, proximity to facilities). By understanding MAs' adherence, I hope to use this information to help facilitate regular sport participation and long-term adherence for adult athletes.

Preface

The entirety of this thesis is based on the research of Zakry Walsh, which was conducted in the Psychology for Active Living and Sport (PALS) laboratory at the University of Lethbridge. I, Zakry Walsh, was responsible for the literature review, recruitment, data collection, data analysis, interpretation of the results, and writing of this thesis. Additionally, Dr. Scott Rathwell of the University of Lethbridge, supervised this project and helped with the interpretation of the data following the various phases of data analysis, along with the editing of this thesis. Dr. Sean Brayton of the University of Lethbridge and Dr. Bettina Callary of Cape Breton University provided feedback on the study prior to the start of recruitment.

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List of Abbreviations

PA	Physical activity
WHO	World Health Organization
MA(s)	Masters athlete(s)
GT	Grounded theory
BCT	Behaviour change theory
TTM	Transtheoretical Model of Behavioural Change
TPB	Theory of Planned Behaviour
PBC	Perceived behavioural control
MSOC	Model of Selective Optimization with Compensation
SCM	Sport Commitment Model

Chapter 1: Introduction

For individuals to achieve the health benefits associated with physical activity (PA), they need to regularly achieve 150 minutes of moderate-to-vigorous PA per week (Piercy et al., 2018; Tremblay et al., 2011; World Health Organization [WHO], 2021). Despite this, large portions of the population remain physically inactive (Gerovasili et al., 2015; Guthold et al., 2018; Prince et al., 2020). One group who regularly exceed physical activity guidelines are Masters athletes (MAs). MAs are athletes who participate in sport later in adulthood and are typically 35 years of age or older, registered in formal clubs and/or competitions, and are competitively oriented in sport (i.e., train to prepare for their competitions; Young, 2011). MAs represent one of the fastest growing sporting cohorts in westernized countries which coincides with the aging of the global population (Dionigi et al., 2011), and they are unique in that they are able to maintain regular sport participation throughout adulthood, and in some instances across the lifespan.

It may be helpful to understand the strategies that help MAs adhere to sport, given their increased rates of PA and more specifically, their ability to maintain these levels long-term. I propose using Straussian grounded theory (GT) (Corbin & Strauss, 2015) to create a theory of sport adherence using data from MAs. Straussian GT is a qualitative research methodology where the researcher seeks to develop a theory grounded in the lived experiences of individuals for a desired behaviour or phenomenon (Corbin & Strauss, 2015).

GT is typically used in one of three settings: 1) when there is no pre-existing theory that explains a desired behaviour, 2) when the pre-existing theories create ineffective interventions, and 3) when the pre-existing theories were created using a different population (Cresswell & Poth, 2018). Straussian GT was selected because the pre-existing behaviour change theories that are widely used in the field of sport and exercise psychology are often ineffective at fostering

maintained PA participation long-term. Furthermore, there is no theory available that readily explains how and why Masters athletes are able to maintain their increased PA levels. Understanding how MAs adhere to sport and remain active later in adulthood may provide a roadmap for other adults athletes to help them sustain their levels of sport and PA involvement. The research question guiding this study was: What strategies do MAs use to adhere to Masters sport?

Chapter 2: Literature Review

Physical Activity

There are numerous physical and psychological health benefits associated with regular physical activity (PA) (e.g., Aylett et al., 2018; Borjesson et al., 2016; de Oliveira et al., 2018; Li & Siegrist, 2012; McTiernan et al., 2019; Schuch et al., 2018; Warburton et al., 2006), which has caused many countries and organizations to create guidelines so that individuals know how much PA is needed to gain these benefits (e.g., reduced levels of anxiety, lower risk of cardiovascular disease). Guidelines typically recommend that adults and older adults (18-64 and 65 years of age or older, respectively) participate in at least 150 minutes of moderate-to-vigorous aerobic PA per week in bouts of at least 10 minutes, and to incorporate bone and muscle strengthening activities (e.g., running or lifting weights, respectively) at least 2 days per week (Piercy et al., 2018; Tremblay et al., 2011; WHO, 2021). Additionally, it is recommended that older adults perform physical activities that helps enhance their balance to prevent falls (Piercy et al., 2018; Tremblay et al., 2011; WHO, 2021). Sport presents as an avenue for individuals to meet the PA guidelines, as several sports such as hockey, tennis, or triathlon provide individuals with time spent in moderate-to-vigorous aerobic PA, while also incorporating components that help with muscle and bone strengthening.

Despite these recommendations, large portions of the population remain physically inactive. Globally, a study by Guthold and colleagues (2018), which included data from 1.9 million participants from 168 countries, concluded that 27.5% of individuals did not meet PA recommendations. Gerovasili et al. (2015) obtained similar findings in a European setting, where 28.6% of the respondents from across Europe were physically inactive. When looking at a Canadian setting, Prince et al. (2020) found that Canadian adults averaged approximately 80

minutes of moderate-to-vigorous PA per week, which is just over half of what is recommended. To combat this wave of physical inactivity, researchers are looking for ways to help large portions of the public be more active. Sport and sport-related training represent an avenue that some individuals use to maintain regular PA.

Criticisms of Current Models and Theories

Behaviour change theories (BCTs) are commonly used in sport and exercise psychology to help researchers develop and test various interventions with the aim to increase sport and PA uptake and maintenance. However, these theories have several limitations and fail to create long-term participation. Two theories that are largely scrutinized in the field are the Transtheoretical Model of Behaviour Change (Prochaska & DiClemente, 1982) and the Theory of Planned Behaviour (Ajzen, 1991).

Limitations of the Transtheoretical Model of Behaviour Change

The Transtheoretical Model of Behaviour Change (TTM) is a commonly used BCT in sport and exercise psychology, which has had its effectiveness in the field questioned. TTM is a stage based BCT, in which individuals progress through stages that are based on their level of interest in engaging in a particular behaviour, such as regular PA. Currently, the theory has five stages: precontemplation, contemplation, preparation, action, and maintenance (Nigg et al., 2011; Prochaska & Velicer, 1997). Precontemplation refers to when the individual has no intention in engaging in PA. Contemplation is when the individual is considering engaging in PA in the next 6 months. Preparation alludes to when the individual intends to engage in PA in the next month (Prochaska & Velicer, 1997). Action is where the individual has started to engage in PA, and lastly, maintenance is when the individual has regularly engaged in PA anywhere from the past 6 months to 5 years (Nigg et al., 2011; Prochaska & Velicer, 1997). This theory presents with

behavioural and experiential strategies that one can use to progress from stage-to-stage. Furthermore, there are three constructs which influence an individual in what stage they are in and when they progress from one to another, those being: decisional balance, self-efficacy, and temptation, with the latter recently being validated for the PA context (Nigg et al., 2011).

One criticism of the model is the incorporation of stages. The use of stages does not allow for a fluid and continual process (Nigg et al., 2011). There is also concern regarding the time frames that are used for each stage, which leads to inconsistent classifications from study-to-study or potential misclassification, both of which may hinder the effectiveness of the desired intervention (Rhodes & Nigg, 2011). TTM is also typically used in cross-sectional studies, despite needing longer timeframes or interventions to allow for an accurate and appropriate analysis of stage change, which may be problematic as it seeks to help individuals maintain their participation over several years (Nigg et al., 2011). TTM can be effective when using interventions that target people in the same stage, however, there is mixed results for overall intervention efficacy when studies use a mismatched stage approach (Rhodes & Nigg, 2011; Rhodes & Pfaeffli, 2010).

Limitations of the Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) (Ajzen, 1991) is another BCT that has recently come under criticism over the past several years. TPB uses theoretical constructs based on individual motivational factors that interact to influence one's engagement in a behaviour (Ajzen, 1991). The three antecedent constructs are attitudes towards the behaviour, subjective norms, and perceived behavioural control (PBC) (Ajzen, 1991). Attitudes towards the behaviour refer to an individual's positive or negative evaluation of the behaviour, their performance in the behaviour, and the consequences of the behaviour (Ajzen, 1991). Subjective norms are an

individual's perceptions of what other people think about them engaging in the behaviour and their motive to comply. Lastly, PBC is an individual's perception of the difficulty of the behaviour. These 3 antecedents all influence an individual's intention, which involves an individual's intent to engage or not to engage in a behaviour (Ajzen, 1991). Finally, PBC may also directly influence the behaviour itself (Ajzen, 1991).

Overall, TPB does not identify the origins of the antecedents of behaviour and does not distinguish between individuals who want to participate in the behaviour and those who feel obligated to do so (Hagger & Chatzisarantis, 2008, 2009). Sniehotta et al. (2014) discussed the limited predictive validity that the theory has, citing that interventions created using TPB are often ineffective. Intention and PBC are most effective at predicting behaviour, however, subjective norms is a weak predictor with several researchers stating that it should be removed from the theory (Rhodes & Nigg, 2011; Sniehotta et al., 2014). Additionally, some researchers have begun adding variables to their tests which have exhibited greater associations with intention than the original constructs on several occasions (Gretebeck et al., 2007; Head & Noar, 2014; Sniehotta et al., 2014). While there are limitations that are specific to the aforementioned theories, there are also limitations that can be generalized to most BCTs.

General Limitations of Behaviour Change Theories

While the use of BCTs may be appealing in the context of sport and PA, a major limitation of these theories is that they were not designed for sport or exercise (Rhodes & Nigg, 2011). Instead, they were simply taken from different disciplines and adapted to fit the context of sport and PA (Rhodes & Nigg, 2011). For instance, TTM was initially intended for use with individuals who wanted to quit smoking (a cessation behaviour) and was adapted for use in PA research to get individuals to start and maintain regular PA (an adoption behaviour) (Nigg et al.,

2011; Rhodes & Nigg, 2011). This is problematic because PA is a complex behaviour where individuals need to exert themselves mentally and physically on a regular basis to experience the health-related benefits. This makes PA and sport adoption very different than the other behaviours from which these models were developed for.

In addition to having conceptual limitations, use of BCTs have also resulted in mixed results and modest success (Ma et al., 2021; Rhodes & Nigg, 2011; Rhodes & Pfaeffli, 2010). Rhodes and Pfaeffli (2010) analyzed 22 articles that used various BCTs. They determined that half of the studies failed to show a significant intervention effect on PA behaviour. Similarly, Prestwich et al. (2014) conducted an analysis of studies included in two systematic reviews to determine the extent of theory use in PA and dietary interventions, along with the associations between the extent and type of theory use and their impact on intervention effectiveness. It has been noted that theory use, and effective behaviour change through the use of interventions tend to be non-existent or weak, particularly when looking at long-term maintenance (Prestwich et al., 2014). Rhodes and Nigg (2011) also noted that there was limited success when BCTs were used as mediators between behaviour change and intervention. Furthermore, the commonly used theories do not specify how to use them to effectively facilitate behaviour change and create proper interventions (Prestwich et al., 2015).

While several limitations exist regarding the methodologies and theories used in behaviour change research in sport and exercise psychology, some researchers have suggested several ways to improve future studies. For instance, it has been stated that researchers need to be open to change, where they should look to adapt or augment pre-existing theories, or develop new theories altogether (Head & Noar, 2014; Rhodes, 2014; Rhodes & Nigg, 2011). The adaptation or augmentation of the theories would include the addition or removal of various

factors to ensure that the constructs would all have an association with intention (Head & Noar, 2014; Rhodes & Nigg, 2011). Interestingly, Rhodes (2014) stated that some researchers may not want to change for fear of yielding null or insignificant results, despite speculating that doing so may help advance the field. While this may seem like an effective route, if the theories are not specific to sport and physical activity to begin with, it is still likely that interventions based around these 'augmented' theories will continue to be ineffective and not yield long-term results.

Another important limitation to BCTs, is that they are effective in promoting short term behaviour change, but they fail to promote long-term maintenance and participation (Hutchinson et al., 2008). In this study, I developed a theory that explains how individuals sustain regular participation in sport and PA throughout adulthood. Specifically, the theory outlines behaviours related to sport and PA adherence using data from individuals who have successfully adhered.

Masters Athletes

One group of athletes, known as Masters athletes (MAs), might be particularly useful for creating theory regarding PA maintenance. MAs are a group of individuals that use sport and sport-related training to be regularly active throughout adulthood. To be classified as a MA, individuals must meet three criteria: (a) age, (b) formal registration, and (c) competitive orientation (Young, 2011). First, MAs must be over a sport-specific age (typically over the age of 35), with athletes aged 55 or older sometimes being referred to as Senior athletes. For individuals who compete in sports where the age of peak performance is younger, the age for registration tends to be younger. For instance, swimmers and gymnasts may begin competing as MAs at the ages of 25 and 22 respectively (Ferrari et al., 2016; Weir et al., 2010).

For the second criteria, MAs must be formally registered in identifiable and recognized events (Young, 2011). This can be done through registering in a league or club, along with

participating in community (or league) events, fully inclusive games, or championships, with the latter sometimes requiring performance-based qualification (Young, 2011). These events are often catered to MAs or older individuals with most sports/events being separated by age in 5-year groupings with varying degrees of competition.

Lastly, MAs need to be competitively oriented in their pursuit of PA and sport, which is often done through extensive training by the athletes (Young, 2011). Regarding their orientation to Masters sport, it is important that the athletes acknowledge that they are competitive and that they actively prepare for competition (Young, 2011; Young & Medic, 2011a). To help with their training and preparation for competitions, large amounts of MAs go to the extent of hiring coaches, where previous research has shown that approximately 70% of MAs train with a coach (Young & Medic, 2011b). Although all MAs meet the abovementioned criteria, they do not have the same trajectory into Masters sport participation. For instance, some MAs are lifelong athletes ('sport continuers'), others were athletes when they were younger, experienced a lapse in participation, and then re-entered sport later in life ('rekindlers'), and some never participate in sport until later in life ('late bloomers'; Dionigi, 2015).

Masters Sport Growth in Popularity

While Masters sport is relatively new, it has become one of the fastest growing sporting cohorts in western countries (Dionigi et al., 2011). One explanation for the recent growth of Masters sport is that the global population is rapidly getting older. For instance, in Canada, the percentage of the population aged 65 and older (18.0%) is higher than that of individuals aged fourteen and younger (15.9%). Additionally, the number of centenarians (i.e., people aged 100 or older) per 100,000 people has increased from 18.8 in 2001 to 30.0 in 2020 (Statistics Canada, 2020). The increased age of the population over the past several decades and the vast increase in

sport participation across the lifespan culminated in the creation of the first World Masters Games in 1985 in Toronto which saw over 8,000 participants from 61 countries competing in 22 sports (Weir et al., 2010). One of the more recent iterations of the World Masters Games occurred in 2017 in New Zealand where over 24,000 athletes competed representing over 100 countries (Wright, 2019), which is a testament to the growth in popularity and the athletes' abilities to adhere to sport.

Masters Athletes' Adherence

MAs have been noted as one of the few groups that have been able to maintain their sport adherence and regularly exceed PA guidelines (Deck et al., 2021; Weir et al., 2002; Young & Medic, 2011a). Sport adherence has been defined as "sticking to a self-disciplined, regular routine of sport activity" (Makepeace & Young, 2021, p. 89). Young and Medic (2011a) highlighted that 55% of elite MAs reported year-round involvement in their sport, with just under 90% reporting eight or more months of involvement (Young & Medic, 2011a). The researchers found that most of the athletes reported ten months of heavy investment and two months of light investment. When breaking down the time committed to sport, the athletes reported spending an average of 13.5 hours per week involved in their sports during the months of heavy investment (Young & Medic, 2011a). During these months, an average of 6.6 hours per week was spent in intense training that required vigorous and strenuous effort, and an additional 1.9 hours was spent in competition per week (Young & Medic, 2011a), all adding up to levels of PA that far exceed the nationally recommended guidelines.

MAs who participate in lower levels of competition have also reported large volumes of weekly training that exceed PA recommendations. For instance, Weir and colleagues (2002) noted that regional-level Masters swimmers spent approximately 5.5 hours per week training.

Similarly, Deck et al. (2021) obtained similar results, where MAs from various sports reported an average of 5.2 hours per week training, with nearly half of them attending 5-7 training sessions per week.

Considering that MAs regularly exceed PA guidelines and maintain their involvement in sport across their lifetime, they have the potential to serve as models of adherence to sport and regular PA. Given that MAs often have competing priorities in life (e.g., careers, families, etc.) and still exceed PA recommendations, understanding their behaviours and how they structure their sporting environment may offer clues for how others can also maintain prolonged participation in sport and PA throughout adulthood.

Masters Athletes as Models in Research

MAs have been used effectively in previous research to test and create various models and theories within the field of sport and exercise psychology. For instance, due to their ability to participate in regular sport and PA later in life, MAs have been considered by some to be models of successful aging (Rowe & Khan, 1997). For instance, Geard et al. (2020) compared MAs with non-athlete groups of adults on physical, psychological, cognitive, and social functioning, as well as subjective feelings about their aging – all used to assess successful aging. They found that MAs had significantly higher levels of physical and social functioning, and positive beliefs about their aging in comparison to non-athletes (Geard et al., 2020). In sum, MAs represent a group that can successfully age and present with higher levels of functioning in comparison to age-matched non-athletes, which may be higher because of their access to regular sport and PA participation (Geard et al., 2018, 2020). Geard and colleagues (2018, 2020) have also highlighted that MAs are effective in their ability to create and test various models within sport and exercise psychology.

MAs have also been utilized to study sustained performance. More specifically, several researchers have assessed MAs strategies for maintaining their sport performance using the Model of Selective Optimization with Compensation (MSOC) (e.g., Baker et al., 2007; Rathwell & Young, 2015; Schorer & Baker, 2009). Baltes and Baltes (1990) developed MSOC as a method for understanding performance throughout the aging process. The MSOC stipulates that individuals can maintain performance as one ages through three strategies: (a) selection, (b) optimization, and (c) compensation (Baltes & Baltes, 1990). Selection involves reducing the number of high efficacy goals to pursue so the athlete can focus more on other goals (Baltes & Baltes, 1990). Optimization occurs through increasing focus on training or practice on specific behaviours or movements to maintain performance, while compensation involves improving one area of a behaviour to make up for a decline in another (Baltes & Baltes, 1990).

Focusing on the abovementioned framework of sustained performance, Rathwell and Young (2015) conducted a case study on a 52-year-old MA, who specialized in long-distance running. Regarding selection, they found the MA picked sports to invest in through prioritizing certain activities that would help his performance. This was also done by not participating in other recreational activities that were not necessary during his season (Rathwell & Young, 2015). To optimize his training, the MA noted that if he was sore from running, that he would still go to the gym to workout. He also stated that if he wanted to do cardiovascular training without "hammering the hell out of his legs" (Rathwell & Young, 2015, p. 731) that he would use different machines such as the elliptical instead of running. Lastly, to compensate for the physical declines, the MA used his knowledge and experience to alter his techniques and training to mitigate his age-related losses.

Other studies have been conducted to further examine how older athletes compensate for their physical losses in particular sports. Schorer and Baker (2009) analyzed the perceptual-motor abilities of handball goalkeepers, comparing young elite, adult elite, and older former elite goalkeepers. It was noted that the older goalkeepers had slower reaction times than their younger counterparts, yet they still had similar eye movements when in net. Furthermore, the older goalkeepers would compensate for their age-related decreases by incorporating one of two strategies when trying to make a save: (a) making an early movement to get to the shot earlier but risk going the wrong way, or (b) waiting longer to make a save to ensure they go the right way, despite being slower (Schorer & Baker, 2009). Additionally, older golfers have also been found to compensate for their physical declines as they age. As golfers get older, there is a natural decrease in driving distance and ability to reach the green (Baker et al., 2007). To offset this decline, many golfers focused on their driving accuracy to ensure a better second shot (Baker et al., 2007). Many older golfers also used their past experiences and familiarity with their settings to compensate (Baker et al., 2007). While these studies have noted the effectiveness of studying MAs as models of sustained performance, it begs the question as to whether this is related to their ability to maintain participation and commit to sport.

MAs have also been used to study models of lifelong sport participation and commitment, such as the Sport Commitment Model (SCM; Scanlan et al., 1993, 2013). This model posits that there are two forms of sport commitment: constrained and enthusiastic commitment. Constrained commitment refers to participating in sport because one feels they must, whereas enthusiastic commitment involves participating because one wants to (Scanlan et al., 1993, 2013). The SCM also includes seven factors that are proposed to influence the two different types of sport commitment: sport enjoyment, valuable opportunities, other priorities,

personal investments, social constraints, social support, and desire to excel (Scanlan et al., 2013). Sport enjoyment is identified as positive affective feelings such as love and pleasure that are a direct response to an individual's sporting experience (Scanlan et al., 2013). Valuable opportunities refer to opportunities that are important to the athlete that are only present through their sport involvement. Other priorities are commitments that may compete or conflict with one's sport participation. These priorities may be attractive or pressing for the athlete, however, both will influence one's sport commitment (Scanlan et al., 2013). Personal investments allude to resources that an individual has put towards their sport participation and cannot be recovered by the individual when they stop participating. Social constraints are social norms or expectations that provide the athlete with an obligation to maintain their participation (Scanlan et al., 2013). Social support is the support that the athlete perceives that others provide which help them maintain their involvement in sport and lastly, desire to excel is the athlete's inclination to achieve excellence in their sport (Scanlan et al., 2013).

