

Physical Activity and Sport Participation following the Transition from Secondary School to Tertiary Study: An Insight into the Changes in, and Influence of, Motives, Negotiation Strategies, and Constraints

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A thesis submitted to Auckland University of Technology
in partial fulfilment of the requirements for the degree of
Master of Sport and Exercise (MSPEx)

2016

Faculty of Health and Environmental Sciences
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Abstract

Though physical activity and sport participation (*participation*) tends to decline across the lifespan, the decrease is pronounced following the transition from secondary school to tertiary study (*transition*). Many factors influence tertiary student *participation*, including socio-demographic variables, motives for *participation*, and the ability to employ negotiation strategies to overcome perceived constraints to *participation*. There is limited research on changes in *participation* following the *transition*, and more importantly the factors that influence *participation*, particularly in New Zealand (NZ). This cross-sectional component mixed methods study explores changes in *participation* following the *transition*, and the factors that influence *participation* following this transition.

Data was collected from 121 first-year students at a NZ university during 2015 using an online questionnaire following students' end-of-year exams. Data was collected on the: *participation* duration and frequency, and types of physical activity in relation to secondary school and tertiary study; various socio-demographic variables; motives, negotiation strategies, and constraints using items drawn from previously validated instruments; and, changes in *participation*, motives, negotiation strategies, and constraints using open-ended questions. The underlying structures of motive, negotiation, and constraint instruments were analysed using principal axis factoring. Differences between groups were explored using complementary parametric and non-parametric techniques, and relationships between variables were explored using parametric techniques. Thematic analysis identified the dominant themes and sub-themes in qualitative data.

The study found that students' *participation* had decreased significantly following the *transition*. Students' *participation* preferences/patterns had shifted: from participation in team/group sports to participation in individual/independent physical activities; and, to less competitive and/or more social forms of sport. Constraints had a negative relationship with *participation*, whereas motives and negotiation had significant positive relationships with *participation*. Partial correlation analysis revealed negotiation mediated the relationship between motives and *participation*, which is consistent with extant literature. Motives, negotiation, and constraints

differed significantly based on socio-demographic variables and *participation* levels, and between participants and non-participants in different types of physical activity. Intrapersonal constraints emerged as the greatest constraints after time constraints, which in contrast to existing theories would appear to represent a distinct type of constraints and/or bridge intrapersonal, interpersonal and structural constraints.

The findings of this thesis are key to understanding what influences tertiary student *participation* following the *transition*, and perhaps beyond. Results provide evidence to inform policy and the development of interventions to be employed within a tertiary institution setting. Until tertiary institutions, and society for that matter, place a priority on facilitating tertiary students to form life-long physical activity habits during this critical period in their lives student physical activity is unlikely to increase, and in fact will likely to continue to decrease.

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Glossary of Terms

Constraints - factors, perceived or experienced by individuals, that inhibit or limit leisure participation and/or enjoyment (Jackson, 2000).

Constraints theory (CT in text, also referred to as leisure constraints theory, and hierarchical leisure constraints theory in the literature) - proposes that the theoretical constructs of intrapersonal, interpersonal, and structural constraints are arranged hierarchically (i.e. proximal (intrapersonal) to distal (structural)) and must be negotiated sequentially for leisure participation to take place or continue (Crawford & Godbey, 1987; Crawford, Jackson, & Godbey, 1991; Godbey, Crawford, & Shen, 2010; Jackson, Crawford, & Godbey, 1993).

Intrapersonal constraints - are described by Crawford and Godbey (1987) as those that reside within the individual, and stem from the interaction between one's psychological states and attributes and one's leisure preference(s), rather than intervening between preferences and participation. Intrapersonal constraints include: a lack of self-efficacy (i.e. competence, which is related to past experience), a lack of interest or motivation, a lack of physical ability, stress, anxiety, depression, religion, and subjective evaluations of an activity's appropriateness and availability.

Interpersonal constraints - stem from the social interactions and/or relationships between individuals, which interact with preferences for, and participation in leisure activities. They result from either non-correspondence of individuals' intrapersonal constraints, or from one's interpersonal relationship patterns (Crawford & Godbey, 1987). Interpersonal constraints may stem from a range of reasons, including a conflict in preferences, a difference in skill level, a lack of availability; as well as a lack of tangible support from significant others.

Structural constraints - are conceptualised by Crawford and Godbey (1987) as factors that exist within the environment and intervene between leisure preferences and participation, i.e. barriers as traditionally conceptualised. Examples according to CT include: time, money, physical location, availability of opportunities, and knowledge of availability of opportunities.