Rathwell and Young (2015) assessed the tenets of the SCM in the aforementioned case study. The participant noted that sport enjoyment, social support, and valuable opportunities positively influenced his sport commitment, with personal investment partially influencing him. In another study by Wigglesworth et al. (2012), the researchers examined the gender differences in the various factors that influence one's sport commitment in Masters swimming. Functional (enthusiastic) commitment was increased in women when they had increased sport enjoyment and personal investment. Obligatory (constrained) commitment was increased in both genders when MAs experienced high levels of social constraints, involvement opportunities (valuable opportunities), and involvement alternatives (other priorities). Personal investments also increased obligatory (constrained) commitment in women.

Furthermore, Young and Medic (2011b) and Santi et al. (2014) conducted studies to understand which social factors best influenced MAs' commitment to sport. Young and Medic (2011b) concluded that decreased pressure from spouses, children, and training partners, in combination with increased support from health professionals was beneficial for MAs' prolonged commitment to sport. Conversely, Santi et al. (2014) determined that support from coaches and teammates helped foster functional commitment, while increased coach restraints decreased commitment. Additionally, they noted that perceived pressure and obligation from both coaches and teammates increased obligatory commitment. While the SCM has helped us understand different factors that can impact a MA's commitment to sport, it does not address *how* they have been able to maintain their adherence and commitment. Thus, in this study, I aimed to create a grounded theory of sport adherence using data from MAs.

Grounded Theory

Grounded theory (GT) methodology is defined by Holt (2016, p. 25) as "a set of methodological approaches that include techniques and strategies designed to develop theory based on, and grounded in, data collected from people and in social settings." GT is typically used in three different situations; (a) when there are no theories available to explain the phenomenon, (b) when the pre-existing theories are ineffective at explaining the phenomenon, and (c) when the pre-existing theories were created using other populations or samples (Cresswell & Poth, 2018). There are three main types of GT: Glaserian (Glaser, 1992; Glaser & Strauss, 1967), Constructivist (Charmaz, 2006), and Straussian (Corbin & Strauss, 2015). The main differences between these types are evident in the philosophical assumption that underpins the research, the role of the researcher during data collection and analysis, and the extent of a

literature review that is conducted beforehand. It is appropriate for researchers to select the type that best aligns with their epistemological and ontological background (Weed, 2009).

Glaserian Grounded Theory

Glaserian GT (Glaser, 1992; Glaser & Strauss, 1967) was the first type of this methodology that was created and popularized. This type of GT is based in the process of letting the theory emerge from the data rather than using rigorous methodologies to create the theory. Glaserian GT is grounded in a realist ontology and positivist epistemology. A realist ontology refers to the assumption that there is a singular reality that exists independently of an individual's perceptions of it, and a positivist epistemology is the assumption that it is possible to achieve knowledge of the world through direct measurement and analysis of the phenomenon in question (Weed, 2009). In accordance with the concept of letting the theory emerge from the data naturally, researchers should not conduct a literature review prior to starting the study as it was believed that this process could lead to pre-conceived notions influencing the researcher throughout data collection and analysis, and the researcher should limit their interference during data collection (Glaser, 1992; Holt, 2016; Weed, 2009). Another aspect that is unique to Glaserian GT is the types of coding that is done by the researcher. There are two stages of coding in this type of GT: (a) substantive coding, and (b) theoretical coding. Substantive coding is the process where the researcher codes each segment of data. Afterwards, the researcher goes through the process of theoretical coding where they use coding families to establish relationships between substantive codes. Of the three types of GT, Glaserian is not typically utilized in the field with Constructivist and Straussian being more popular.

Constructivist Grounded Theory

Constructivist GT (Charmaz, 2006) is based on the idea of creating a theory through the interaction of the researcher's interactions with groups of participants and the multiple realities that make up the desired behaviour (Cresswell & Poth, 2018). Constructivist GT is grounded in a constructivist ontology and interpretivist epistemology (Weed, 2009). The constructivist ontology refers to the assumption that multiple realities are constructed through the experiences of individuals, and an interpretivist epistemology is grounded in the assumption that full knowledge of the phenomenon is not possible, and that an indirect knowledge is developed through the interpretation of observations and accounts of the phenomenon (Weed, 2009). Charmaz (2006) argued that in Constructivist GT, having preconceived notions from the research and literature could be detrimental to the process of GT, however, it was argued that it is impossible to do so as researchers very rarely have no knowledge of the field or behaviour prior to the start of the study. When developing a theory using Constructivist GT, the researcher interacts with the data and participant and that while the theory emerges through the data, that it is impossible to separate the influence of the researcher from the substantive theory (Charmaz, 2006; Holt, 2016). Analysis occurs through two types of coding, followed by theoretical integration. Initial coding is the first phase, where the researcher reads through the data word-by-word or line-by-line and provides a detailed description of it. Then the researcher goes through focused coding which is where the useful codes are selected and tested against further codes and categories are identified (Holt, 2016). Afterwards, theoretical integration occurs where the aforementioned categories are integrated into a theory (Holt, 2016). Constructivist GT is gaining popularity within the field of sport and exercise psychology (e.g., Battaglia et al., 2021; Cartigny

et al., 2019; Collins & Durand-Bush, 2019), however there is a more systematic and popular approach to GT that better aligns with the researcher's philosophical assumptions, Straussian.

Straussian Grounded Theory

Straussian GT (Corbin & Strauss, 2015) is one of the more predominant types of GT within the field of sport and exercise psychology (e.g., Kendellen & Camire, 2019; Knight & Holt, 2014; Roy-Davis et al., 2017; Tamminen & Holt, 2012) and presents as a rigorous and systematic process of creating a theory (Cresswell & Poth, 2018). Straussian GT is grounded in the realist ontology and interpretivist epistemology (Weed, 2009). A realist ontology is the assumption that there is a singular reality that exists independently of an individual's perceptions of it, and an interpretivist epistemology is grounded in the assumption that full knowledge of the phenomenon is not possible, and that an indirect knowledge is developed through the interpretation of observations and accounts of the phenomenon (Weed, 2009). In Straussian GT, a literature review prior to conducting the study is common practice as it allows the researcher to identify the rationale behind conducting said study (Holt, 2016). Furthermore, a literature review is often required for funding and ethics applications. While it is important in GT for the theory to emerge from the data, Holt (2016) argued that it is the interaction between the researcher and the data that leads to a substantive theory being created. Once data collection begins, analysis occurs through three types of coding: (a) open coding, (b) axial coding, and (c) theoretical integration. Using Straussian GT may be an appropriate method to help understand how and why MAs maintain sport participation in a time where large portions of the population tend to be inactive and sedentary. While this group remains active throughout adulthood and may be helpful in our understanding of how to adhere to sport, it is important to note that this group is not representative of the general population as a whole.

Limitations of Studying Masters athletes

MAs are uniquely able to participate in sport later in adulthood and are a desirable group to study in order to understand sport adherence. However, there are potential problems worth considering when taking results from MAs and applying them to the general population. More specifically, MAs tend to be white/Caucasian, highly educated (i.e., possess a post-secondary degree/diploma) and have a higher annual income than other populations of adults (Dionigi et al., 2012, 2013; Hoffmann et al., 2020; Larson et al., 2021; MacDonald et al., 2009; Motz et al., 2022; Patelia et al., 2019, 2023; Rathwell et al., 2020; Sheehy & Hodge, 2015). In the studies that reported on race or ethnicity, white/Caucasian was the predominant race with the percentage of participants ranging from 82.3-100% (Dionigi et al., 2012, 2013; Hoffmann et al., 2020; Larson et al., 2021; Motz et al., 2022; Rathwell et al., 2020; Sheehy & Hodge, 2015).

Regarding their education, 94% of Motz and colleagues' (2022) sample had some sort of higher education, with 44.2%, 34.5% and 15.1% having a graduate degree, an undergraduate degree, and a college diploma respectively. Likewise, Larson et al. (2021) noted in their study that 39% of their participants had an undergraduate degree, and 40% had a graduate or professional degree. MacDonald and colleagues (2009) conducted a study to determine whether demographic variables and previous PA influences current PA participation while comparing MAs and sedentary older adults. It was noted that significantly more MAs had a post-secondary education in comparison to sedentary older adults (91.7% vs. 33.3%). This finding coincides with previous research outside of Masters sport which shows that education plays a significant role in predicting sport participation (Breuer et al., 2011; Farrell & Shields, 2002; Kamphuis et al., 2008; Scheerder et al., 2006).

MAs also tend to report higher incomes than average. While there is limited data on the affluency of MAs, Larson et al. (2021) noted that 53% of their sample had an annual salary of greater than $100,000 per year. Similarly, in a study by Patelia et al. (2019), approximately 70% of their sample had an annual income of $80,000 per year or higher. The average income of MAs in both studies is notably higher than the mean income in Canada, which was $51,300 in 2020 (Statistics Canada, 2022). This led Larson and colleagues (2021) to note that having a higher income may be a common characteristic of being a MA, despite them recruiting swimmers with varying levels of competition.

While some of the strategies that MAs use may be a result of their socioeconomic privileges, some of their strategies may be transferrable to other adults who participate in regular PA and/or sport and are looking at ways to maintain their consistent participation. Additionally, it will be helpful for researchers to further understand what allows them to be unique in that they are able to regularly participate and compete in organized sport throughout adulthood, and in some instances across the lifespan.

Purpose

Given the noted benefits of regular sport and PA, increased age of the population, history of successful PA in Masters sport settings, and that the pre-existing theories are ineffective in creating long-term participation and are often created outside of sport and PA, the purpose of this study was to use GT to create a theory of sport adherence using data from MAs. This theory outlines various strategies and behaviours that influence Masters sport adherence. The research question that guided this study was: What strategies do MAs use to adhere to Masters sport?

Chapter 3: Methodology

Philosophical Assumptions

This study was grounded in ontological realism and epistemological interpretivism. Ontology refers to the nature of reality, and ontological realism refers to the belief that there is a singular objective reality, which is independent of an individual's perceptions, beliefs, and constructs (Cresswell & Poth, 2018; Guba & Lincoln, 1994; Weed, 2009). Since ontological realism relates to the belief that there is one singular reality, it is amendable to the concept of cause and effect (Cresswell & Poth, 2018; Guba & Lincoln, 1994). Therefore, with regard to MAs, I assumed the strategies that were employed would cause them to adhere to their respective sports based on findings from previous research regarding MAs' ability to commit to sport.

Epistemology refers to a theory of knowledge, which guides what we perceive knowledge to be and how we come to know said knowledge (Cresswell & Poth, 2018; Guba & Lincoln, 1994). Epistemological interpretivism refers to the idea that a direct knowledge of a behaviour is not possible to obtain, however, an individual's accounts and observations of the world may provide indirect explanations of the behaviour, where knowledge of the behaviour is constructed through interactions within the environment (Weed, 2009). For this study, I assumed that each MAs' perceptions of how and why they adhere to sport are likely to be different from athlete-to-athlete. Furthermore, these strategies may have been altered through the athletes' interactions with their environment (e.g., teammates, coaches, family, employers, etc.).

Methodology

Considering my focus on explaining MAs' conscious strategies for maintaining their sport adherence, a GT methodology was deemed an appropriate methodological choice for the study. More specifically, Straussian GT (Corbin & Strauss, 2015) was selected as the

methodology for this study because it aligned with the primary researcher's philosophical assumptions (Weed, 2009).

Straussian GT is a type of grounded theory that employs rigorous methods of data analysis and data collection with the result culminating in a substantive theory that explains a phenomenon (Cresswell & Poth, 2018). While some types of GT disagree with the researcher conducting a literature review prior to the study, in Straussian GT it is argued that a literature review is crucial to research as it provides the researcher with a rationale for the study. An important aspect of this methodology is theoretical sensitivity, where the researcher needs to ensure that their pre-conceived notions of the behaviour do not influence the data collection and analysis of the study. The researcher was cognizant of previous research that have discussed adherence in MAs (e.g., Dionigi et al., 2012; Makepeace et al., 2021), along with research using the SCM (Scanlan et al., 1993; 2013). However, in line with GT, I made effort to first allow the athletes to discuss what they believed influenced their adherence, as it was important for them to tell a story about their experiences with a specific outcome in mind (e.g., maintained sport participation). Only when transcribing the data, was the data linked to concepts from the pre-existing literature through memos. It was determined that this methodology allowed us to best understand how MAs adhere to their respective sports throughout adulthood.

Recruitment and Sampling

Inclusion Criteria

There were several criteria that athletes needed to meet to be included in the study. First, the participants needed to be at least 35 years of age. The choice to have a minimum age of 35 was informed by the defining criteria for MAs, where Young (2011) stated MAs are typically over the age of 35, however, this age differs depending on the sport. Furthermore, the athletes

needed to be working in some capacity, where their employment status was required to be either full-time, part-time, or self-employed. This was done to ensure that all the athletes had similar working circumstances, as this would serve as a similar barrier that the athletes would need to work around to maintain their sport participation and competition. Within this vein, I excluded anyone who was fully retired.

Consistent with Young's (2011) definition of MAs, I also ensured that my sample met the other two criteria for being a MA (i.e., formal registration and competitive orientation). Thus, the participants were screened to ensure they competed in rule-governed sports, as evidenced by registration in a league, club, or competition(s). Particularly, the athletes must have been involved in clubs or teams where training was accessible year-round (e.g., swimming, track and field, etc.). Participants must have also been competitively oriented in their pursuit of sport, meaning that they actively tried to win when competing (i.e., they were effortful in their competitions and tried to win their age category), and importantly, that they regularly trained for their respective sports.

To ensure that MAs sufficiently adhered to their respective sports, they were excluded if they did not regularly compete in Masters sport for at least 10 years (i.e., at least one formal competition in all years excluding those during the COVID-19 pandemic) or had experienced an extended lapse from their Masters sport participation in the last 10 years of competition. An extended lapse was defined as more than four consecutive months without sport participation or sport-specific training. More than four consecutive months was chosen as it has previously been noted that many MAs are involved in their sports for eight or more months per year (Young & Medic, 2011a).

Additionally, since previous research on MAs tends to include white individuals with higher educations from higher socioeconomic backgrounds, efforts were put into place to recruit a more diverse sample. Primarily, I recruited using email and conducted all phases on data collection remotely using Zoom (QSR International, 2022). This was done because it would ensure that the participants would have minimal barriers to participating (e.g., needing to commute for interviews).

Recruitment

Aligned with Straussian GT, recruitment was done through two phases: purposeful sampling and theoretical sampling. Purposeful sampling involves recruiting individuals based on the inclusion criteria to provide the researchers with an initial sample (Holt, 2016). Theoretical sampling is conducted afterwards as it involves a process through which the researcher recruits more participants to provide greater insight into the behaviour and the emergent categories, with the goal of this type of sampling being to refine ideas, not to increase the number of participants (Morse, 2007; Weed, 2009).

Prior to recruitment, ethical clearance was obtained. Afterwards, purposeful sampling was conducted between June and August 2022. Athlete recruitment began with the researcher identifying various Masters sport clubs through several web searches and the results of various Masters competitions. Once several clubs had been identified, they were contacted via email to invite their athletes to participate in the study as clubs were provided with a recruitment letter (see Appendix 1), and a link to an online consent form (see Appendix 2) and online screening questionnaire (see Appendix 3) that were hosted on Qualtrics. While recruitment was conducted across Canada, clubs in Western Canada (i.e., British Columbia, Alberta, Saskatchewan, and Manitoba) took priority due to their proximity to the primary researcher's host institution.

Following the first phase of data collection, theoretical sampling was conducted to recruit individuals from specific sports that needed greater representation (i.e., if one sport had less participants than others) and from the opposite gender if there was a great difference between them following purposeful sampling. Theoretical sampling occurred between September and December 2022.

Prospective participants were instructed to read an online consent form that was followed by the online screening questionnaire. Here, participants provided informed consent by clicking 'next' at the end of the consent form, thus proceeding to the screening questionnaire. The questionnaire asked various questions regarding demographic information and the study's inclusion criteria. Questions were split into two categories: personal information, and athlete information. The personal information category contained questions regarding their age, gender, and occupation. This section also included questions regarding their education history, income level, and ethnicity as previous research using MAs tends to be largely composed of highly educated, white individuals from a higher socioeconomic background. In the athlete information category, athletes were identified their primary sport (i.e., the sport they prioritized the most), and were then asked questions regarding the other sports they compete in, their competitive orientation, whether they have a coach, hours trained per week, etc. (see Appendix 3).

Individuals were invited to participate if their responses showed that they met the age criteria, they were working at the time, they identified as a MA, they had competed for 10 or more years in Masters sport, they dedicated eight or more months per year to their primary sport, they tried to win when in competition, they had competed in at least one formal competition per season, and they had not experienced an extended lapse in their competition or training within the last 10 years. Individuals who reported a lapse were contacted to clarify the reason behind

their lapse, and whether they still actively trained for their primary sport. Those who stated that they still regularly trained for their sport during their lapse were deemed to meet the inclusion criteria, as many athletes answered 'yes' to having a lapse due to the lack of competition in 2020 and 2021 as a result of the COVID-19 pandemic.

Participants

A total of 55 individuals completed the online screening questionnaire. These individuals' responses were screened, where only those who met the inclusion criteria were invited to participate in an interview. Participants were excluded for several reasons such as being retired, not trying to win when competing, having a major lapse in their participation, or not answering all of the questions. Furthermore, several athletes were invited to participate in the interview process and either declined or did not respond.

Following the first phase of recruitment, ten athletes (six female, four male) agreed to participate in the study and met the inclusion criteria. Interviews during this phase occurred between June and September 2022. These athletes competed in triathlon/long-distance running (n = 4), swimming (n = 3), track and field (n = 2), and rowing (n = 1). Theoretical sampling was conducted to obtain a greater number of athletes from rowing (or other paddling sports), and track and field, with the hopes of having similar amounts of participants from each sport. Additionally, a greater emphasis was placed on recruiting male participants in an attempt to have an equal number of men and women. Following theoretical sampling, an additional four athletes who competed in paddling sports (n = 3), and track and field (n = 1) were recruited to participate. Interviews during this phase occurred in December 2022. Despite the efforts to have an even amount of male and female athletes, three additional female athletes met the inclusion criteria, and only one of the prospective male participants met the criteria.

This study had a final sample of 14 MAs (nine females and five males) with an average age of 53.64 (*SD* = 8.38), ranging from 36 to 65 years of age. Most of the athletes identified as being white (*n* = 12, 85.7%), with one athlete identifying as Asian-Canadian, and another identifying as Metis. The majority of the athletes reported being married or in a common-law relationship (78.6%), with two responding as single, and one as divorced. All the participants reported having a post-secondary degree or diploma, with 14.3% possessing a college diploma and 85.7% having a university degree (28.6% Bachelor, 42.9% Masters, 14.3% Doctorate). Four participants preferred to not disclose their income. Of the remaining ten participants, all reported having an income of higher than $60,000 CAD, with seven athletes (50% of the total sample) reporting an annual income of greater than $100,000 CAD.

Regarding their athletic information, athletes noted their primary sport as paddling (rowing, canoeing, kayaking, *n* = 4), triathlon/long-distance running (*n* = 4), track and field (*n* = 3), and swimming (*n* = 3). Athletes averaged 16.4 years of Masters sport experience, with the athletes reporting on average 8.3 hours per week, and 11.4 months per year in their primary sports, and 9.8 hours per week and 11.6 months per year across all sports. Participants reported various levels of competition, with international (*n* = 2), national (*n* = 6), provincial (*n* = 3), regional (*n* = 2), and recreational (*n* = 1) athletes all participating. Nine of the athletes were currently being coached (64.2%), and three others reported being coached in the past as an MA but not currently.

When looking at the athletes' trajectories that they took upon entering Masters sport, eight of the athletes (57.1%) were 'sport continuers' (Dionigi, 2015) who reported participating in organized sport when they were younger and continued this participation through Masters sport. Four of the athletes (28.6%) were 'rekindlers' (Dionigi, 2015) that reported participating in

organized sport when they were younger but stopped for several years before joining Masters sport after their lapse. Lastly, two of the MAs (14.3%) were 'late bloomers' (Dionigi, 2015) and who started participating in organized sport as a MA.

The MAs that participated in the study averaged spending just under $3,000 CAD per year for their participation in Masters sport due to travel, club fees, equipment, etc. One athlete was not included in the calculation of average spending as she reported spending anywhere from $1,500 to $16,000 per year depending on what open water swimming events she wanted to compete in on a year-to-year basis. Table 1 provides demographic and sport-related information for each participant.

Procedure

Data collection was conducted through semi-structured interviews from July 2022 to April 2023.

Semi-Structured Interviews

Data collection was conducted using one-on-one semi-structured open-ended interviews using the online video communication platform, Zoom (Zoom Video Communications, Inc., 2022). Interviews are a common method of data collection in qualitative research, where the researcher(s) engage in a conversation with one (or multiple) participants with the goal of obtaining stories, accounts, or descriptions regarding their perceptions or experiences with the intended behaviour or phenomenon (Smith & Sparkes, 2016). Semi-structured interviews refer to a type of interview that has a limited pre-set structure going into the interview process, however, the researcher often uses open-ended questions to facilitate responses from the participant regarding the behaviour (Smith & Sparkes, 2016). This structure allows the researcher to ask about topics that interest them yet affords the participant opportunity to guide the interview through their interpretation and answers.

Table 1

Participant Demographic Information

Participant	Raymond	Joan	Darryl	Cecilia	Zoey	Lauren
Age	55	61	65	50	36	43
Gender	Male	Female	Male	Female	Female	Female
Ethnicity	White	White	White	Asian	White	Metis
Annual Income	100-120k	60-80k	N/A	N/A	60-80k	100-120k
Education Level	Bachelors	College Degree	Doctorate	Masters	Doctorate	Masters
Primary Sport	Triathlon	Rowing	Track & Field	Triathlon	Swimming	Swimming
Other sports	Cycling, Swimming	N/A	N/A	Swimming	N/A	Running, Cycling
Level of Competition	National	International	National	Local	National	Provincial
Years in Masters Sport	20	27	15	15	11	10
Months per year in primary sport	11	11	12	10	8	12
Hours per week in Masters sport	10	10	8	10	10	4

Claire	Serena	Calvin	Amanda	Sherry	Lydia	Reggie	Todd
57	62	58	44	48	57	61	54
Female	Female	Male	Female	Female	Female	Male	Male
White	White	White	White	White	White	White	White
N/A	N/A	100-120k	100-120k	60-80k	>120k	100-120k	>120k
Masters	Bachelors	Bachelors	Bachelors	College Degree	Masters	Masters	Masters
Canoeing/ Kayaking	Canoeing/ Kayaking	Track & Field	Canoeing/ Kayaking	Long-Distance Running	Track & Field	Long-Distance Running	Swimming
Hockey, Golf	Sailing	N/A	N/A	N/A	N/A	Triathlon, Cycling, Swimming	Triathlon
National	National	Provincial	National	Recreational	International	Local	Provincial
26	10	13	13	13	17	25	15
12	12	12	12	8	12	12	12
6	10	4	6	8	15	4	10

A pilot interview was conducted prior to the start of data collection to provide the researcher with an opportunity to practice their interview skills and to test the interview guide (Sparkes & Smith, 2014). The first interview acted as the pilot interview, however data from this interview was included in the analysis. Interviews with new participants were conducted until theoretical saturation was achieved, a point where further data collection doesn't bring forth any new insights (Charmaz, 2006).

Interview guide. Prior to the start of the interviews, participants were reminded of their rights as a participant (e.g., voluntary participation, right to withdraw, etc.). Once the interview began (for interview guide, see Appendix 4), the researcher asked a few questions about the participants' athletic history to clarify anything omitted on the demographic questionnaire and to help establish rapport. Once the questions about their demographic questionnaire responses had been answered, the interviewer asked questions regarding the strategies that they used to adhere to sport. The goal with these questions, as is consistent with grounded theory, was to engage the participant to tell a story about the intended behaviour (i.e., sport adherence). Probing was used to get the participant to go into greater detail regarding each of these strategies. Participants were also asked about their routine prior to training and competition, and whether they perceived that their sport participation was influenced by where they live, and their jobs, friends, or family.

The participants were also asked about how they first entered or became engaged in Masters sport which was done to help the participant reflect on their experiences from at least 10 years prior and to help distinguish whether some of the strategies are useful only when an athlete first begins to participate in Masters sport. Due to iterative nature of GT, and the fact that analysis and collection occur simultaneously, structured questions were asked at the end of the interview about specific concepts or strategies that arose through coding the previous interviews.

This was done to further define the existing codes and ensure that they were sufficiently saturated upon the completion of the study.

Multiple Interviews. When using GT, the researcher should look to conduct a higher number of interviews (~20 or more) to saturate their theory (Holt, 2016; Smith & Sparkes, 2016). This was done primarily through theoretical sampling; however, some athletes were invited to participate in a follow-up interview. These individuals were selected based on their transcripts and whether they did not discuss some of the strategies that emerged in later interviews. Six athletes were invited to participate in a follow-up interview to discuss strategies that arose in later interviews or to further discuss strategies that had come up in their first interview. Of the six, five athletes agreed to participate in a follow-up interview. Additionally, one athlete requested to meet with the primary researcher to further discuss their participation in Masters sport. The follow-up interviews occurred between February and April 2023.

Interview Summary. In total, 20 interviews were conducted. The first interviews with participants ranged from 49 to 110 minutes and were an average of 66.35 minutes in length (*SD* = 15.66). Six athletes participated in a second interview, these interviews ranged from 26 to 57 minutes and were an average of 38.06 minutes in length (*SD* = 10.66). Once interviews with a participant were completed, they were transcribed verbatim, sent to participants for member checking, and prepared for data analysis.

Data Analysis

In accordance with Straussian GT principles, data analysis occurred simultaneously with data collection, thus ensuring that the iterative process of Straussian GT was maintained (Corbin & Strauss, 2015; Holt, 2016; Holt & Tamminen, 2010; Weed, 2009). Audio and video from the interviews were recorded on Zoom (Zoom Video Communications, Inc., 2022) and transcribed

verbatim using Microsoft Word. All coding was done using the qualitative data analysis software, NVivo (QSR International, 2022). Participants were sent their transcribed interviews via email following transcription as a method of member checking. This was done to provide participants with the opportunity to omit or edit anything from the interview should they wish to do so, as well as to ensure the transcript accurately depicts the interview process from their perspective (Smith & McGannon, 2017). Participants that emailed in response with edits or stated that they had nothing to add or change, were analyzed immediately. Transcripts in which the participant did not respond were given three weeks before analysis began. In accordance with the GT methodology, data analysis occurred through three different methods: *coding, memoing,* and *constant comparison* (Weed, 2009).

Coding involved three strategies that are distinct to Straussian GT: open coding, axial coding, and theoretical integration (Corbin & Strauss, 2015; Holt, 2016; Holt et al., 2012). Open coding refers to the process in which the researcher reads all the transcribed data to ensure familiarity with the strategies that the participants alluded to during the interviews. The data from the transcripts was assigned a code which was descriptive of what was said. For example, if an athlete talked about having the ability to leave work early for training if they needed to, this was coded as *leaving work early to attend practice.* Axial coding then occurred afterwards, the codes from open coding were grouped into larger categories based on similarity (Holt, 2016). For instance, all codes that discussed leaving work early, or taking longer lunches to accommodate for training were grouped into categories called *flexibility with work*. Following axial coding, theoretical integration took place where the researcher refined the theory itself by providing greater depth to the categories (Holt, 2016; Holt et al., 2012). In this stage, all work-related categories were grouped together and placed with other environmental factors that influenced

sport adherence. This process took place until theoretical saturation was achieved, and the theory could not be refined any further.

Memoing represents another fundamental process of data engagement in GT (Weed, 2009). This process allows the researcher to explore and theorize the research pattern and the emerging theory. Memos are used to help conceptualize the data through the analysis process by generating categories, questions, and areas for further exploration or consideration (Lempert, 2007; Tie et al., 2019). The memoing process occurs throughout data analysis and collection, however, initial memoing tends to be speculative at the beginning and then becomes more grounded in the data as it emerges (Corbin & Strauss, 2015). Memoing was completed during the analysis and collection process, where the researcher took notes regarding how the various codes or pieces of data fit within specific categories that were broken down to outline the various adherence strategies. Furthermore, this process was done to identify how the various categories or strategies would fit with one another in a theory, and it culminated with the potential theory being drawn on several occasions to understand how the substantive theory may look.

Constant comparison was used to ensure that the data collected from the interviews corresponds with the intended behaviour. This was done by comparing newer data with previously collected data (Holt, 2016). This then led to codes being compared with codes, and categories being compared with other categories as the substantive theory was being developed. Later in the data analysis process, the researcher compared the emerging concepts and categories to the pre-existing literature which allowed the researcher to engage with the data and work towards constructing their substantive theory to explain the desired behaviour (Holt, 2016). Furthermore, this was used in combination with memos to understand how the emerging theory

and categories were relatable with the pre-existing research on sport commitment, adherence, and social factors of Masters sport.

Data analysis and collection occurred simultaneously until theoretical sampling was reached, which is a point where further data collection does not provide any newer insights (Corbin & Strauss, 2015; Weed, 2009). It was determined that following several interviews with new participants, and six follow-up interviews that no new adherence strategies had been discussed and that each category was sufficiently saturated.

Qualitative Rigour

Once data collection and analysis were completed, steps were taken to establish that the substantive theory was of a high quality. Fit, relevance, work, and modifiability functioned as the method of quality assurance in GT (Glaser & Strauss, 1967). The researcher needed to ensure that the substantive theory that was generated closely fit the behaviour, in this case whether the theory outlines the strategies that MAs use to adhere to sport. This was done through constant comparison, theoretical saturation (Weed, 2009), and ensuring that interview questions were focused on adherence strategies. Relevance refers to the extent to which the theory utilizes the real experiences of the participants (Weed, 2009). This was ensured through 'member checking', where the participants were instructed to make sure that the transcripts accurately reflected the interview and their experiences as a MA. Work refers to whether the theory can accurately provide analytical explanations for the behaviour. To ensure this, the researcher met with two experts in the field to seek feedback on whether the GT (and its categories) accurately portrayed the experiences of MAs, and whether it would be useful to help other MAs adhere to sport. The experts noted how the substantive GT was consistent with their experiences with MAs and previous research in the field. Lastly, modifiability is where the substantive theory is open to

extension or modification to accommodate new insights or new data from future research (Weed, 2009). This was ensured as the population that was used to create this theory only focused on athletes from individual-based sports. By extension, other research that studies the adherence strategies in athletes from team-based sports or different populations could provide greater depth or different results and be included in a revised theory.

Chapter 4: Results

The results from the interviews were used to create a Grounded Theory of Masters Sport Adherence (see Figure 1). The grounded theory is composed of 3 factors that influence Masters athletes' adherence to Masters sport: (a) *personal adherence strategies*, b) *social factors*, and c) *environmental and contextual factors*.

Personal Strategies

Personal strategies refer to the behaviours and the choices that MAs make that help them maintain their participation in sport. MAs discussed seven personal strategies related to their sport adherence: *selecting sports*, *registering for events*, *scheduling and tracking*, *creating routines*, *setting goals*, *listening to your body*, and *cross-training*.

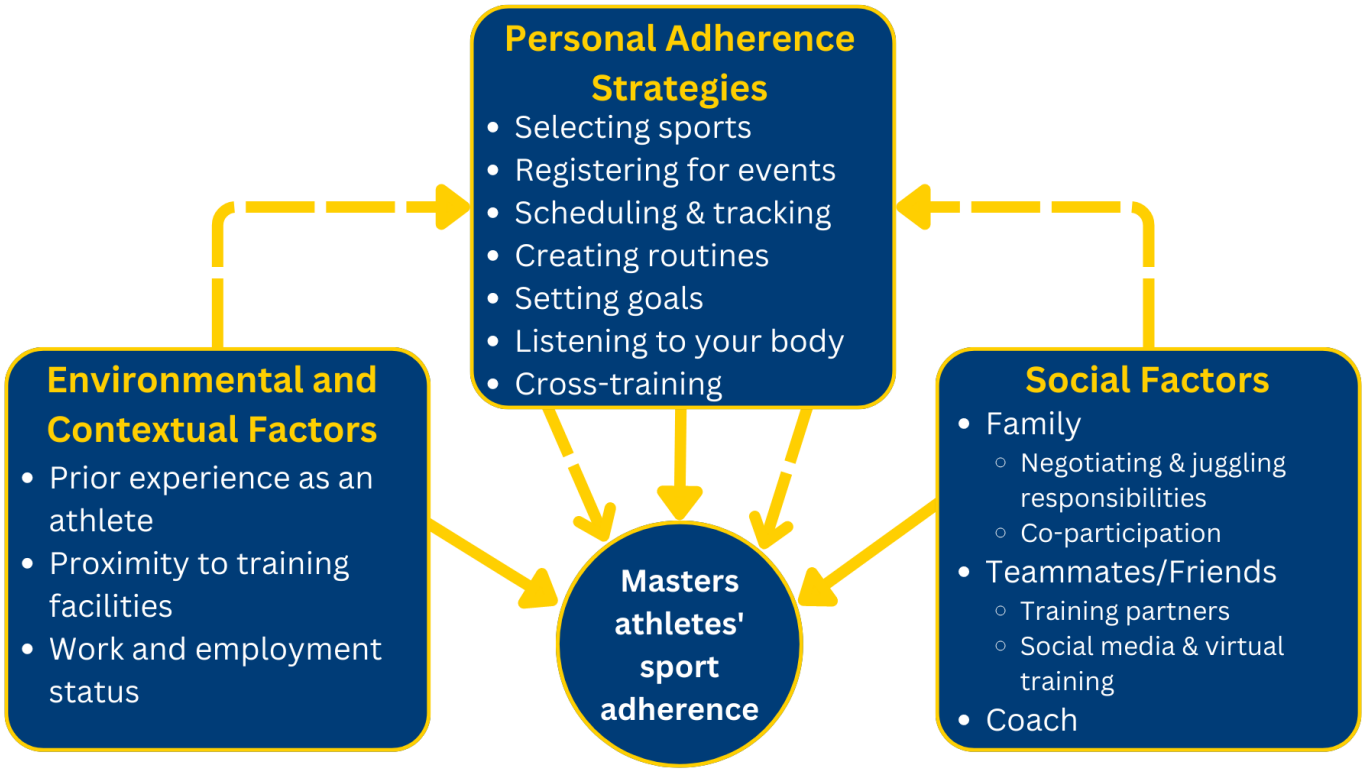
Selecting sports

The first personal strategy related to sport adherence that MAs spoke about was being deliberate in choosing the right sport. When selecting a sport, MAs considered logistics and their personal motivations. From a logistical perspective, MAs deliberately chose a sport that didn't conflict with major responsibilities in their life such as work. For some MAs, who had established work schedules, they chose sports where the typical training sessions and competitions fell outside of their work schedule. For instance, Amanda started sprint canoe and kayak because the peak season was in the summer and she worked as a teacher, and thus, was not required to work when her sport was most important:

> So you know definitely the vacation time available to me as a teacher and the day-to-day life of a teacher merges really well and I knew that, like it was part of the reason why I thought this is a good sport for me if I'm learning a new sport … my mom had said 'oh you might like this' and a lot of other people said 'oh you

Figure 1

Grounded Theory of Masters Sport Adherence



Note. Within the above theory, solid lines are used to note where there is a direct influence of sport adherence. Dotted lines are used to show an indirect pathway where either *environmental and contextual factors* or *social factors* influence the creation or use of *personal adherence strategies* which then influence their adherence to Masters sport. Within social factors, the bigger text refers to the social agent, and the smaller points are the adherence strategies that involve that individual or group.

should try this, you might like this' and I didn't for a few years because I was working shift work and then finally when I became a teacher I was missing competitive sport and so I thought that it would be perfect for me and I was going to try it out, but I thought I have my summers off and so it fits perfectly into my schedule as a teacher.

For other MAs, the choice to adapt to their work schedule was more reactionary. In fact, Darryl switched sports on several occasions due to his work schedule, which allowed him to maintain his participation in Masters sport for over a decade. Specifically, Darryl switched from long-distance running and sprint triathlons to rowing when his work demands were high, but later switched to track and field once his work schedule was more manageable:

So, when I was working full-time the track schedule didn't work for me because I couldn't get there at 5 o'clock three days a week. And that's when I started rowing, just because it was later on in the evening, but then when I started working less, I switched over to track just because I could get home at 7:30 instead of 9:30 or 10:00.

Similarly, at the time of their interview, Lauren contemplated switching sports because her new job was making swimming on a regular basis more difficult:

I think I might actually switch sports and get into triathlons again because one of the reasons why I got away from triathlons is because it's just hard to run and cycle on a treadmill and a stationary bike all winter and there's not a lot of races, like there's not races in the winter. Well here in [new city of residence] there are literally triathlons everywhere. And with my new work schedule, I don't know if

I'm going to be able to get in the pool as much as I normally do, I just maybe would be able to go for a run instead.

When prioritizing sports, MAs also spoke about the importance of picking sports that they felt their body could withstand. This involved changing sports to improve performance, or selecting a different sport due to injuries that were sustained when they were younger (i.e., youth or early adulthood). For example, Raymond, switched from being a cyclist to competing in ironman races and triathlons because he thought his body was better suited for success in longer competitions:

> Being a 55-year-old guy still trying to be competitive, I realized that my slow twitch muscle makeup now is far more advantageous than fast twitch and so I'm realizing to take advantage of the fact that I've got a big engine and so the Iron Man is tailormade for exactly that, right? It's a long, slow drag race … you know at our age you got this slow twitch V8 engine and why not take advantage of it you know, use it instead of throwing in the towel.

Other athletes chose sports that would not aggravate their injuries in order to compete for an extended period of time. For instance, Todd chose swimming as his primary Masters sport because injuries limited his involvement in triathlon, "my knees are getting worse and so I don't run. I do one triathlon a year and it's a sprint distance so it's only a 5km run and I just do it that day and that's kind of it. And so, I've transitioned into more swimming." This sentiment was mirrored by Darryl who switched from participating in longer distance running events to sprinting events when he began track and field:

> I mean I did 400 meter in high school but then I got into longer distance and that was my thing. I'm not like the most explosive sprinter, but just at this age I think

> it's just too much wear and tear on the body with that much volume. We also have a distance group within our club that goes 800 meters and up, and yeah, I just don't think I could hang in with those guys. You know, they just go round and round and round and so I think it's more body preservation that puts me in the sprints and it might not be perfectly suited for me, but it's easier on my body.

While the MAs chose sports that their bodies would be able to do long-term, some athletes noted that from a motivational standpoint it was important to choose sports that provided opportunity for improvement, even as one ages. The idea of improvement or participating in a sport that is technical and challenging helped the athletes sustain regular participation as they were motivated to master the various sport-related skills or techniques. For example, after trying sprint canoe and kayak, Amanda noted how difficult the sport was and how she was not going to get bored of it:

> I just felt like there was something about this sport that pushed every button in me to say like you need to conquer this and then when I started it, it's so hard, like it's such a hard sport … and so for me, I'm very competitive and there was something about it that made me want to be good at it and I just didn't accept it because it was so hard and I was seeing these other ladies who could do it. I was like 'I want to be badass like those ladies,' I just wanted to be like that, and I really liked the fact that it was so difficult and technical because what that told me was that I wasn't going to get bored of this work. I knew that it was going to hold my attention for years, and in the end it's funny because I always identified as being a track athlete, and now I've done paddling way longer than I ever did track.

Similarly, Cecilia, a former long-distance runner who transitioned to triathlon, discussed how triathlon provided her with an opportunity to learn and improve:

> You can always learn in one of the disciplines so I find that open water swimming is quite challenging, and I would say there's always new techniques, even in biking. Like running, I've done my whole life you know from university on, but swimming and biking is still fairly new for me, and I can always learn in those areas.

Registering for events

After choosing which sport(s) to compete in, MAs then made a conscious effort to register in events to guide and structure their training in the lead up to competitions. Joan, talked about how she began Masters rowing because she wanted to compete in an international Masters rowing competition that was going to be hosted near her city of residence. Joan said, "the [international competition] came and I started to train for them and since then I've been training in and racing in rowing every summer since." Similarly, Cecilia discussed how she signed up for a half Ironman, which then forced her to start training for triathlons:

> Well, I ended up in triathlon because I signed up for a half Ironman, so I signed up and then I started panicking after because I didn't have any of the triathlon stuff. I didn't have a bike, I didn't know how to swim well, so I had to keep training because I was signed up for a race. I signed up, I think in December and the race was beginning of July, so I guess my strategy was to be able to complete the race. So I signed up with a triathlon group and that helped quite a bit.

The MAs described that having a competition or event was a deliberate strategy for remaining motivated in their regular training sessions. Some athletes spoke about how signing up

for competitions made them train more consistently because they had to pay for them. For instance, when asked what she would recommend for other MAs to maintain participation, Cecilia responded "pay for it, because then you feel obligated to go." Others described how events and competitions kept them motivated because they didn't want to perform poorly in front of others. As Lauren said:

> I always enter an event or race, like whether it's swimming or running or whatever, I usually have some kind of a race coming up to scare me into practicing or training so that I don't embarrass myself at the event.

Some athletes described that signing up for events and telling people about it kept them accountable. As Sherry described:

> You commit, and you tell people you're doing it too. It's not just about paying the money for it. It's also about being like 'well hey, I just signed up for this half marathon.' So people are expecting you to go out and run this half marathon.

Even as athletes got more experienced in Masters sport, they still used this strategy to help them adhere, and often enlisted their coaches to help them identify which competitions to compete in. Once the competitions were identified, the athletes (and their coaches) would use these dates to structure and schedule training sessions so that the athlete would be at their peak performance for their competitions. For instance, Lydia elaborated on how she identified competitions with her coach a year or more in advance:

> I'll sit down, and have a conversation with [her coach] about what races I want to hit in the next year and send them to him and we'll talk about it and then he'll set up the program and it depends on what's going on internationally … so sometimes it's very different distances, and what I try and do a year or two in

advance is kind of start plotting things, right? So, well 'where's Masters Nationals in the States in 2024?' and just start looking for stuff, what's reasonable for me to go to from a cost perspective and from a timing perspective.

Darryl, would also identify certain events that he wanted to compete in, and then his coach would structure a training program to ensure they would be ready for their race:

> There are certain events that you just get to know about, and you know, these are key events that you want to compete in and do well at, so you then tell the coach 'OK, here are these four events that are the ones that I want to participate in,' you know, 'what do you think about the timing?' 'Yeah it'll work' or 'it won't work,' and maybe one of your events isn't actually a peak event, it's just an event that you're going to go and you know go through the process of the event and you decide that with the coach and maybe have some key events and then he goes away, and he builds a calendar, which is like an annual calendar, a monthly calendar, all the way down to a daily calendar.

In addition to registering for events as a means to motivate the athlete to train, one athlete, Zoey, also identified international events to compete in as she was also motivated by the travelling aspect of Masters sport:

> I find travelling is motivating for me, like the idea of paying for a flight to do a swim is quite motivating because you're investing in your swim … like on Saturday I'm going to try and sign up for a swim in Tennessee because I think it's hilarious, like it's not beautiful but it's a fun and popular swim. So, I'm swimming it because I think it's hilarious and I want to go to Tennessee.

Scheduling and tracking

Once athletes registered in the events, the next step was to schedule and track their training sessions. The MAs often relied on the use of calendars or online schedules (e.g., Outlook, Microsoft Excel) to manage their training sessions and ensure that they regularly attended them. Darryl described how having a schedule with his training sessions kept him accountable:

> If I'm planning out my week on my own, and I make a calendar, I'll just follow along and I'll have made that calendar based around what my activities are going to be during the week and I kind of follow it. When it's just left up to me, like if I haven't thought about it, I just got up and said 'hey, I wonder what I'll do today?' I wouldn't be as organized in my workouts and focused. So, for me I need some sort of accountability … I'll say 'OK, Sunday is my planning day,' and I'll plan out my week and I'll write it down and then I'll be more likely to follow it than if I just do it by the seat of my pants … I think for all people it's really easy to find dumb reasons and good reasons to not do your workout. So, when I have my track practice at 5:30, I will maybe miss 5% of them you know for family issues or whatever. But I think if I just said to myself 'I'm going to go and workout every day at 5:30,' I'd probably miss 40% of them due to family and other matters. So, I think just making it a little bit more accountable and being able to say to people 'well, I have my workout at that time so can we do it later?' just helps me a lot.

Similarly, Cecilia noted how she schedules her training sessions in Outlook, despite being an athlete her whole life:

> I always schedule it in my calendar, so I'll use Outlook calendar and schedule when I'm training, not necessarily the details of the workout, like I still have one now with which times I'm swimming and what days I'm running and which days I'm biking. Like I kind of keep that schedule … because if it's in my schedule then I don't really have any excuses to not train.

Raymond created his own Excel spreadsheets to schedule his training sessions for the upcoming week:

> I got those spreadsheets, you know what, I find that super helpful if I have that, it's almost like a journal entry. Like at the beginning of the week I'll kind of insert 'on Wednesday I'm going to do that swim, 2000 meters. Thursday, I'm going to run.' If I put it in there, I find I'm more accountable.

In addition to scheduling sessions, MAs also spoke about the importance of tracking their motivation and performance. For instance, Raymond compared his spreadsheet to a journal:

> Say my goal is to train eight hours this week and you plan out your week, and then sometimes I find that my motivation that when it's getting tough in those last couple workouts, you're exhausted right? You're like no, I got to hit that, you know, I got to hit that eight hours this week. I got to get those workouts done and then you do that one and you're like 'yes, I did it.' … and just the process of typing the workout in Excel, it's like journalling right? Sort of just recording it is satisfying. Yeah, I don't know what it is, I just get a buzz off it but it's just like affirmation. 'OK, I did this, boom it's in my journal, it's in my spreadsheet.'

Conversely, Amanda tracked her training volume as it allowed her to gauge her fitness levels at various points of the season and to take care of various ailments or injuries so she could understand when the soreness or pain would set in:

> I do have an app that I like to use because it shows me how far I've gone … physically my knee is sore and your back and your hips and everything gets sore staying in that position so I like using the app because it tells me and lets me know when that pain is starting to set in, like at what kilometer and then it also lets me know like at the beginning of the season I'm feeling it around kilometer three and the you know midseason I'm like 'oh, I can do six or seven kilometers today' and I can use that to gauge my fitness. So I tend to use it to sort of figure out at what point am I starting to run out of steam and my body is really starting to hurt and so that's what I use it for.

Creating routines

Once athletes were scheduling (and completing) workouts on a regular basis, it helped them create routines which further helped them adhere to Masters sport. While the athletes would often have their workouts scheduled for specific days, they had to navigate the different priorities or responsibilities in life in order to find the time to complete their scheduled training sessions. For instance, Calvin often trained before or after work:

> I'm a little bit more active in the mornings, so it worked out well with my wife getting up and going to work, then I can just work out before I get to work. Yeah, and then to have that little bit of downtime after work after 4:30 before you go to practice at 6 o'clock, so that's the way I can squeeze both things in, right?

Reggie, also noted how he would change his routine on a day-to-day basis that fit with this teaching schedule:

> It sort of goes with my school schedule. So currently, I teach at 8 o'clock on Monday, Wednesday, Friday and so those are my days to run. Monday and Wednesday I'll run but I just have to make sure I run early. Tuesdays and Thursdays I'll swim every week and then Saturdays is always a long run and then the odd Friday I'll run but I often take that as a partial rest day too.

In addition to work, many athletes talked about having to create a routine that would allow them to train without interfering with family time. For example, Todd used to train during lunch at work, but now trains in the morning as it leaves his evenings open, a time of day that he can spend with his family:

> The lunch hour worked well. You know 15 years ago, the kids were a lot younger, so the lunch hour wasn't really imposing on kid time as long as you didn't stay too late finishing up work and then likewise now, morning swims right, they're sleeping. They have no clue what I'm doing … it's a time of day that doesn't impose on family time either. So yeah, it works from that perspective both the lunch hour and the early morning.

One common way that athletes navigated these different priorities was by creating a routine, which often involved training first thing in the morning. Joan elaborated on how training early in the morning allowed her to be more consistent with her sport participation:

> It's always early in the morning so I get up and I have a coffee, and I ride my bike down to the club. So, I don't have time. I like the morning because there's no time to think about what you're doing. You're just getting up, you're going rowing. I

> find that is a big motivator. If somebody wanted to row later in the day, I would find that much more challenging, so I pick a time of day [where there] isn't really anything else going on. There's no other demands of my time and it's the first thing of the day, right? If I start doing other things and then think about going rowing that would be very challenging to me. Like it's easy, I just get up, go row, and that's that.

Lydia also felt it was better for her to train in the morning than at other times of the day, "So the strategy I have now from a workout perspective is I need to train first thing in the morning … on an ongoing basis it's really best if I get the workout in first thing because otherwise it's less likely it'll get done."

Cecilia, trained every morning in her garage in addition to structured training that occurred in the evenings, "I go to my garage every day, every morning, like it's just my routine." The morning workouts were also helpful for the rare occasions that she had to miss evening training, "like the mornings I never miss. So I always know that, you know, if something happens later in the day or in the evening, it's OK because I've already had at least some sort of a workout."

Once athletes had created their routines, training became habitual and didn't require much thinking. For instance, Serena stated, "things like routines certainly help. You know when I do my morning run, you know you have your own sense of discipline but when it became a routine, it's like a no brainer, I get up, I put my running shoes on, and I go." Thus, MAs emphasized that sticking to their routine was of the utmost importance. This was evidenced by their dedication to training most days, particularly when they were out of town for work or vacation. Cecilia discussed that she trained less while out of town but still managed to maintain her routine of training in the morning:

> I train all the time, I love going for runs in new cities … So yeah, I'll still train. Typically, I'll just do it in the morning. Typically, I won't do two workouts a day when I'm on vacation or at work, like I'll just get my morning one in and a lot of it's really hard to swim because they don't have the amenities or they're far away or they're hard to find. Yeah, so your best bet is just finding a hotel that has a decent sized pool I guess, which is also very difficult … So yeah, I'll do more biking and running than swimming.

Lydia, also discussed how she scheduled the activities for a day on vacation around her training:

> We were on vacation, for example, and [husband]'s just saying, 'so, are you working out tomorrow and how long are you going to be?' and so we plan around it in a sense, but it works for both of us because I like to train and he likes to just sit and relax and kind of ease into the day, you know? So, it works for both of us, we both have our alone time and so yeah, it works fine.

Having routines also made it easier to return to sport or training when other priorities interrupted their participation. As Todd said:

> Does that mean I went for a week without training? Absolutely. You run into that 'I don't feel like it' or work is in the way, life is in the way, but it's there, it's the routine. You'll work your way back to that and you find a way to make it happen.

Lauren associated the idea of coming back to your routine with jumping back on the bandwagon when she had to miss training:

> I guess just the standard, like I think all athletes that maintain like that or are able to stay in sport into their 40s, which I am, I think it's like you're always jumping back on the bandwagon, like there's always something knocking you off, right?

> And it's just like 'oh man, I've been traveling this last week and I only got one workout in for a whole week. OK, this run is going to be painful, but I just got to get out there.' So, I think it's always jumping back on the bandwagon, no matter how painful it is.

While many of the athletes created routines around other priorities in life, some actually went as far as prioritizing their training schedule and building their day-to-day routine around their sport participation. For instance, Lauren said she stopped doing certain things in her day-to-day life to train more:

> When I was doing my Masters [swim] program, instead of stopping working out and going to swimming and stuff on the weekends, I quit two boards that I was on, so I prioritized sport over like volunteering in the community which may sound terrible, but I just had to.

Lauren also discussed how chores and day-to-day tasks took a backseat to sport:

> If you were to look around my kitchen and living room, it looks like a bomb went off in here, but I always choose sport over other little things that to me don't really matter. I think there's a lot of people that put sport like fourth on their priority list. Mine is like family, sport, and then work, unless work's an emergency … like there's times it's embarrassing. There are times where people will come over and my dishes are still in the sink from supper last night and it's noon the next day, and I just came back from a two-hour bike ride but it's just a priority, so something has to give, right?

MAs also spoke to how having sport as a central feature in their lives could influence their behaviours in other contexts. For example, Amanda described that her participation in canoeing and kayaking helped organize other aspects of her life:

> I find [sport] helps me keep a routine because for me the training is the carrot that gets dangled. I'm driven by that. I'm not particularly driven to go to bed on time, right? But if I just had a hard training session and I'm already tired, it's going to make me go to bed or if you know I've got training tomorrow, I know I can't stay up late so it regulates those other healthy habits that I'm not great at regulating on my own … So I'm like here's your routine. You're going to go to the gym, you're going to set some goals. I've always been really driven around sport and so I'm now scheduling that into my day so that I'm like, well, I got to get up because I got to get the kids lunches made and do this and do that and I got to get all those things done so that I can get to the gym by this time so that I can be done by this time. So I know that it helps me sort of keep everything in order.

Setting goals

Another important strategy for adherence used by MAs was creating short- and long-term goals and trying to improve. Having goals helped motivate the MAs to remain consistent in their sport participation. For example, when asked about what has kept him involved in Masters sport, Calvin stated "just that level of goal setting, being able to set goals, and working on a plan to meet those goals." When followed-up about whether he would be able to maintain long-term participation without goal setting, he responded "no, it would be too boring for me, I'm too competitive for that." The athletes also discussed the different types of goals that they set regarding their training and competition.

When setting goals, several athletes discussed how improving sport-specific skills helped them remain motivated. For instance, Calvin worked on his technique in his throws when he first started, "more on technique, so a hammer throw, you know when I first started I was standing and throwing and then you know you work in one spin, and you want to work in two spins." Similarly, Cecilia discussed wanting to improve different aspects of her swimming:

> My goal would be to improve my open water swimming, open water free[style] but I've also been trying to improve my back stroke because I'm not very good at it and for IM (individual medley) that's the only stroke where I feel like people pass me … so I've been trying to work on that.

Amanda noted that she was driven to paddling sports because she thought they were very technical. In these sports she found that skill-based goals were necessary, especially as time goals were difficult to set:

> I tend to focus more on skill than time because time in canoe is a bit funny because it's hard to keep [track of], it's not like track where the conditions are more controlled. You have a lot of wind and water currents, so I don't pay attention so much to times because they don't have a lot of value, but yeah, I definitely do make goals for technique. I tend to drive my paddle a bit too much so one of my goals with technique is to get my paddle out of the water more quickly for sure.

Although many MAs focused on process and technique, the most common type of goal for MAs was improving performance. For Reggie, improving on his previous times in an event was always the main goal, "I'm not looking for a place, you know to be first or second, but I'm looking to improve on my previous performance." Zoey talked about how they were motivated

to maintain their participation by trying to improve, particularly since she didn't start swimming until she was a MA, "I didn't start swimming until I was a Masters athlete, so I didn't swim as a child. Which I have a theory that it keeps me motivated because I'm still improving, right?" Zoey continued by saying that she was more competitive with herself than with others, and is disappointed if she fails to meet time goals or improve in competitions, even if she wins:

> I'm competitive with myself, but I'm not very competitive with other people. Like don't get me wrong, I'm competitive with other people and if you talk to anybody who knows me, they'll say the opposite. But in my head and especially with swimming I'm more disappointed with myself, like for instance, the 50 breast at nationals, I wanted under 40 seconds, and I was like 41 something. I was mad because I wasn't even close, but I ended up winning gold. So, you know, I got a gold medal but to tell you the truth, to me it was a disappointing swim because I didn't go in the time I wanted.

Other athletes discussed how their goals were based on the outcome of their competitions or their performance in comparison to other competitors. When asked about how he was able to adhere to sport, Todd, an open-water swimmer, stated:

> You'll set goals at a training level, and you'll set goals at a race level. And the races that I compete in vary from 500 meters to five kilometers. So, you know, there's different strategies but yes, I always have a goal based on who's involved in the event. At one of the races this year, it was a four-kilometer race. I was a minute ahead of a guy who was 30 seconds ahead of me three weeks before. So, you kind of get that 'OK, my goal is I want to be ahead of them.'

While Todd identified people he wanted to beat in a race, he spoke to the challenges of setting goals in this manner. More specifically, he couldn't be certain of how much the other swimmers were training. However, due to the nature of his sport, he discussed how goals based on other competitors and his placement were the only ones that worked:

> Timing can be challenging because open water races are dependent on weather, and it's dependent on distance, right? They drop the buoys, they theoretically used GPS, but you know maybe the anchor didn't hold, and the buoy drifted over a few hundred meters or in the really long swims you get off course by however far. So, it's always interesting to those people that do have the tech that go 'oh yeah, that race was 200 meters longer this year' so time is a bit relative. So, it's more placing and just how you felt, there's races that I've done that I just didn't feel right, and the time was slow again. You can't rely on time, but the positioning it's like 'yep, that wasn't quite my race' and then there's races you do feel good, and your position will tell you that. And if you can beat some young whipper snappers and you know rub it in a little, it's always a good thing.

While some MAs had preferences for the types of goals they set, others noted that it depended on context. Lydia, a racewalker, also discussed how she switched her type of goal depending on the competition:

> So, when you go to Worlds, I mean if you get a record going to Worlds that's lovely, but it generally doesn't happen because they're usually really high. I mean you're training to a particular goal so that you can position in this and medal, right? I know what it's going to take to medal from a time perspective, so you have to train to hit that, but once you're in the race, you're just racing to position.

> I'm not in a race to get a certain time unless I'm trying to get a record. I think that's the difference between being in a race where I'm competitive with others or others are competitive with me, where doing a certain pace is going to put me in the mix. Whereas, if I'm competing in some of these National events, the competition won't necessarily be there and provincially, it's the same thing right like I know from the start of the gun what the order of finish is going to be like just because of who's there and so then position doesn't matter quite honestly. But like I said, I don't care if I win provincials like it doesn't mean anything but there might be a time goal that I want to achieve right? So, it really just depends on the competition.

Listening to your body

The next strategy that MAs used to adhere to sport was taking care of themselves by listening to their body. Several athletes discussed how they needed to be cognizant of their body's ability. For example, Serena talked about how MAs need to "recognize the aging and what it does to your body," and she compared the demands of being a MA to that of a full-time job:

> Part of the challenge too was to not over train … we're also older athletes, right as Masters like you know in my age, you really have to manage your body and your energy levels, it's also like having a full-time job and all the demands that it takes, so yeah you balance it and you make it work … I mean you need to manage that because I know some people say 'oh, I can't run' because their knees are shot from playing tennis or whatever, so yeah you definitely try to manage things so you can continue doing the things that you love.

Another important aspect for these MAs was to understand that in some instances they could not push themselves to the same extent as they could when they were younger, as reflected by Joan:

> When your body is still able, you're looking for your maximum output. When there's limitations, you know I have a very crappy knee, I just feel like now that performance isn't quite the same goal anymore. I still want to do my best, but I've got a bum knee and I'm 61 and I can't get my heart rate up anymore you know, it's sort of more gentle now.

Likewise, Todd discussed having to manage the aches and pains that come with participation at an older age, "the older you get, the more you have to work with the aches and pains as opposed to pushing through them, so yeah you do accommodate far more."

One way that the MAs accommodated for the 'aches and pains' was by prioritizing rest and recovery to ensure that they would be able to keep participating in sport and be prepared for the next training session or competition. Raymond mentioned how he used to feel guilty if he missed training, however as he got older, he understood that focusing on recovery was now a priority:

> You know as a Masters athlete; I'm noticing I might need to take two days off for example after races if I'm really tired after. I'll take two days off and I don't feel guilty, but I would never do that as a 30-year-old, I would've maybe taken like the next day off, but no way would I have taken two out of just guilt, and now it's like I listen to my body way more … I didn't care when I was in my 30s and 40s because you recover quicker.

Other athletes had a similar feeling regarding rest and recovery. For instance, Lydia described that as she aged, she could understand when upcoming training sessions would not go well, and how she would respond by pushing the workout to another day:

> When I was younger, or even younger Masters athletes are like, 'this is the workout today, so I need to do it today,' or 'if it didn't go well, I'm going to try again tomorrow.' Now I'm kind of like 'OK, I'm not really feeling it today, I'm going to do it tomorrow,' but I don't do it the day that I don't think it's going to go well.

Some MAs learned that they had to start prioritizing rest and recovery or taking training sessions off after they sustained injuries due to overtraining or practicing while fatigued. As Cecilia said:

> I really noticed that for sure in the past five to ten years. My body needs a lot more recovery … I used to run six days a week, like that depleted me so yeah, I also learned that way, you know I couldn't run for it was probably a year because I was just burnt out so now I take a lot more rest and I'm OK with it.

Calvin, who suffered injuries due to training while he was fatigued, described how he learned to prioritize rest:

> When I first started, I didn't [take training off] and then you just end up injury prone. You pull a muscle or you get a rotator cuff impingement like some days even though you want to go you just got to take the break … usually when I'm tired and my muscles are sore and I still try to go out, I usually pull the muscle, so you sort of go 'yeah, OK, I'm just too weak tonight to go' so I just can't make it,

right? Otherwise, this is going to be the end result, I'm just going to be hurt and you know, it's better to miss one practice than three to six.

Another way that athletes adapted to feeling tired or sore was by altering their upcoming training sessions or through doing other activities. Cecilia described how she adjusted her training to compensate for fatigue when her legs got tired from training for triathlons:

> Now I pay more attention to my body … so typically in training for triathlon your legs get tired because you're biking and running … and also I'm a kicker in swimming so my legs get tired, and if I'm feeling my legs are tired I'm not going to do a hard bike or run workout, I'll take it easy like I'll go swimming but maybe instead of doing a lot of kick, I'll do a lot of pull with the pool buoy or instead of running I'll go do some weights or some core exercises or I'll go for a longer walk with the dog instead of exhausting myself even more. Like if you don't listen to your body, then you're just kind of digging yourself into a deeper hole.

Claire talked about alterations based on whether she was in season or out of season:

> Now if my back's sore or if I'm feeling particularly fatigued or something that day I would either change the activity, like in the winter I can more easily change some of the exercises that I do. Like if I decide that I don't want to follow along with the set list of exercises, I will sometimes change up, like if you know, my back's sore I'm not going to do burpees for example. I will do a different activity than that. When it comes to paddling, if I'm training on my own that day, I will probably do a less vigorous workout.

While many MAs adjusted their training due to injuries or fatigue, Zoey actually switched events in an upcoming competition to compensate for an injury:

> Adapting my workouts has been huge, that's why I scratched 100 IM this year at nationals, cause with fly, just my hip and my back, it just undoes everything. So, I haven't been doing fly so that's why I switched my 100 IM to a 400 free.

In addition to being cognizant of what their bodies are capable of, the MAs needed to understand what works best from a training standpoint and how this may have changed as the athletes got older. When asked what she would recommend for other MAs to maintain their participation, Lydia answered:

> If you've been competing for a while recognize that what worked 10 years ago doesn't necessarily work anymore and don't be tied to 'well this is the way I've always done it, so this is the best thing for me.' Still be open to trying different training methodologies and different ways of doing things because your body is different now than it was before, and you just got to recognize that.

Cross-Training

The final personal strategy that athletes used to maintain sport participation was cross-training. Cross-training involved participating in other sports or forms of PA in order to benefit the athlete in their priority sport(s). Joan referred to cross-training as maintenance work, and deemed it necessary to be able to remain active as she got older, which in turn would make her a better athlete:

> I would also encourage people, especially Masters, make sure they're doing maintenance work with their body so that they can continue to be active for their whole lives … like I go to the gym and do a squat, and a dead lift, and a twist and carry. Like you need to do those basic movements so that you don't slip and fall, so that you don't get a broken hip, and so that you can carry on your daily life

without getting yourself injured … like everybody should be doing balance work, hip hinge, squats. Every time I get off the toilet, I think 'OK that's one less day you spend in the old folk's home.' So, it's just like because I go and squat in the gym. I think that's an important piece of life and if it makes you a better athlete, then that's even better.

Similarly, Raymond's cross-training was often composed of yoga, stretching, and pilates to help with his flexibility, which he thought was critical to staying involved in sport:

I've got a few aches, so the strength training and the stretching is critical. I don't do a lot of yoga classes anymore, I used to do lots, but I try and get up at least three to four times a week and just stretch on a mat and stretch for 30 to 45 minutes. The flexibility is as important as what you're putting in your body … at 30 you don't even think about it, but when you get to Masters age, I do Pilates, we do Pilates my wife and I every Wednesday night and I kept telling the other guys at my club like, 'hey, you guys should come and try Pilates, it's great for cyclists,' and you know you see a lot of eyes roll, but the Pilates and the stretching to me is essential if you want to keep racing and be active as a Masters athlete.

Other athletes used cross-training to stay active during their sports' off-season. When the triathlon season came to an end, Cecilia switched focus to other forms of PA that she often wouldn't do while in-season:

I might do something else, like instead of swimming I might go to hot yoga. I'm not really focused on just triathlon training at that time. So, in the off-season, say September to January, I'll still swim because swimming is easy on your body, but I won't be doing hard bikes or hard runs. I'll do other things, I might go to yoga,

> or I might do a spin class. Yeah, I'm not that focused very much, and I walk a lot because we have a dog … I do a little bit of [cross-training] like I guess I would do more weight training in the off-season, like I go to a pretty hardcore gym and go to classes in the off-season, and I'll go to like oxygen yoga and do other things which I don't do when it's triathlon training season.

In a similar fashion, some athletes participated in other sports when out of season. For instance, Raymond described swimming in the offseason when he was a cyclist:

> In terms of the swimming, I love going into the pool in the fall because it's an opportunity to kind of unwind the body. Again, it's non-weight-bearing but it really helps open me up. It's very much the opposite of cycling where you're locked in a position all summer … I do a lot of kick in the winter so you're strengthening your hip flexors and core which is really isolated in road biking, and it's just a great way to sort of allow the body to recover yet maintain that high heart rate and keep the fitness level up.

Similarly, Reggie provided an example of cross training after being sore from an ultra-marathon:

> Swimming and biking are definitely cross-training for running and I find they're very complimentary to running. So this [event] was 54 kilometers of going up and down hills and so the day after, on the Sunday, I was hobbling around pretty good and I took a day off but then I couldn't walk very fast, I probably looked a little funny, anyway, Monday as soon as I went for a bike ride suddenly my legs felt great, or maybe not great, but they weren't sore and hurting and I wasn't walking slow anymore and the same thing with swimming … swimming's very complementary and it helps my running.

Some athletes also noted that cross-training could be used on the rare occasion when they missed their structured training sessions. As Claire described, she would do another form of PA to make up for missed training sessions:

> You can't really train more often like the times are set, so it's not like going to a gym where you can go 12 hours out of the day … so if something conflicts with the time then you don't do the training, so I would sometimes try and do something else, like if I missed that time, then I would be like 'OK, well I'm going to go for a bike ride beforehand or I'm going to go on an extra-long walk,' or you know some other kind of activity to try and make up for that time.

Zoey re-emphasized the importance of cross-training and explained that she got injured because she stopped doing it:

> I was just at physio for this stupid hip thing, and it's because I'm not doing any [cross-training] anymore. Yeah so, I used to do like paddling and core, and I was in the gym three or four times a week, but since COVID I just don't want to go to the gym, like I'd rather swim … it's a problem too because theoretically I know what needs to be done, like I know I need to be going to the gym two or three times a week but I don't care.

In the time between the first interview and her follow-up, Zoey resumed cross-training to help prevent injuries through a club-facilitated CrossFit training program. She noted, "I started cross-training again. I think I'm the only human in the world that goes to CrossFit for injury prevention … but there's people there I know, and I've signed up and I've paid so it's motivating."

Social Factors

In addition to personal strategies, MAs discussed facilitative strategies that involved other social agents or stakeholders which had an influence on their ability to remain in sport. These social agents were: (a) family, (b) teammates and/or friends, and (c) coaches.

Family

MAs had to navigate their family life in a manner that allowed them to participate in Masters sport. Many of the athletes grew up in active households and tried to facilitate this in their own household as they got married and raised their children. For example, when speaking about what helped them adhere to sport, Cecilia talked about her immediate family: "Having an active family that's very active too that do sport … like even my father was very active and my mom goes to the gym too, like that is just the whole family aspect of valuing physical health. I think that plays a big part in sticking with sports."

Similarly, Joan discussed how her family was active, with her husband and son competing in the same sport as her:

> My son was a rower, he went to Canada Summer Games … he rowed up until a few years ago, and my husband rows really recreationally at the same rowing club as me, and my girls don't row but one of them is just one of those outdoor enthusiasts and the other is a triathlete.

She also described how her and her husband tried to influence their children to be active, thus building a sporting culture in their household:

> I think that all the sport that my husband and I have ever done has influenced them and their choices in life. They want to be active, they always wanted to have

> a bike available, they always wanted to have skis sharpened. I mean we've set that as a pretty important kind of culture in our household for sure.

In addition to being from active families, the athletes were reliant on adherence strategies to help them sustain their regular participation in sport. As was described earlier, many athletes created sport/training routines that did not interfere with family life (e.g., lunch, or early mornings). While this was effective, several athletes had to utilize different adherence strategies that directly involved their family to help them create the necessary time to participate. This was often done through *co-participation*, and *negotiating and juggling responsibilities*.

Co-Participation. Many athletes noted the importance of being active with their loved ones. For Claire, she had been participating in Masters sport with her husband since the beginning, "all along the way we've done this together." When asked whether she believes it helped her adhere to Masters sport, she responded:

> It's helped a little bit, you know in the early days when we didn't really know what we were doing in the sport … we honoured that commitment and together we would sort of say, 'well you know if you don't feel like going', I'm not sure you would say guilted each other into it, but it was more like, 'you know you're going to feel better afterwards.' We talked to each other about the benefit of going, 'I'm still going, you can stay here if you want, but I'm going.' And to this day we do that, there will be a few days where you're like 'I just don't feel like it,' and it's like 'fine, don't go, I'm going and I'm leaving in five minutes, are you coming?'

Likewise, when asked about how her family influenced her continued participation in Masters sport, Cecilia stated "my husband also does Masters swimming, and he'll come on some bike

rides and runs with me." When followed up about whether she thinks that him participating in the same sport has helped, she replied:

> Yeah, I think so because he's not pressuring me to do other things. Right, so I'm like 'OK, we're going swimming' … yeah, it's good that again there will be some days where I'm like 'I don't feel like swimming' and then I'll see that he's going so then I'm like 'OK, I'm going to go, great.'

While the previous examples have discussed the importance of co-participation with their spouses, other family members also played important roles. For instance, Calvin was introduced to athletics through his daughters who competed in throwing. As he described, "my daughters were involved in track and field and our youngest daughter was a really good thrower, so I was helping her out, and once I hit 50 [years of age], the weight requirements went down, and I didn't have to throw Olympic-sized weights anymore." Once he started training and competing in track and field, his younger daughter actually started coaching him. When asked about whether having the opportunity to participate with his daughter and be coached by her helped him sustain his participation, he answered:

> Definitely, just the support and tips, and having somebody that had already been through the process from beginner to high-level athlete and then move on to coaching, so just having that background there and just knowing that 'OK, this is what everybody goes through.' Step by step, you know, it's baby steps to begin with until you build up.

Co-participation was not limited to solely training with loved ones in Masters sport. Some participants discussed how they would participate in other forms of PA with their family

while they cross-trained as well. Flexibility training was touched on by Raymond as being essential to maintaining his participation, but also spending time with his wife:

> It's date night buddy, take notes, for your future wife, you need to have date nights and for us, ours is Wednesday night Pilates, and that's obviously at a studio right, so we go to a studio and once in while we'll hit a yoga studio too and do an hour class.

For Lauren, co-participation involved swimming at the same time as her kids:

> We just go to the pool and it fits well with my schedule because my kids are speed swimmers, so they swam early in the morning, so I would just go to the pool with them and then there the Masters swam at the same time, so I would swim with them too … it seems silly but I have to get my kids up for swimming, so if I'm getting them up then it makes me get up for swimming.

When asked if she participated in any sports or activities with her immediate family, Lauren listed a wide range of activities that she did with her kids and said she regularly works out or trains with her husband:

> My kids swimming, that helps keep me in the pool and four out of the five of us golf. My husband and two of my three kids mountain bike so we go quite often together. My husband and I have played ultimate Frisbee together, we used to play for years … we'll run together and cycle together and all the other sports … we usually kind of go at the same time, like he let me know yesterday that he was going this morning, but we don't schedule it.

Negotiating and Juggling Responsibilities. If the athletes' families did not participate in the same activities, the MAs had to identify a different way to try and create the time to

participate in sport. To continue participating in sport, these MAs had to negotiate with their family members. More specifically, family members needed to agree to taking on more day-to-day tasks in order to create the time necessary for training. Joan described her negotiations with her family members when she decided to pursue Masters sport:

> I had to sort of elicit the support of the whole family to take it on because it meant that my husband needed to do more childcare. I sometimes had to be gone over the dinner hour and evenings to train. It was the first time that I decided that I was going to be a bit selfish about taking this on … [the kids] were kind of teenagers and busy with their own activities so it was basically just getting the husband to agree to take on my role when I couldn't be there to drive the kids, to make dinner, to help with the homework, you know it was basically him and the kids understanding that I was going to be gone a little bit more.

Amanda had a similar arrangement with her husband. She negotiated to look after the kids more in the winter to facilitate her husband's sport participation, but expected him to do the same in the summer so she could train:

> [Husband]'s quite into snowboarding recreationally but he loves it, and so it was actually really good for me when he got into it because then I felt like, 'oh, there's my trade off.' I didn't need to feel as guilty or as if I was asking permission like 'is it OK if I train three days a week? Are we good with that?' You know, I often felt like I was negotiating and asking for permission. I'm still going to do it but I was always rushing home and trying to squeeze it in … so then he wanted to be [snowboarding] several days a week through the winter, so then when the spring came when I was to start training again, that negotiation process got a lot easier

> because it was more understanding of like 'oh you want to do this three to four times a week?' and I was like 'yeah, you just did that three to four times a week throughout the winter.' … so almost throughout the winter I would be encouraging him like 'yeah, go snowboarding,' because I knew that there was a certain amount of credit I was building.

Through this system of negotiating and building credit, she was able to ensure that she could regularly train when the paddling season was underway. Furthermore, she believed that this system allowed her to be a more active parent for her children, particularly in the off-season:

> The arrangement that I had with my husband was that during that half of the year that I was in season was that it was kind of mine. I got that and then in the winter he would do more snowboarding and stuff, and so just over the years that I've competed I've developed a habit, and truthfully, I like being able to say to justify myself as a parent to be like 'during these months I dedicate a lot of time to [paddling]' and I still dedicate a lot of time to my kids, but then in the winter I kind of go more into mom mode and I train, but I fit it in when I can.

In addition to negotiating with their spouses, some athletes had to rely on other family members to watch their children as they went to competitions or training. Amanda continued by discussing how sports are very important to her family, so having to get her siblings or mother to watch the kids while she had competitions was understandable for all the involved parties:

> I've got help, like my mom, or my brother and his wife were both national team track athletes and high-performance athletes so to them, it's nothing at all. If I say 'hey, can I leave my kids with you for the day that I'm competing?' they're like 'oh yeah,' like that's a normal thing in our family, 'I have to go compete' is a very

> normal thing to say and do. So, the people around me are like 'oh yeah, of course on Canada Day you have to go compete' so my kids were with their cousins that day, right? So, that's pretty normal, and maybe it's normal because I've always done it and it's normal because they've always done it, so the culture of my family is very much geared towards that.

In a similar fashion, Claire discussed relying on her in-laws (and babysitters) to watch her children while her and her husband had training or competitions:

> Yeah, so we had a baby, right? So, we had this small child and there were some other people at the club who had small children, so there was two things. We had our in-laws who lived close by, so they came and babysat once or twice a week. We also hired babysitters … we often joke about how important it was for us to hire babysitters so that we could take care of ourselves.

The ability to juggle responsibilities was mentioned by many athletes so that they could adhere to sport while still having enough time to work or be with family, Cecilia stated, "I think with any kind of sport you do, you'll need to juggle [responsibilities], or even if it's a hobby you'll need to juggle somewhat … but there's always finding a balance between spending time as a family and just training on your own." As such, time management was critical for athletes when trying to juggle the different priorities in life. Raymond made this abundantly clear:

> Yeah, I put that on myself more than anything, like I want to be home to spend time with my new baby and so in order to do that, you know, how can I most effectively utilize my time to get these workouts done around work. For me, the two most important things are sleep and time management. If you don't have your 'you know what together' in terms of time management don't even bother. Like

> seriously, because everybody's going to hate you and you'll hate yourself …
>
> Trust me, I know more than one couple that's divorced because of triathlon.

One strategy for juggling responsibilities was training at the same time as their loved ones, which was discussed earlier with Lauren. This was a similar situation that Claire and her husband found themselves in:

> For a long time, until they were old enough that they could either stay at home or we would take them to a sport where a parent was not really meant to be involved or even stay to watch. So if we were going to like a hockey practice, they go to their hockey practice, and we would go and do our workout. Like a lot of it worked out to be the same time … I mean if it was a game we always went to the games, but if it was things like practices then we would drop them off and go do something else. I mean we did stay for [some] practices too, but it became a little bit easier to be fully involved [in paddling] when they were older.

While she talked about times where their kids' practices would be at the same time as theirs, Claire also spoke about times where their kids' activities would conflict with training, and how they had to manage said situations:

> The problem was [the kids' training] wasn't [always] at the same time. So they would be first and then we would be afterwards. So in order for us to [participate] over this length of time, my husband and I would sometimes trade off nights, for example, I would go one night, and he would go another night. If our kids had other sports that conflicted timewise too we did a lot of trading off of who trained when, and also there were times when let's say they didn't have something, I would feed them dinner for example and then my husband would go to the club

> and start his workout. I would take the kids down [to the club] after we ate, and then he would come off the water, and I would go on the water, and he would stay and play soccer or something with them and then we'd go home together … there was a fair amount of juggling for probably a 10-year period I would say.

Notably, some of the athletes discussed how they were fortunate to have a partner to help them juggle various responsibilities in life. Cecilia thought juggling responsibilities with her husband was necessary to keep them both involved in Masters sport long-term, where she stated, "I mean it would be very difficult to do something to the amount that I'm involved, as a single parent."

While some MAs had to negotiate with their partners and loved ones, some athletes also discussed how their families allowed them to take the time to participate in sport. For example, Darryl said, "Monday, Wednesday and Friday evenings I have training and my wife knows that, and off I go and come back and sit in a cold bath for a while and have something to eat and that's just my schedule … it is just giving me the time."

Friends and Teammates

Family members were not the only social agents that were relied upon to facilitate regular sport participation. The social aspects of Masters sport proved to be very influential for MAs' adherence. Of note, the comradery with teammates and fellow competitors was particularly important as the athletes were entering Masters sport. Calvin spoke to the importance of interacting with other throwers:

> What encouraged me to get into it is when I go to a meet and my daughter was throwing and then the Masters would be there and so you get talking and you get to know them. It's a small group, right? You get to know them, and they're sort of

> encouraging too, you sort of understand their story of how they got there. It sort of takes the edge off or it's more welcoming, right? It's not as scary when you're going out there, you know they mess up too, they throw it into the cage, and they're not always performing at their best.

Meanwhile, Reggie spoke about how tight knit the running community was:

> I'm not a nationally or provincially ranked athlete but in the circles that I hang with, like the ultra-runners, it's amazing the kind of people that you meet and for me that is something that I think kept me in this sport … it's just a pleasant experience, like I was telling somebody earlier, I used to play basketball and the people were ultra-competitive and just the atmosphere in the gym was toxic and not good. When I got into this running, swimming, and cycling, just the environment of the folk there, the running people are the best folk. It's just they're very supportive and it's not a real crazy competitive thing, it's not like 'I'm going to beat you in this race', it's like 'hey, you're running in this race and that's awesome and we'll see you out there.' … and just that idea of 'I've got my own goals and you've got your own goals and I love your goals.'

When speaking of the comradery within Masters sport, Darryl also spoke about how he was inspired by the other competitors in track and field:

> I mean I just really remember enjoying the track community and going to a track meet and the whole vibe around it. You know, having all these athletes warming up and training and competing at all these different events. I find it pretty inspiring, and I really like it.

On a similar note, MAs spoke about the importance of immersing themselves within the Masters community. As Todd noted:

> Try and get involved in the greater community. So don't just limit yourself to one or two [sports], especially if it's a team sport, you're kind of into that just as a matter of course. But if it's an individual sport, try and get involved with the community and again it's going to come down to the people in that community and if you relate to them or whatever then you've got, from my perspective, a great chance of success of maintaining [participation].

Training partners. While the comradery in Masters sport helped the participants adhere, they also relied on several strategies that involved their friends or teammates. Many MAs discussed how they regularly trained with other members of their clubs, or with their friends, and how they felt this helped them adhere to sport as it kept them accountable to somebody. As Todd, who was recruited in Masters swimming by a co-worker described:

> Look for the people that can help motivate and encourage you to keep going. That's a huge part of my activities is since I started swimming I have always, not every single day – sometimes people can't make it, but I have always swam with someone. Right now, the group is down to two but at least there's still somebody there, right? If you don't show up, they notice and then you hear about it.

Joan spoke further about the importance of training with others:

> The social part is very big for me … when you have somebody that's doing the same thing as you and then there's always a social part after that, you know, going for coffee or just the chats about the hockey game when you're putting your

> blades down, and it's just nice to know that you're meeting someone else and they're expecting you. That's definitely a big part of the participation for me.

Joan also discussed how getting coffee after training was an essential part of training with her friends, "what's the saying? Rowing is optional, coffee is mandatory."

While participating with friends was seen as encouraging and helpful, Cecilia talked about how her friends would often do different forms of PA as their way of hanging out:

> The group of friends that people hangout with have a huge impact on staying in sport, like all my friends are athletes in something so when we meet up, we'll meet up for a workout or after a workout. It typically revolves around workouts in some way … and then if you invite them to do something like 'let's grab coffee and go for a walk' that you know they're probably going to be interested in wanting to do it … and a lot of times that run or that bike ride is our social time.

Training with teammates provided additional benefits for MAs as well. For instance, training with a partner helped Calvin make sure he didn't throw too quickly:

> It's nice having a partner and knowing that [teammate]'s always going to be there. I mean because when you're here all by yourself, you throw too quickly. You know you just throw, throw, throw and there's no break and then when you get to a competition and there's 16 guys, well now you got a 20-minute break between throws, so it's a different strategy.

Another benefit of training with others was the ability to learn different techniques or skills from other athletes. This was the case for Serena:

> Sometimes it's just like 'how do you do that?', like you know other athletes will just reach out and help you or a lot of times people just say 'hey, come in the boat

with me'. You know and they just kind of reach out and we will do that with some of the newer paddlers like someone might be there and they're kind of like looking around and he was like 'come in the boat with me' and 'here, we'll do it this way' and it's just kind of organic and then you learn things from other people … sometimes someone just says something in a boat and you're like 'hey, that makes really good sense', or 'how did I not think of that', or they'll say 'this works for me, try it this way.'

MAs also discussed how enlisting training partners enhanced their feelings of accountability. This was the case for Sherry who felt that running with a group of friends was encouraging, but also felt it kept them accountable as she thought running in a group was important from a safety perspective:

> We plan runs together and we just kind of pick a day and we'll be like 'oh should we go for a run?' and when I don't have work or when they don't have work we try to plan it. My running partner, she's kind of the main person that I run with, but I always invite other girls that I know. I try to invite them as much as I can just to get a big group together. It's just more fun running with lots of people rather than one or two of you. It's just when you get a whole group together and you enjoy it together and they totally influence me too. They encourage me to run as much as I encourage them too so that's awesome … When you're committed you don't want to let them down, they want to go out for their run and you know if we're going out and doing a [trail] run, it's really not safe to go out by yourself in the middle of the summer, there's rattlesnakes and whatever so you could get hurt, you could roll and ankle and in a lot of places in the [trail] you don't get

> [cellular] service so if she wants to go out for a run and I commit to it the day before, and I don't feel like doing it the next day because I'm just kind of low energy and just not feeling up to it then yeah, it's in the back of my mind like 'she can't go and do it by herself, she's relying on me to be there.' So yeah it totally keeps me accountable.

Friends and teammates were also important from a motivational perspective. Todd described the support he received:

> There's definitely a sort of comradery and a motivation within the group … they're all great people and motivational and supportive and so on and so forth. So, you know I always look forward to either training with them or doing some event or competition with them, so it's good motivation. I mean ultimate motivation has to come from within, but the support around you is a huge part of enjoyment, and enjoyment is fundamental to sustain something.

Similarly, when asked to summarize what kept her in Masters sport, Lydia responded, "it will vary from person to person but find your peeps, like you've got to have someone in your corner like whether it's a coach, whether it's people you train with, it's really hard to do it by yourself, I think that's really hard. You got to have a community, it can be really small, it can be one person, but I think that's really important."

Social media and virtual training. While support and encouragement were primarily received in-person through the athletes' friends and teammates, some of the athletes resorted to online strategies to keep them invested in Masters sport**.** Online strategies included the use of social media and virtual training on platforms such as Zwift. Social media was relied upon by the athletes in terms of communication, motivation, and getting information about different

workouts. From a communication perspective, Reggie was part of a Facebook group which helped him stay connected to other runners and to plan for events:

> Creating groups on Facebook is very much like a club, and maybe even better than a club and you don't have to pay, but you do get a whole lot of social banter about races and about doing different things and there is some of that pressure, 'hey, do you want to do this race? Why don't we train for this race' and there's a little bit of that and we share training tips and that kind of thing. So, it's not an official club, but it functions a whole lot like one … it's nice, we put out every week on our Facebook messenger group, 'hey, what are we doing this week?', 'How far are we running?' or whatever, it's posted on there.

While he used social media to coordinate training and events with other runners, some used it as a way to find information regarding workouts and equipment. Joan used social media to find different ways to enhance or change her training, "I do like to follow a lot of people who do like fitness and weight training, or you know things that you would do in the gym. I love watching that stuff and that gives me motivation to try different things in the gym." Getting information about workouts was also important for Zoey, who was in a WhatsApp group chat with other open water swimmers:

> The information within that WhatsApp group was huge, just like training wise, equipment wise, all that kind of stuff. I'll also google workouts right now and I always have. So like for this 200 breast, I've been doing a lot more breaststroke sets when I go by myself so I'll just look it up and figure it out and I'll always do that in the summer for open water, just with my own workouts because at those

> times I'm swimming eight kilometers which takes two and a half hours so you can't swim with the club.

Zoey was also motivated when other athletes would post in the group chat after they finished training, particularly when she was preparing for a long open water swim:

> I was in a WhatsApp group with some people I met at a training camp and like I don't know if I would've swam the lake without them because when you train for huge swims, you do Saturday and Sunday like six or eight hours both days and like you get really worn down, right? Like I can count a number of times I'd look at my phone in the morning and they were in England, so they were like five hours ahead, so they'd often be out of the water by the time I was getting in and it'd be like 'oh the sea was crap today but I did eight hours' and I'd be like 'oh, I better go do eight hours too' so I found that really motivating.

Similarly, Lauren described her use of apps and online training platforms:

> Well, I would say Strava is like the gamification of that, where you know you give kudos to other people, and you wake up in the morning and you can see five people did a run yesterday. It's really motivating. The same thing with Zwift. Like when I'm on my bike on Zwift and you see people going by you, it's really motivating … using some kind of a gamification app because when you have a schedule and you get busy with work, it's easy to let things drop off and if you have that app that's telling you that everybody else is [training], even though you're busy working, it motivates you.

Cecilia also enjoyed the ability to 'meet' with her friends on Zwift and use it as a space to both interact and train with one another, "sometimes my friends will say 'hey let's meet up on

Zwift' like you can meet your friends, and then we're going to go for a bike ride together." While Zwift was used as a way to stay connected with other athletes and train with them, it was also relied upon to increase the athletes' training. Raymond found that Zwift was a 'game changer' for training:

> Zwift's pretty much taken over the game, I've got a smart trainer that you hook up to Zwift online and you're all of a sudden in a forum with people from all over the world and you can ride courses and there are lots of races you can enter online … it's been an absolute game changer because you know for example we have a boys trip in the spring and we used to show up there and guys would be quite unfit and it'd be an opportunity to kind of kick off the season and try to do some climbing and get more fit, but now because of Zwift guys are riding all winter. I used to get on the trainer once per week and now guys are riding like four or five times per week and it's crazy.

Cecilia used Zwift to make sure she trained harder and completed different types of cycling workouts to prepare her for upcoming triathlons:

> I mostly do Zwift because the workouts are varied and like you can pick, and also I like the scenery like you can choose different countries. You can choose based on elevation or distance or time and I find it quite challenging as opposed to just biking and switching gears to make it harder, but because I have a compu-trainer it changes when I'm going up a hill and I have to stand-up. I use it just for the challenging aspects of the program and I've also used it a handful of times for running on the treadmill just to give some variation in my workout as opposed to doing the same kind of manual workout every time or the same interval workout

> every time … I find with Zwift that I tend to stay on the machines longer than if I were just sitting there or just running without watching anything or following a workout.

Coach

In addition to teammates and friends, MAs often relied upon their coaches to make sure that they completed their workouts and were prepared for competitions. While the MAs didn't create any strategies that involved their coach, their coaches played a major role when it came to *scheduling and tracking*. For those MAs who had coaches, they described how they provided them with regimented training programs which gave them something to work towards in the build-up to an event. For example, Reggie hired a coach to help focus his training as he began participating in longer distance running events, "I did some half marathons, but when I wanted to get into some longer distances I got a coach, and I had a friend who got into coaching running and I guess I engaged him as a coach." Joan also hired a coach to make sure her workouts were scheduled in a way that would have her ready for the regattas she wanted to compete in:

> I have a meeting with her once during the year. We sort of set out what the plan is going to look like, which regattas I want to aim for, and she would set the program up accordingly … so getting close to regattas, getting close to an actual race, we would do a little bit more starts, a little bit more sprinting just to prepare for those events.

While having the coach helped her regularly train and work on different skills and strategies leading into competitions, Joan also stated that it ensured she didn't train too hard:

> I think one of the things that our Masters athletes are bad at is they work too hard all the time. So having a coach or coached program just makes you row easy on

> your easy days because they're actually giving you a guideline to follow and then you can work hard around the hard days.

When the athletes were using coached programs to schedule their training sessions, they were often required to record their workouts so their coach could see how they were progressing. This was often done using various online programs or applications (e.g., Training Peaks or Microsoft Excel). For example, Reggie used an Excel spreadsheet to keep track of his training sessions and his coach would then use this information to alter upcoming workouts:

> So initially he created the Excel worksheet with days of the week and specific days so on April 20th you're going to be doing this … after the end of the session I would have to go in and say how far I went, what my average heart rate was, what elevation I ran, and how I felt at the end. At the end of the week, he'd go through and take a look at the activities and tweak some.

Several of the athletes noted how they enjoyed being coached and logging their workouts as they felt it held them accountable to regularly train. Lydia stated, "when a coach gives you workouts, you're more accountable. When I create my own workouts, not so much. I just wasn't really getting anywhere and so I needed some accountability and that's just exactly what I needed." This was similar to Reggie who also felt that the accountability from his coach helped:

> For me that was really valuable because part of it was that you're accountable with somebody and so you know somebody's going to be looking at your data and so you want to make sure you're following the plan that they set out … so it was great to have somebody giving me some expert advice on what I was doing.

An additional aspect of recording workouts for their coach online was the ability for them to leave comments or feedback for their athletes, as discussed by Raymond:

> What I really like is in Training Peaks you can make comments for every workout and then [coach] sees the comments and then he will respond in there or he'll just simply say 'good workout, your numbers look great, keep at it,' stuff like that which you know, encouragement helps. I don't care what age you are, getting encouragement really, really helps motivate you.

In addition to being held accountable, another way coaches helped MAs was by giving feedback in training. Interestingly, the MAs stated that to get feedback from coaches, it was important to ask for it. As Cecilia stated:

> Typically, because a lot of the Masters swimmers were or still are competitive swimmers, they don't necessarily need tips, but I have made a point of asking the coaches 'help me with backstroke, what am I doing wrong here?' and just being very specific and asking for help.

Similarly, Amanda described how her coaches were younger adults and that she needed to explicitly tell them that she wanted feedback:

> The coaches are often young like 18, 19, 20, so I think sometimes the coaches don't feel like they can offer advice. So, my strategy is that I do want to be coached, I like to get better so I will ask them. [The coaches] seem to change from year-to-year but I will always let them know that I want coaching so that they feel welcome to give it because I think sometimes it's a bit tricky when you have a young coach and then an athlete who could be their parents' age, they don't know how to handle it … I'm always really clear, I want to get better because it's a very technical sport and you do need that feedback if you're interested in getting better.

Environmental and Contextual Factors

While personal strategies and social agents helped the MAs adhere, there were also other external factors that were impactful. Environmental and contextual factors refer to various aspects that influence a MAs' adherence to sport that were external to the adherence strategies that the MAs athletes used, but often influenced the use and creation of these strategies. There were three different external factors: *work and employment status*, *proximity to training facilities*, and *prior experience as an athlete*.

Work and Employment Status

The athletes' job and employment status greatly influenced their ability to maintain regular sport participation. As was discussed earlier, many of the athletes created routines and selected sports around what best fit their work schedules. However, a lot of the athletes talked about ways that their jobs allowed them to sustain their participation in Masters sport. Raymond spoke to how his employment status influenced his ability to adhere to sport:

> I'm very fortunate that I own my own business, so I can dictate my own hours somewhat and I typically don't even work a 40-hour week, I probably tend to work a 30-hour week. So, it allows me the time to pursue my activities. If I was working for the big man, 50 or 60 hours a week I certainly wouldn't be in as good of shape as I am … and I will be honest, it allows me to buy expensive road bikes, they aren't cheap.

Even the MAs who weren't self-employed had jobs that provided them with the flexibility to train during the day or to leave when they wanted to pursue sport. This was evidenced by Todd who spoke to the flexibility he had at work:

> [My job] allowed me to take the lunch hour break, and we would try and leave 15 minutes before, and we'd actually arrive 15 minutes after which was great because I sort of had that flexibility in my role. That's where the 'you stay until the work gets done' comes in. So, you're not always finished at five or six or whatever. Now I sort of have that same flexibility, but we swim in the morning, so I'm back home before eight and just start my day and work through it.

Reggie, who as a teacher, had opportunities to train during the workday as long as it didn't interfere with his teaching schedule:

> I guess it's flexible … here at the [school] my schedule is quite a bit more flexible, so I teach 18 hours a week and so divide that by five, you're like three or four hours a day of teaching. So typically, there's an hour, hour and a half where you can get out and do something, go for a bike ride or whatever. We're supposed to put in a certain number of office hours and be available for institutional service and that kind of thing, but you know if I go for an hour and half bike ride instead of just an hour, then I just go home half an hour later, administration is flexible. This [school] is excellent for support, for having a flexible schedule that supports that kind of thing.

While having flexibility in their job was an important factor for some, Serena thought that a consistent job where the hours were fairly set in stone was also very influential in maintaining participation, "I think of someone who works shift work, it's going to be challenging, right? So, I think just having a very traditional, balanced work schedule assists with that, like it's routine and structure that helps."

Other athletes had the opportunity to stay active through their jobs, which some athletes thought was beneficial. For instance, Sherry worked as a trainer and taught fitness classes which helped her stay fit, particularly as she only trained for long-distance running for eight months of the year:

> I don't do any running during the cold months, I'll run on the track or treadmill but not too often … February is usually when I kind of start to run, first competition is in March, so I like to prepare a bit for that but sometimes I don't start right until March, until a couple weeks before that race just because I'm still doing my fitness classes so I'm still in decent shape … if I'm working and I have a class with say seven or eight people who have been doing my class for a few years then I'm working out with them because I think it motivates them to try to keep up to me, and so then it pushes them harder in the class, right? It just kind of depends, but for the most part I work out with them.

While teaching fitness classes, Sherry claimed that she felt like a role model for the people who took her class, which in turn motivated her to remain involved in sport:

> I guess the people in my class motivate me. I feel like I need to be a role model, I need to be somebody that they can kind of look up to that will make them feel like they can go out and they can do this, because if I can do it, anybody can, right? And like the girls in my class, I don't want to disappoint them, I want them to see that anything is possible, that they can work hard and go out and they could do any distance that they wanted to as long as they trained properly for it. I guess that would help me with my running, they kind of just motivate me to run.

Amanda, a physical education teacher, mentioned how she was provided with both the time and equipment required for her to train at work:

> I try to get something in on my lunch or my prep and I try to get really efficient with my workouts. I'll try to do like a high intensity functional training so I can do like 20 or 30 minutes but I'm really working hard because I need to be efficient with it … that's the kind of thing I would do at work, I would set up a little thing and we've got great equipment at my school, so I'll get a couple kettlebells and I'll just set up a circuit and I'll just do that at lunch or something … Let's say I'm teaching the class right before lunch and I'm already in the weight room, I'll already have it set up as my students are leaving so as soon as they leave, I lock the room and I start immediately so then I have the time to go and eat afterwards and get ready for my next afternoon class.

She also spoke about how she often got to be 'passively active' during the classes she taught in addition to the workouts she would do at work and her structured training in the evenings:

> I'm sort of passively active during class because they were short a player, so I played some soccer or I'm trying to motivate my class during a fitness class, so I jump in. I teach a lot of the weight room fitness classes and sometimes I use shame as a strong motivator with teenage boys because if you're a middle-aged woman who can do more push-ups than them it generally gets them going. So, what I'll do often is if we're doing a workout and it starts to lack energy, I will shift gears and join people at a station so I'm passively lifting weights and moving a lot more than most people during the day … I know that every day that I'm at

work I'm getting some activity in, so I'm ahead of the game, I'm ahead of most other people.

Proximity to training facilities

The next environmental and contextual factor that influenced the MAs' adherence was how close they lived to their respective training facilities. Many athletes lived close to their clubs that they would often bike to training. Claire reported that it was a seven-minute bike ride from her house to the club. Similarly, Joan also rode her bike to training in the mornings, where she stated that she could "get to the rowing club on my bike in about 12 minutes," which was a similar amount of time that it took Serena to get to the club by walking or biking. When speaking about where she trains for racewalking, Lydia said, "I live right by this provincial park and so I spend a lot of time in there, or I go around the neighborhood. But yeah, I've got lots of bike pathways right at my fingertips, so that's generally where I go." She further elaborated, "… if I had to travel a lot further, it wouldn't happen, I just don't have the time with work."

Darryl felt that his proximity to the club was helpful because he spent less time commuting, "it's time away from commuting, it just makes it quick to get there." Spending less time commuting was something that Serena also mentioned:

> I think because it's ease of access. Like sometimes you're running late and it's like 'Oh I only have 15 minutes to get down there,' but yeah, it's ease of access and just that mental calm like 'I don't have to worry about traffic' because I won't miss practice because I'm in traffic or something happened, or my car broke down because I can walk there.

Joan went as far as choosing her house based on its proximity to her club. She said, "I mean our house is close the river generally, so being by the river valley was an important decision to live

where we live." She was then asked if her proximity influenced her participation in the sport, to which she countered, "Yeah, I would say it's the other way. My participation influenced my proximity."

Whilst Joan bought a house based on its proximity to her training, Claire discussed being reluctant to move because she currently lived near her club:

> We've talked about moving, and I think about other people who live at a distance from the club. You know it's very easy for me to get there and I know that if I was further away, I am certain it would have an impact on my participation … I have thought about it already, if I were to move away what kind of an impact that would have on [my participation].

Prior experience as an athlete

Another aspect that impacted the MAs' ability to sustain regular involvement in sport was their prior athletic experience. The majority of the athletes in this study (12 of 14) had reported being involved in organized sport when they were younger. Furthermore, many competed in sports that they used to participate in when they were younger. For example, Darryl competed in sprints in track and field in high school and started competing in the same events in his sixties:

> I used to run 400-meter races in high school, and it was really competitive, kind of at a national level so it was something I always kind of liked to do … and if you find something that you love doing, you're going to enjoy it. It's not going to be some sort of torture.

The athletes noted that their previous experience was beneficial as it allowed them to understand the demands of being involved in sport at an older age. This was particularly important to Joan, who compared herself to other Masters at her club:

> I really like high performance and pushing at certain workouts to get the training benefits. I like that kind of work and so I think that having a history with that and enjoying it makes it easier to train now for a high-level performance. It is physically hard work and it's not always comfortable. So, someone who would come into a sport at our age new and doesn't understand the feeling of that or the importance of that, they don't want to be uncomfortable. They would not want to participate the same way as I do. I see that very much in my own club where we have sort of a competitive Masters group and then there's a whole bunch of other people who row, and who never want to get their heart rate up ever, they just want to paddle out there.

She then went on to discuss how her past experiences in rowing were helpful, as newer rowers struggled with certain strategical or technical aspects of the sport:

> I think even in racing, the whole processes around racing, if you've ever done it, it is a lot. It would be scary for someone who's never ever raced before. I mean you got to row up by yourself to the start. You got to figure out how to get out of the starting block. You got to know how to have a racing strategy. It's not just starting at the beginning and finishing at the end, there's a lot of prep.

Understanding the strategy of a sport and how to effectively train was something that Cecilia also learned over her career as a long-distance runner:

> It's the discipline [that you learn] because it's something you need. You can't just run, I call them junk miles, but you can't just run and think you're going to do well. You actually have to do speed work, it's good if you can do hills and to build up strength. I think that knowing that part of it has helped me stick with triathlon too because you know, I can't just go out and swim open water thinking I'm going to do well, like I know I have to practice more.

She further elaborated on how her past as a runner also helped teach her the importance of committing to sport, "I bet you I've been running for over 30 years or so. I would say my competition in running definitely made me realize that it's good to be in shape, to compete, and learn and stick to something."

While many of the athletes had a history in the sports that they were competing in, several were competing in newer sports but felt like their history as an athlete was still helpful. This was the case for Zoey who said, "I was a gymnast when I was really young so I think that might play a part in it a little bit, because I trained like 20 hours a week." Afterwards, she was asked why she felt her previous experience in sport helped, she replied:

> Probably just because it becomes a lifestyle. It's part of my lifestyle and I felt lost through university when I wasn't part of an organized sport and club, and I didn't have that kind of athletic outlet … So, I think growing up with [sport] just allows that expectation and my lifestyle choices to fall into that.

Chapter 5: Discussion

The purpose of this study was to understand the different strategies that MAs employed to help them adhere to sport throughout middle and late adulthood. Results indicated that MAs relied on personal adherence strategies and strategies involving other social agents and stake holders to remain active in sport. Additionally, there were other environmental and contextual factors that influenced their ability to create strategies, and ultimately adhere to sport.

Adherence Strategies and MAs

It is important to note that the MAs constructed (or lived within) privileged social environments, where they were provided with the opportunity to utilize various self-regulatory strategies in such a way that fostered their ability to sustain their regular involvement in Masters sport, and regular PA. Aspects of their environment that certainly helped them self-regulate included flexible jobs, supportive partners and family members, and living close to training facilities. All of these factors contributed to their ability to self-regulate their participation by providing them with adequate time and resources for them to be effortful in their participation and competition.

Within their privileged environments, MAs were required to employ several self-regulatory strategies to help them sustain their participation in Masters sport. These strategies include *goal setting*, *scheduling and tracking* workouts, and *creating routines*. These findings are consistent with the Masters sport literature (Appleby & Dieffenbach, 2016; Barrell et al., 1989; Goodsell & Harris, 2011; Makepeace et al., 2021; Stevenson, 2002) that has highlighted MAs use of self-regulatory behaviours for performance and sustained participation. They also support results from the exercise psychology literature that show benefits of self-regulatory behaviours for PA adherence in adolescents (e.g., Hortz & Petosa, 2008; Shimon & Petlichkoff, 2009),

adults (e.g., Anderson et al., 2006; Stadler et al., 2009), and older adults (e.g., Umsttatd et al., 2006, 2008). Together, these suggest that common self-regulatory strategies exist that enhance the likelihood of remaining physically active as one ages.

Although I identified similar self-regulatory behaviours to previous work, my results provide new information on how MAs regulated their behaviours and what influenced them. When setting goals, MAs focused on improvement of certain techniques or past performances, while others were focused on the outcomes of their competitions (e.g., winning, placement, setting records). When scheduling and tracking workouts, MAs used common software (i.e, Microsoft Excel) or apps (i.e., Outlook Calendar) to plan and assess their training. When creating routines, MAs spoke about balancing sport, and family and work demands (Appleby & Dieffenbach, 2016; Barrell et al., 1989; Dionigi et al., 2013; Makepeace et al., 2021) by working out in the morning, before work, or during lunch hour. Alternatively, some MAs started with scheduling their sport participation, and had the privilege to build the rest of their routines outside of sport around their training and competition.

My results also offer more novel strategies used by MAs. For instance, MAs were meticulous in choosing sports that would favour their adherence. They chose sports that they had past experience in, worked in their schedules, and provided opportunities for improvement. Similar to previous research (Dionigi et al., 2013a; Langley & Knight, 1999; Rathwell & Young, 2015; Stenner et al., 2016), MAs favoured sports that their bodies' were capable of doing. However, a novel finding was the idea of switching sports based on their schedules to ensure their PA fit into their day-to-day life.

The athletes also discussed *registering for events* or competitions as a way to stay motivated to train and compete. To date, only a small number of studies have discussed the effect

of registering for events on participation in Masters sport (Dionigi et al., 2011; Huebner et al., 2021). Some studies show competitions motivate MAs because it provides them opportunity to travel (Dionigi et al., 2011; Hritz & Ramos, 2008; Rathwell & Young, 2015). In the current study, registering for competitions was important for MAs, especially those who did not compete in a club, because it ensured they were in peak condition for their events (i.e., they did not want to embarrass themselves in front of other competitors). MAs, and their coaches, also used competitions to help structure their training schedule throughout the season. Together, these findings speak to the importance of competition for MAs as it provides them with a goal to structure their training and showcase their abilities.

Interestingly, the influence of competition on motivation has received little attention in the Masters context. Instead, most research within Masters sport focused on more self-determined motives (Dionigi, 2005; Dionigi et al., 2011; Phoenix & Griffin, 2013) or motives related to the physical or social benefits of sport (Dionigi et al., 2011; Stevenson, 2002; Walsh et al., 2018; Young et al., 2015). While the abovementioned motives are important to MAs' PA adherence, my findings suggest MAs' competitive orientation may be more central to adherence than previously thought. For instance, the current MAs registered for events to structure their training and prioritized rest and recovery so that they peaked at their competition. Competition was even woven into MAs' rationale for choosing their sport. MAs were deliberate in choosing sports they could win, or ones that they could be competitive with themselves in and improve in over time. Finally, with the aim of being competitive, the athletes also set specific outcome goals for competitions. Taken together, these findings suggest that it may be especially important for MAs to tie competition to sport adoption and adherence strategies throughout adulthood.

When discussing how they remained physically ready for training and competition, MAs spoke about deliberate recovery strategies. Of importance, MAs often exceed PA recommendations through their participation in sport and sport-related training (Deck et al., 2021; Weir et al., 2002; Young & Medic, 2011a), and while these levels of sport participation help MAs achieve health benefits and prepare for competition, they may place MAs at a greater risk for sustaining injuries (McKean et al., 2006; Moreira et al., 2015; Patelia et al., 2019), particularly those caused by overuse or overtraining (McKean et al., 2006). In this study, MAs listened to their bodies and cross-trained outside of normal practice times or in the off-season to ensure remain physically fit and avoid injuries over time.

While there is limited research on recovery in MAs, some of the current strategies regarding rest and recovery have been shown to optimize performance and participation in the short- and long-term in younger elite populations (Wilson & Young, 2023). Wilson and Young likened recovery to a process of 'absorbing and preparing', where the goal was to absorb previous training to prepare for the next sessions. Continued cycles of absorbing and preparing were described to lead to sustained training and increased capacity for future training sessions. Wilson and Young also found that elite athletes employed a process of 'breaking and engaging' where they stopped participating in strenuous training and participated in other easier forms of training (i.e., cross-training), which was often done through participating in different activities. Interestingly, while Wilson and Young (2023) found similar recovery strategies in younger elite athletes, their study focused on performance.

In my study, MAs intentionally used parallel strategies to adhere to sport across their lifespan. More specifically, they prioritized rest and recovery to ensure that they would be ready for the next training session and could maintain a high training load as they aged. Given the

similarities in recovery strategies between MAs and elite athletes, further research is needed to explicitly understand the utility of performance enhancement/maintenance strategies as a tool for also enhancing long-term participation. In fact, many of the findings related to adherence (e.g., adapting training, prioritizing recovery, selecting/changing sports) can also be related to the concept of sustained performance.

Sustained performance been studied in the Masters context (e.g., Baker et al., 2007; Dionigi et al., 2013; Rathwell & Young, 2015; Schorer & Bakers, 2009) and is commonly explored through the conceptual lens of the Model of Selective Optimization with Compensation (MSOC; Baltes & Baltes, 1990). Selection involves reducing high efficacy goals to focus more specifically on others, optimization occurs by increasing focus on specific behaviours or movements in training, and compensation happens by focusing on improvement of a skill to compensate for a decline in another skill/aspect (Baltes & Baltes, 1990). Rathwell and Young (2015) noted that selection may come down to picking sports that provide athletes with their best chance for competition and by limiting their number of auxiliary activities during the season. Further, they found that the runner they studied would participate in other forms of training if they were sore, which Rathwell and Young (2015) attributed to the optimization aspect of sustaining performance. From a compensation standpoint, other studies found athletes adapt their techniques or strategies to help offset their physical losses while in competition (Baker et al., 2007; Schorer & Baker, 2009).

The MAs also discussed changing sports according to their physical capabilities and altering techniques/training based on their abilities and prior experiences to compensate for age-related declines (Baker et al., 2007; Dionigi et al., 2013; Rathwell & Young, 2015; Schorer & Baker, 2009). Further, the athletes noted that as they gained more experience in their sports that

they could adjust their training to make it easier on their body and allow them to maintain their involvement throughout adulthood. What is important to take home from these combined results is the idea that maintaining performance as one ages may be important to MAs' adherence as they navigate sport through middle- and late-adulthood.

Social Agents and MAs' Adherence

MAs relied on multiple stakeholders or social agents to help them adhere, with family members being one of the most important. When discussing family, MAs described how they engaged in purposeful negotiations with their spouses or loved ones (Appleby & Dieffenbach, 2016; Dionigi et al., 2012; Makepeace et al., 2021) to ensure that they had adequate time to participate in sport. Other MAs had to be open to communicating and making compromises in order for them to train (Dionigi et al., 2012). For example, one participant in the study discussed having to train at a different time than her husband, despite participating in the same sport together due to their children's extra-curricular activities. Based off my findings, MAs' ability to adhere to training and competition appears to be heavily dependent on whether they can manage their responsibilities in life, which often involves a reliance on their spouses to help manage the day-to-day tasks.

While navigating family responsibilities was important for many of the athletes to maintain their participation in Masters sport, it was discussed more frequently by the female athletes than it was for the male athletes. For instance, the female MAs discussed having to negotiate or manage day-to-day responsibilities more often, whereas some of the male athletes simply mentioned how their families understood that they had to go to training in the evenings. This was noted by Barrell and colleagues (1989) who found that male athletes more likely to

‘take time’ (i.e., organize life around training) and female athletes were more likely to ‘share time’ (i.e., combine family time and training or share household responsibilities).

Some of the athletes in this study also spoke about having to manage their familial priorities with their responsibilities to themselves as an athlete. For instance, one athlete noted how she often had to balance the time she spent as a mother with the time she spent as an athlete in preparation for competition, and how she relied on her husband and other family members to help take care of her children (and other priorities) during her season and could be more present for her family when she was out of season. These results affirm that female athletes often have to resist and conform to traditional stereotypes and create a multidimensional identity of their self as a mother and an athlete to participate in sport (Appleby & Fisher, 2009).

Another strategy that MAs employed to help navigate familial roles was to train with family members in Masters sport and/or their auxiliary activities for cross-training (Barrell et al., 1989; Dionigi et al., 2012; Makepeace et al., 2021). In a Masters sport setting, MacDonald and colleagues (2009) found that the spouses of MAs had significantly higher levels of exercise than the spouses of sedentary older adults, which also shows how MAs’ participation may also (in)directly benefit activity levels of their spouses. Other studies have found that co-participation with loved ones increased PA participation in younger ultra-marathon runners (Malchrowicz-Mosko & Waskiewicz, 2020), recreational exercisers (Wallace et al., 1995), and physically inactive, overweight individuals (Berli et al., 2017). When looking at the benefits of co-participation, it appears to provide athletes with quality time with their spouse (Barnett et al., 2013), and helps with time management as co-participation serves a dual purpose of being with family and training (Barrell et al., 1989).

MAs also spoke about the influence of their peers, with an emphasis on their roles in helping them train. For instance, MAs noted how training with friends or teammates provided them with information and served as a motivator for their participation (Appleby & Dieffenbach, 2016; Makepeace et al., 2021; McCracken, 2021; Rathwell & Young, 2015). Interestingly, Young and Medic (2011a) found that training partners can be associated with obligatory sport commitment in MAs and may pressure them to train and compete. Conversely, Santi et al. (2014) found the opposite, where training partners were associated with functional sport commitment, making MAs want to train and compete. The MAs in my study spoke to obligatory forms of commitment (i.e., keeping them accountable) as well as functional forms of commitment (i.e., learning different skills and techniques, keeping them healthy, and feelings of camaraderie). Ultimately, these findings suggest that training partners help MAs adhere to sport through a multitude of motives that make MAs feel like they want, and at times, have to train and compete.

Novel to this study were the discussion of the influence of MAs' online communities and friendships. Consistent with the ever-changing technological landscape, the MAs spoke to the importance of tracking and gamification apps like Strava. These apps provided athletes with an opportunity to track workouts, share their workouts with friends, family, and teammates, as well as publicly to other users of the application. This motivated MAs as it allowed them to track their progress, compare with other athletes, and see when other athletes had completed their training sessions. There is currently very limited research on MAs' use of gamification apps such as Strava, although Makepeace and Young (2021) stated that some MAs track their training sessions and post them online as a way to socially commit to training. Additionally, Young and colleagues (2014) recommend that coaches use social media and tracking applications with their

athletes to communicate – a common practice of MAs in the study who used Training Peaks to record workouts for their coaches.

In addition to PA-related applications, traditional social media apps were also used as a way for athletes to communicate in group chats and to coordinate training sessions or competitions. Athletes also used social media to get information about workouts, equipment, upcoming competitions, or news within their sport. Research on social media usage by MAs is also very limited. One study by Geurin-Eagleman (2015) sought to understand how online communities are used by Masters gymnasts. The gymnasts used social media similarly to interact with others in their training group through a private Facebook page. Like the participants in my study, the MAs were motivated by seeing videos or reading about other athletes online, gained knowledge by interacting with other athletes and coaches, and developed a sense of community with other like-minded individuals (Geurin-Eagleman, 2015). Given the limited research on social media and MAs, the abovementioned results suggest that gamification applications, social media, and the building of online communities can help older athletes adhere to sport by acting as a motivator, a way to learn new skills, and a way to communicate with teammates, coaches, and other athletes.

In addition to traditional social media sources, the MAs spoke about the importance of virtual training software, which provided them with opportunities to train with their friends from the comfort of their own home. It also allowed them to have more meaningful and difficult workouts, which was particularly important in the winter or off-season. When exploring the use and acceptance of virtual training software such as Zwift, several professional and less-competitive cyclists noted that cycling with Zwift was an enjoyable activity that motivated them to use it more often (Westmattelmann et al., 2021). In addition to the intrinsic motivation that

Zwift fostered, the opportunity to compete in challenges and races on the app was also a motivating factor, along with the opportunity that it provided to interact and train with other people (Westmattelmann et al., 2021), which is similar to the MAs in this study.

In the Masters setting, McCracken (2021) found online trainers provided a way for MAs to train and interact with others during the COVID-19 pandemic, however, to my knowledge there is no other research that explores this venue in Masters sport. In my study, online forms of training were particularly important for adherence, as it provided MAs opportunities to train and compete with others and to participate in challenging and varied workouts. Ultimately, platforms such as Zwift or Peloton are encouraging and may be especially beneficial for PA adherence in countries where weather serves as a barrier to regular training.

The final social agent that MAs spoke about was their coaches. Coaches were used to help MAs with their personal strategies such as creating (or sticking to) a training schedule, tracking their workouts to see improvement, and to ensure that they were prepared for the competitions that they registered for. The athletes in this study wanted coaches to develop a plan that worked best for their needs, and they trusted their expertise to help them improve and be ready for competition (Callary et al., 2015; Ferrari et al., 2016). In MA populations, having a coach has been associated with increased functional commitment, meaning that coaches make MAs 'want' to participate (Santi et al., 2014). Further, commitment has been shown to be enhanced when Masters coaches tailor their coaching practices that best suit the needs of adult athletes (Currie et al., 2021; Motz et al., 2022, 2023). For many of the MAs in this study, this involved coaches meeting with them online to keep them accountable and tracking their workouts to monitor their progress and provide feedback. Taken together, these results suggest

coaches play a helpful role in MAs' adherence as they are a source of motivation, information, and accountability.

Environmental and Contextual Influences on MAs' Adherence

When discussing their adherence to sport, it became apparent that aspects of MAs' environment and context were important to their adherence to Masters sport. For instance, the athletes discussed how their previous experience as an athlete was helpful because they already understood the skills, strategies, and techniques needed for some sports. Prior experience has been theoretically and empirically linked with commitment in the past. According to the Sport Commitment Model (Scanlan et al., 1993, 2013), prior experience should be positively linked with commitment because athletes fear losing invested resources such as time, effort, or fitness when they stop participating. In line with these predictions, the MA in Rathwell and Young's (2015) study stayed committed as he did not want to lose his level of fitness. My results indicate that in addition to motivating MAs out of fear of loss, previous sport participation provides an important foundation for adhering to a regimented training program and sporting lifestyle through established knowledge of sport-specific skills and strategies.

Employment was another factor that influenced MAs adherence. Many of the athletes worked a traditional nine-to-five schedule and had flexibility in their jobs, which made it easier for them to attend practices or workouts. Moreover, MAs navigated their work requirements by creating routines. Their routines involved training at times that would not interfere with work, or by taking advantage of their flexible jobs by training during the lunch hour or starting later in the day. One athlete, who was self-employed, even dictated their work hours around their training schedule to guarantee they would not miss a session. For these individuals, their ability to work

when and where they did, along with possessing consistent and well-paying employment minimized the influence of work as a barrier.

When looking at how work acts as a barrier to sport participation, Mutz et al. (2020) found that job insecurity, along with working shift work, nights, and physically demanding jobs negatively influenced involvement in sport. This finding was corroborated by other studies that found that individuals who worked in offices, like much of my sample, had a greater likelihood of being physically active than those who worked more physically demanding jobs (e.g., Burton & Turrell, 2000). Importantly, many of the participants reported higher incomes, which has also been noted to positively influence participation across sports (Farrell & Shields, 2002). Based off the experiences of the MAs in this study, while work was a barrier in the sense that they had to dedicate large amounts of time to it, they were privileged to work in flexible, well-paying jobs that provided opportunities for them to remain involved in sport. Notably, although there was certainly luck involved in getting their jobs and having the skillsets to perform them, there was also a deliberate choice made by many MAs to seek out jobs that allowed them to participate in PA across their lifespan.

The final factor that influenced MAs' adherence was their proximity to training facilities or clubs. Several of the athletes discussed living close to where they trained which afforded them the opportunity to walk or bike to practices. Additionally, one athlete noted how she chose to live where she did due to the proximity to her rowing club, with another considering proximity to training in their decision to move or not. When looking at research on built environments, having access to facilities or parks has been shown to increase involvement in PA across several age groups and countries (e.g., McNeill et al., 2006; Liu et al., 2020; Panter & Jones, 2008; Roemmich et al., 2006; Sato et al., 2019; Utter et al., 2006). Of note, individuals who adhere to

PA and meet guidelines in older adulthood report greater access to social activities and leisure facilities in their environment, along with an increased likelihood for active transportation (Jefferis et al., 2014).

With regard to sport, both Eime et al. (2017) and Zasimova (2020) concluded that sport participation in adults is also largely influenced by access to facilities. While only one athlete in the study deliberately chose to live where they did based on their sport, the majority of the other athletes had facilities close to where they lived, which they perceived made their involvement and adherence easier. My results confirm that access to facilities influence sport participation in MAs, but also highlight an extreme example of how MAs are willing to manipulate their environments to foster their sport adherence and participation.

Chapter 6: General Discussion

The purpose of my study was to understand the strategies that MAs used to adhere to sport, and what influenced these strategies and their adherence. My findings suggest that MAs picked the sport that was right for them, stayed motivated by registering for events, used self-regulatory strategies to stay on task, and ensured that their bodies' were ready for competitions. Furthermore, they relied on others, which involved training with teammates or family, coordinating responsibilities, and hiring a coach to help them meet their goals and structure their training. All of these factors (adherence included) were influenced by environmental and contextual factors such as their work, proximity to training, and their experiences as an athlete. The current study makes several notable contributions to theory, methods, and practice.

Theoretical Contributions

From a theoretical perspective, the substantive grounded theory works to explain the behaviour of Masters sport adherence. The theory was created using experiences of athletes who had successfully adhered to sport for at least a decade and were able to maintain their participation through a pandemic. Building a theory from athletes' data was important because it provides contextualized aspects of sport and PA. This is unlike many of the theories that are commonly used within sport and exercise psychology, which have shown poor efficacy within the context of sport (Rhodes & Nigg, 2011).

The current theory may be more applicable to middle-aged or older adults who are currently engaged in adult or Masters sport. Particularly, the theory identifies strategies, social agents, and contextual factors that have been proven to impact sport adherence across the lifespan. In particular, this theory is useful because it considers sport participation while having to manage barriers that are specific to adults such as work and family responsibilities when

looking at data from athletes who were already engaged in sport. This is important as adherence for MAs is different than their younger sporting counterparts (Makepeace & Young, 2021). When looking at younger or more elite populations of athletes, much of their sport participation is facilitated by institutional supports, where they are provided with structured (and often mandatory) routines and involvement in workouts, practices, and competitions (Makepeace & Young, 2021). When looking at our MAs' data, they had to structure their own participation in sport by finding clubs, seeking out and hiring coaches, and structuring routines that best allow for training and competition.

The current findings also add to the deliberate practice literature by blending notions of performance and adherence. More specifically, the MAs in my study spoke about being architects of their own developmental environment in order to foster their sport participation and competition. This was often done through developing their relationships with their loved ones in such a way that provided them the time to stick to their routines, where they could focus on training and competing. Many MAs had or chose flexible jobs where they could manipulate or change certain aspects that best suit their participation in Masters sport. Another important aspect to consider was proximity to training facilities, where one athlete went to the extent of purchasing a home that was close to their club, and another saying they would consider their proximity to training facilities if they had to move. Finally, several MAs hired coaches to help regulate their training, provide feedback, and ultimately help them reach their goals. Notably, the socially constructed environment that the MAs lived in allowed for the use and creation of various self-regulatory adherence strategies, often through their privileged access to the time, disposable income, and personal and social resources.

The idea of a developmental environment has been discussed with regard to the deliberate practice framework through a performance lens in the past. Deliberate practice refers to an activity that an individual does with the purpose of improving, which has no immediate benefits and is often seen as unenjoyable (Ericsson et al., 1993). Ericsson and colleagues (1993) stated that there were three constraints that individuals need to navigate to attain expertise, where the individual needed an appropriate amount of *motivation* in order to train for an extended period, they needed access to *resources* to maximize their skill development and needed to be able to support high degrees of *effort* or exertion for training across the long-term. A developmental environment often refers to various environmental factors that influence the elite development of younger athletes. This environment can often be fostered through the influence of a coach, having a supportive family, and having access to facilities and resources (Young et al., 2021). In addition to the aforementioned influences, socioeconomic status, birthplace, and relative age all play a role in an athletes' ability to develop and deliberately practice (Wattie & Baker, 2018; Young et al., 2021).

The MAs in the study were deliberate in creating an environment to navigate the constraints of deliberate practice and regular sport participation as they were motivated to improve. This allowed them to maintain their motivation for over ten years, and gave them opportunities to improve, set (and reach their) goals, and train with coaches, family members, and teammates who would hold them accountable. They also relied on various training programs and facilities to maximize their training, often by training at a club or hiring a coach. They also spoke to how they exerted high degrees of effort in training, where the athletes talked about pushing themselves quite extensively several times per week with the aim of being ready for their next competition. When looking at the intentions of their training, many of the MAs worked

tirelessly to improve specific aspects of their training, such as certain skills, strategies, or overall performance. Interestingly, my findings mirror those on improving performance, despite the fact that I was interested in, and probed about, factors that influenced adherence.

While the deliberate practice framework is centered on improving performance and development, other research has focused on performance maintenance. This research has been conducted through the MSOC, where athletes select high-efficacy goals to work towards, increase their focus on specific behaviours, and compensate for physical age-related declines as a means to sustain their level of performance as they age (Baltes & Baltes, 1990). While the purpose of this model and research are designed to discuss athletes' abilities to maintain their performance, the results suggest that tenets of the MSOC are relevant to sport adherence in MAs as well. Specifically, MAs spoke about choosing sports that their bodies were capable of doing. This at times involved switching sports based on their injury history, which kept them competitive, and participating in sport for life. Taken together, it appears that many of the processes that underlie skill and performance acquisition and maintenance, derived from the deliberate practice framework and MSOC respectively, are also important to sport participation within MAs. However, my findings indicate that the two concepts might be mutually entangled when considering the sport participation trajectories of MAs may only apply to individuals who have a competitive orientation.

Methodological Contributions

From a methodological perspective, my study employed Straussian GT, which allowed for the creation of a theory to explain sport adherence in MAs. The use of this particular methodology has been popular within the field of sport and exercise psychology (see Kendellen & Camire, 2019; Knight & Holt, 2014; Roy-Davis et al., 2017; Tamminen & Holt, 2012),

especially when researchers are hoping to understand and explain a desired behaviour. To my knowledge, this also represents one of the first uses of this methodology within a population of MAs. The advantage of using this methodology was that it allowed us to learn about adherence directly from individuals who have lived experiences with successful adherence. Further, given the iterative nature of GT, where data collection and analysis occur simultaneously, it allowed us to immerse ourselves within the data. Given the need for updated theories within the field that are relevant to sport and PA (Head & Noar, 2014; Rhodes, 2014; Rhodes & Nigg, 2011), GT presents as a viable option for making substantive and general theories that are unique to sport and exercise psychology, and grounded in the experiences of those who participate in sport and PA.

Applied Contributions

There are several applied contributions that can be derived from the substantive grounded theory. By understanding how MAs are able to adhere and what influences their ability to do so, a framework can be provided to MAs that can help them maintain their levels of involvement, and adhere to regular sport and PA. Through my findings, I hope to inform individuals of what influences long-term sport participation through middle- and older-adulthood (e.g., proximity to training, work, prior athletic experience), and how to identify these factors when they are looking at how to stay active. Moreover, I hope to inform them on *who* will help them achieve their goal of staying active and involved in sport (e.g., coaches, teammates, family members), and what they can do at an inter- and intra-personal level to foster their adherence (e.g., set goals, register for events, train with a partner). This could be achieved by communicating my framework to various sport clubs with multiple age groups and Masters-specific clubs and providing them with a framework for helping athletes sustain their involvement within the sport (and club).

Based on my results, it would also be worthwhile to remind athletes that Masters sport can provide an opportunity to be competitive with themselves and others, if that is something they are hoping to get out of sport. The competitive aspect of Masters sport may be important to endorse at clubs that have athletes from several age groups. While we recruited competitive MAs, my results serve as a reminder that Masters sport is an avenue that athletes can use to remain competitive as they transition out of competing at a higher level. This is important as many retired athletes are known to stop or drastically reduce their involvement in sport and PA and tend to not meet PA recommendations after they leave the competitive sport environment (Eime et al., 2019; Riddoch et al., 2004; Simon & Docherty, 2017; Sorenson et al., 2014; Yao et al., 2020). Within this vein, for athletes who had to retire due to injury, my results suggest that clubs might benefit by promoting alternative sports and emphasizing how athletes can still improve or compensate for injuries in these new sports. These promotion efforts could ensure a transition into Masters sport, and keep individuals involved in regular sport and PA across the lifespan by fostering their adherence and catering to their competitive desires.

Limitations and Future Directions

This study of adherence in MAs is not without limitation. First, the participants tended to be highly educated, white, and affluent. While the sample is not representative of the general Canadian population, it is representative of most Masters sport populations (e.g., Dionigi et al., 2012, 2013; Hoffmann et al., 2020; Larson et al., 2021; MacDonald et al., 2009; Motz et al., 2022; Patelia et al., 2019, 2023; Rathwell et al., 2020). For instance, Dionigi and Litchfield (2018) noted that Masters sport participation and competition in international Masters events are typically dominated by middle-class individuals who have an affinity for competition, travel, consumption, and socialization. Thus, while MAs represent a model population for

understanding sport adherence, it is important to note that they remain a privileged group with regard to their socioeconomic status. Further, I recognize that MAs may only be a model group when conceptualized through a largely Westernized notion of healthy aging, which promotes physical activity to resist the dominant discourses around 'old age' or to delay the aging process (Dionigi & O'Flynn, 2007; Dionigi et al., 2013b). When looking through the lens of other cultures that actually embrace or encourage inactivity with increasing age, my results may be less applicable or useful for intervention purposes (Tulle, 2008). Thus, I put forth that findings from my study may only be applicable to adults who are currently participating in Masters sport. Additionally, my study (and others on Masters sport and Masters competitions) will be most applicable to individuals who have the disposable income, time, and effort to participate in Masters sport, can cover the associated costs (e.g., registration, equipment), and can travel in order to fulfill their competitive desires and maintain their level of PA.

It is very likely that strategies might have been different with a less privileged cultural and socio-economic perspective. In the current study, I made several attempts to acquire a more diverse sample but was unsuccessful. Young and Callary (2018) elaborated that one reason behind a lack of diversity in Masters sport research may be due to the recruitment process that researchers have undertaken, where they tend to use convenience sampling and recruit at (inter)national competitions. The problem with this strategy is that this favors athletes who have the financial means to travel, register, and compete at competitions such as these (Young & Callary, 2018). For this study, I attempted to recruit from clubs in various sports from across the country via email and completed data collection virtually to minimize barriers associated with travel. Unfortunately, despite my efforts I ended up with a sample that is very similar to that of the pre-existing literature.

Future research should place greater attention on trying to diversify samples in Masters sport. Perhaps one strategy might be to change the terminology when conducting recruitment, for instance instead of recruiting 'MAs', using terms like 'adult athletes' or 'adults who participate in sport' may be helpful as some sports or governing bodies may not use the term 'MA.' This may be more encompassing for individuals who may meet the various inclusion criteria for studies but do not consider themselves to be athletes or are unfamiliar with Masters sport. It may also be beneficial to recruit from sports that are more accessible to individuals with a lower socioeconomic status and have lower associated costs and/or less equipment (e.g., basketball, soccer). Alternatively, focusing recruitment efforts to sports that are more popular across the globe (e.g., soccer, cricket) may result in a more inclusive sample.

Another limitation of my study was that I only included athletes from individual-based events or sports. The team setting may present additional team-based influences as large portions of their training and competition is dependent on their teammates. It has been previously noted that various underlying concepts related to team sport influence adherence in other populations. For instance, Carron and colleagues (1988) noted that the level of cohesion within adult fitness classes, as well as recreational and elite team sports, influenced individuals' adherence to the group and PA. Similarly, Bruner and Spink (2011) concluded that team building increased adherence to adolescent exercise groups. While these factors have been shown to influence adherence in younger populations, they remain relatively under-studied in MAs.

A final limitation to my study was the age range of the participants. A goal of mine was to have athletes who were still employed to ensure that they faced common barriers to PA. However, this led to a large age range (i.e., 36 to 65 years of age) and resulted in very different experiences about family life, which in turn influenced their experiences in Masters sport.

Having a narrowed age range (e.g., 35 to 50 years) may have resulted in more MAs with children who were still living at home. Having more athletes who were currently balancing their childcare responsibilities with work and sport might have resulted in more strategies for overcoming a very commonly discussed barrier to PA and sport participation for adults (e.g., Jenkin et al., 2018; Mailey et al., 2014, 2016).

Conclusion

The results of this study outline the different strategies, social agents, and environmental and contextual factors that influence sport adherence in MAs. By understanding how MAs maintain their regular involvement in PA and sport at a time where many are insufficiently active, we may be able to inform other active adults or MAs on how to sustain (or increase) their current levels of PA. Specifically, this study looked at maintenance in a population that has an elevated likelihood of sustaining their participation in sport and PA due to their socially constructed environments and the socioeconomic privileges they possess. This important to note because if sport and PA adherence does not work in this population, it is unlikely that it will work for others who are in a less privileged position. As such, the current study acts as a preliminary proof of concept for adherence strategies that can be used in populations that are most likely to adhere to sport. Further work is needed to understand which adherence strategies can be useful or how adherence strategies can be adapted for less privileged groups of adults seeking to increase or maintain their physical activity involvement.

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Appendix 1: Athlete Recruitment Letter

To whom it may concern,

You are being invited to participate in a research study on Masters athletes at the University of Lethbridge. This is a research study that aims to understand how Masters athletes are able to stay active in sport. Through your participation, we hope to better understand the strategies that Masters athletes use to maintain regular sport participation, with the goal of creating a theory that outlines these strategies. Data for this study will be collected for the purposes of a Master's Thesis at the University of Lethbridge under the supervision of Dr. Scott Rathwell.

For this study, you will be asked to participate in either 1 or 2 interviews conducted over Zoom. Interviews will be conducted in English. Each interview will take approximately 60-90 minutes. Those selected for a second interview will be notified by email with the interview being scheduled for a time that works best for you. This second email will take approximately 30-60 minutes.

This study is being conducted in accordance with the Human Participant Research Committee at the University of Lethbridge. Your participation in this research will be completely voluntary. You will also reserve the right to withdraw from the study at any time. There will be no negative consequences should you wish to withdraw from the study. If you withdraw from the study, any information collected from you will be destroyed upon your request.

If you agree to participate, several steps will be taken to protect your anonymity and identity. The typed interviews will not contain any mention of your name, and any identifying information from the interview will be removed. Any personal information will be saved on a password locked computer, with the room being locked when the researcher is not present. Any paper copies of the typed interviews will be stored in a locked filling cabinet in the same room. Only the primary researcher (Zakry Walsh) will have access to the interviews. Pseudonyms will used in place of your name in any published findings, presentations, or conferences to ensure confidentiality. Data will be conserved for 10 years following the conclusion of data collection.

The current study will inform researchers of how Masters athletes are able to maintain consistent sport participation throughout adulthood and for some, the lifespan. Particularly, in a time where large portions of the Canadian (and global) population are increasingly physically inactive. The results of this study will be used to create a theory of masters sport adherence. This theory may also provide strategies for other older adults who are beginning to compete in Masters sport, as well as older adults who participate in less competitive sports.

If you are interested in participating in this study, contact primary researcher, Zakry Walsh, via email at zakry.walsh@uleth.ca to inform him of your interest. Afterwards, you will be sent a link containing an online letter of consent and a demographic questionnaire that asks for various personal and sport-related information. Following this, the primary researcher will email you to arrange a time and date that is most convenient for you to be interviewed.
If you have any questions about the study, please feel free to email the primary researcher at zakry.walsh@uleth.ca. If you have any questions about your rights as a participant in research,

you may also contact the Office of Research & Innovation Services at the University of Lethbridge by phone at 403-329-2431 or by email at oris@uleth.ca.

Thank you for your consideration,
Zakry Walsh, BSc.
Scott Rathwell, PhD
University of Lethbridge
Faculty of Arts & Science
Department of Kinesiology & Physical Education
4401 University Drive
Lethbridge, Alberta, Canada
T1K 3M4

Appendix 2: Online Consent Form

INFORMATION LETTER and CONSENT FORM

Study Title: Understanding Sport Adherence in Masters Athletes: A Grounded Theory

Research Investigator:
Zakry Walsh
4401 University Dr. W
Lethbridge, AB, T1K 3M4
Zakry.walsh@uleth.ca

Supervisor: *(applicable for student-led research)*
Scott Rathwell
4401 University Dr. W
Lethbridge, AB, T1K 3M4
Scott.Rathwell@uleth.ca

Background

You are being invited to participate in a research study on Masters athletes at the University of Lethbridge. The results of this study will be used in support of my thesis required for the completion of the Masters of Arts degree specializing in Kinesiology. The findings of this study will be presented in journals read by experts in the field of exercise and sport psychology. Additionally, the findings will be presented at the primary researcher's thesis defense to members of the university community. Before you make a decision, you are encouraged to ask questions if anything needs to be made clearer. You will be given a copy of this form for your records.

Purpose

This is a research study that aims to understand how Masters athletes are able to stay active in sport. Your participation will help us better understand the strategies that Masters athletes use to regularly participate in competitive sport, with the goal of the study being a theory that was created with the help of your participation that outlines these strategies.

Study Procedures

- Your participation in this study will require you to complete two types of data collection. The first of which is through completing a questionnaire that asks for personal information and information regarding your participation in Masters sport. The second will be through an interview conducted online through Zoom. Some individuals will be invited to participate in a second interview.
- You will be emailed an invitation to complete an online questionnaire. This questionnaire will contain a consent form for you to read, clicking the button to advance to the next section will act as providing consent to participate in all phases of the study, though you reserve the right to leave the study at any time without repercussions. This questionnaire has two main sections. The first asks for personal information such as age, education level, income level, ethnicity, etc. The second section asks questions about your experiences in Masters sport. Some questions in this section ask about the sports you compete in, how often you practice or train, etc. This questionnaire provides us with information to determine whether you can participate in the study and to provide us with specific questions to ask in your interview. It is estimated that this questionnaire will take 15-30 minutes to complete.
- Questionnaire responses will be reviewed by the primary researcher, and those selected will be contacted via email and asked to participate in an interview.
- If you are chosen to participate in an interview, you will be contacted via email and asked to schedule an interview. Interviews will be conducted online on Zoom. You will be sent a link for their interview on the day of the scheduled interview. Interviews are anticipated to take 1-2 hours. Questions will be asked regarding your responses to the questionnaire, your sporting experiences, and the strategies you use to help you participate in regular sport. These interviews will be recorded and transcribed word-for-word, with the recording being deleted immediately after the transcription. Some individuals will be asked to participate in a second interview. If you are selected for a second interview, you

will once again receive an email asking to set a date and time for this to be conducted. The second interview will likely take approximately 1 hour of your time.
- Following the transcription of the interviews, you will be sent a copy to ensure that all the information is accurate to your experiences and to your responses in the interview. Any information in the transcripts that you wish to not have included will be removed upon your request.

Benefits

- You may find the opportunity to participate in this study enjoyable and rewarding, as it may provide you with a unique opportunity to discuss your participation in Masters sport in great detail.
- By participating in this study, you will help us understand ways that Masters athletes are able to stay active in sport. These strategies may help other individuals who are actively competing and participating in sport, or those who are starting (or thinking of starting) to participate in sport.

Risk

- There are no anticipated risks of participating in this study. There may be risks to being in this study that are not known. If we learn anything during the research that may affect your willingness to continue being in the study, we will tell you right away

Voluntary Participation

- Your participation in this study is completely voluntary, and there is no obligation for you to participate. As a participant, you reserve the right to withdraw from the study at any point. There will be no negative consequences if you wish to withdraw from the study.
- You reserve the right to decline answering any questions should you wish to do.
- If you wish to withdraw from the study, any information collected from you will be destroyed upon your request. If you notify the researcher within one month of your participation, your data will be deleted from all hard drives and devices that the researcher is using for this study. If the researcher is not notified, information collected from you may still be used in the study. There will be no negative consequences for requesting that your data not be included in the study.
- Prior to your first interview, the primary researcher will go over the consent form with you again to remind you of your rights as a participant.

Confidentiality & Anonymity

- The results from this study will be presented in writing in journals read by exercise and sport psychologists, to help them better understand the strategies that Masters athletes use to maintain regular sport participation and competition. The results will be presented in person to various university officials and professors, and the public at the main researcher's thesis defense. The results may also be presented in person to groups of Masters athletes and coaches. At no time, however, will your name be used, or any identifying information revealed.

- All data will be kept confidential with only the primary researcher (Zakry Walsh) having access to the data.
- You will be assigned a pseudonym that will be used in place of your name in any publication, presentation, or conference where the project will be discussed.
- You will be assigned a code that will be used during the transcription in place of your name. Any mention of your name in the interview will be replaced with this code. A file containing your name and your assigned pseudonym and code will be saved on a password locked computer that only the primary researcher has access to. This computer will be stored in a locked office.
- Any paper copies of the typed interviews will be stored in a locked filing cabinet that only the primary researcher has access to. This cabinet is in the same locked office.
- Questionnaire responses and data will be saved on the hard drive of the primary researcher's password locked computer. This data will also be stored on the website in which the questionnaire is conducted, Qualtrics. Since the questionnaire is being conducted online, full confidentiality cannot be guaranteed.
- Collected data will be stored for 10 years on the primary researcher's computer and will then be destroyed and deleted following this time.
- Following your participation, you will be asked if you would like to receive a copy of the report of the research findings upon its completion. If you wish to receive a copy, this will be emailed to you. If you decide that you do not want to receive a copy of the findings, you can still receive a copy if you email the primary researcher later.
- Following your participation, you will be asked if you would be interested in participating in future research that will be studying Masters athletes. There is no obligation to do so. If you are interested in participating in future research, you will be notified of upcoming research opportunities via email.

Contact Information

If you have any questions regarding your participation in this study don't hesitate to contact:

Zakry Walsh (Primary Researcher)
Email: Zakry.walsh@uleth.ca

Scott Rathwell
Email: Scott.Rathwell@uleth.ca

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call the University of Alberta's Research Ethics Office at (780) 492-2615 or you can contact the University of Lethbridge's Office of Research & Innovation Services at (403) 329 2431 or oris@uleth.ca. These offices are independent of the researchers.

Consent Statement

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional

questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I will receive a copy of this consent form after I sign it. By hitting the 'next' button on this questionnaire, I have consented to participating in all phases of this study.

Appendix 3: Online Screening Questionnaire

Section 1: Demographics

Q1) What is your age in years?

Q2) What gender do you identify as?

Q3) What race/ethnicity do you identify as?

Q4) What province do you currently reside in? If multiple, please select the one which you spend the most time living in?

- Alberta
- British Columbia
- Manitoba
- New Brunswick
- Newfoundland and Labrador
- Northwest Territories
- Nova Scotia
- Nunavut
- Ontario
- Prince Edward Island
- Quebec
- Saskatchewan
- Yukon Territories

Q5) What is the highest degree or level of school you have completed?

- Less than a high school diploma
- High school diploma or equivalent
- Some college, no degree
- College degree/diploma
- Bachelor's Degree (e.g. BA, BSc)
- Master's Degree (e.g. MA, MSc, Med)
- Doctorate or professional degree (e.g. MD, DDS, PhD)

Q6) What is your marital status?

- Single (never married)
- Married, or in a domestic partnership
- Widowed
- Divorced, or separated

Q7) How many children do you have?

Q8) What is your current employment status?

- Employment full time (30 or more hours per week)
- Employment part time (up to 30 hours per week)
- Unemployed and looking for work
- Retired
- Self-employed

Q9) What is your current occupation? (If retired, please identify your former full-time occupation)
Q10) What is your annual income (CAD)? (If retired, please select your past average annual income)

- Less than $40,000
- $40,000-$59,999
- $60,000-$79,999
- $80,000-$99,999
- $100,000-$119,999
- $120,000 or more
- I prefer not to answer

Section 2: Adult Sport

Please read the following definition of a Masters athlete.
Masters athletes are athletes who participate in competitive sport later in adulthood. These athletes are typically 35 years of age or older, registered in formal leagues, events, races, games, or tournaments, and are competitively oriented in sport (i.e., train to prepare for their competitions).
Q11) Based on the aforementioned definition, do you identify as a Masters athlete?
Q12) How many years have you actively competed in Masters sport?
Q13) What best describes your athletic history as you entered Masters sport?

- I competed in organized sport throughout my life, and I continued doing so through Masters sport
- I used to be an athlete and then stepped away for several years before re-entering organized sport through Masters sport
- I never really competed in organized sport until I entered Masters sport

Q14) List and rank the sports you compete in currently by priority with 1 being the highest priority and 5 being the lowest priority

1)
2)
3)
4)
5)

Please answer the following questions as they pertain to your participation (i.e., for competition and training) in all of your Masters sports combined (i.e., all sports listed in question 14).
Q15) How many months per year do you dedicate to all of your Masters sports?
Q16) How many hours per week do you dedicate to all of your Masters sports?
Q17) In an average year, how much money do you spend on Masters sport (e.g., club fees, equipment, competition fees, etc.)?
Please answer the following questions as they pertain to your participation (i.e., for competition and training) in your primary sport. Your primary sport refers to the sport you listed at number 1 on question 14.
Q18) How many months per year do you dedicate to your primary sport?

Q19) How many hours per week do you dedicate to your primary sport?
Q20) Do you have a coach for your primary sport?

- Yes
- No

Q21) Do you actively try to win when you compete in your primary sport?

- Yes
- No

Q22) In an average season, how many competitions (i.e., meets, tournaments, games, etc.) do you compete in for your primary sport?
Q23) What is your level of competition for your primary sport as a Masters athlete? (Please select all that relate to you)

- Recreational
- Regional/Local
- Provincial
- National
- International

Q24) In the last 10 years, have you experienced an extended lapse (more than 4 consecutive months) from your Masters sport competition and sport-specific training?

- Yes
- No

Appendix 4: Interview Guide

1. What sports or events do you currently participate in?
    a. What led you to participate in these specific events?
2. Are there any sports or events that you no longer compete in?
    a. If so, why did you stop participating in them?
3. You listed X as your primary sport, why did you choose this as your primary sport?
4. How often do you train per week?
5. Do you have a coach that you work with?
        i. How often do they attend training sessions?
6. What level of competitions do you typically compete in during a regular season?
7. How long is your season?
8. Are there certain months where your involvement in the sport is greater than others?
9. We're going to go back to when you first started competing in Masters sport, can you recall how you first started participating and competing?
10. What strategies did you first use to ensure that you continued participating in Masters sport when you first began competing?
    a. Why do you believe this strategy has helped you? (Ask for each strategy)
11. Once you began competing and training regularly, did the strategies or techniques that you initially used change?
12. What strategies do you currently use to maintain your participation in Masters sport?
    a. Why do you think this strategy helped you? (Ask for each strategy)
13. Do you have any routines for days that you train and compete?
    a. If so, what is it?

i. Does this routine help you maintain regular participation in your sport?

14. In what ways does your job allow you to regularly train and compete in your primary sport?
15. How close do you live to where you compete and train for your primary sport?
    a. Did you choose to live where you do because of the access to the club or facilities?
    b. Do you believe your proximity and access to the facilities has influenced your ability to regularly compete and train in your primary Masters sport?
16. Does your family influence your participation in any way?
    a. If yes, how so?
17. Do your friends/coworkers influence your participation in any way?
    a. If yes, how so?

As data analysis continues, questions will be added regarding specific strategies or codes that emerged in prior interviews.

Ex. Other athletes have mentioned that they use [strategy] to help them participate. Does this also help you maintain your participation?

- If so, how influential is this strategy?
- How does it specifically allow you to maintain your participation?