Flatting - A living arrangement whereby a “flat”, i.e. house or apartment, is let out to a group of people.

Insufficiently active - those with a weekly *participation* duration less than 150min.

Motives - stemming from the theoretical construct of motivation, motives represent the reasons for people's actions, desires, and needs.

Negotiation Strategies - strategies, behavioural and cognitive, employed by individuals to overcome, i.e. negotiate, constraints to participation.

Participation (*participation* in text) - physical activity and sport participation.

Self-determination theory (SDT in text) - is based on the premise that humans inherently possess the psychological needs for autonomy, competence, and relatedness, which facilitate the adoption of behaviours or activities that fulfil/satisfy these needs.

Student - tertiary student unless otherwise specified.

Transition (*transition* in text) - the transition from secondary school to tertiary study.

University accommodation - university administered accommodation, in most cases located on-campus.

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.



Oliver Wilson

7 September 2016

Acknowledgements

Although the completion of thesis involved a lot of work on my part, it is important to acknowledge and thank a number of individuals for their assistance over the past year.

To my family, thank you for your on-going support and encouragement. Dad, thank you for acting as a sounding board and your willingness to talk things over with me. Mum, thank you for allowing Dad the time to talk things over with me, and more importantly helping me get back on my feet as quickly as possible. To my sister, Amelia, thanks for your efforts proof reading parts of this thesis.

To Simon Walters, my primary supervisor, thank you for your support and patience, and knowing when to push me to do more and hold me back.

To Michael Naylor, my secondary supervisor, thank you for encouraging me to become more decisive and have greater confidence in my instincts, questioning my use of statistical procedures, and forcing me to discover the answers myself.

To Jenny Clarke, my additional supervisor, I feel truly indebted to and grateful for your support, reassurance, and enthusiasm. You have given up an incredible amount of your time in helping me negotiate various obstacles and assist with the most mundane grammatical questions.

I would like to acknowledge the support I received from various University of Canterbury (UC) staff, departments and clubs. Firstly, Dr Jim Dragna (Student Success Director) and Professor Richard Light (Head of School of Sport and Physical Education) who co-supported the project. In particular Professor Richard Light, who submitted the UC HEC application, and contributed towards the participant prizes. Thank you to Kaylene Sampson from the UC Academic Services Group who advised on the survey distribution and the UC Survey Reference Committee application. Thank you to Trudi Zawodny and Elizabeth Spivey from UC Enrolment Services who provided the contact details of all participants as well as respondents' additional socio-demographic data. Thank you to the various other UC departments, staff, and student clubs who helped to promote the project to students.

Finally, thank you to all of the participants who took the time to complete the survey and offer some extremely insightful comments.

Ethical Approval

The application for ethical approval to the University of Canterbury Human Ethics Committee (UC HEC) was completed in October 2015, and submitted by Professor Richard Light (Head of School of Sport and Physical Education) on behalf of Oliver Wilson. Ethical approval was granted on the 29th of October 2015 by the UC HEC. Reference HEC 2015/129 (**Appendix A**).

The application for ethical approval to the Auckland University of Technology Ethics Committee (AUTEK) was completed in November 2015, and submitted by Simon Walters. Ethical approval was granted on the 10th of November 2015 by AUTEK. Reference 15/400 (**Appendix A**).

Survey Approval

The application for survey approval to the University of Canterbury Survey Reference Group (UC SRG) was completed in October 2015, and submitted by Oliver Wilson. Survey approval was granted on the 13th of October 2015 by the UC SRG (**Appendix B**).

Chapter 1: Introduction

1.1. Physical Activity in Contemporary Society

Changes in workplaces, technology and lifestyles have led to a less physically active population. Technological advancements in particular have reduced the physical effort required in most aspects of contemporary lifestyles in many societies, permitting more sedentary work and leisure alternatives to be offered than previous years. As a result, the maintenance of physically active lifestyles is an area of increasing concern in contemporary society.

Physical activity and sport influence many aspects of life and society, including: individuals, by benefiting their personal health and well-being, and fostering social networks and a sense of belonging; communities, through the creation of social cohesion and social capital; the economy, through the creation of jobs; and, countries, through the building and maintenance of national and cultural identity (Bloom, Grant, & Watt, 2005). Thus, it should come as no surprise that increasing levels of physical inactivity impose a number of costs on individuals, communities, economies, and countries.

1.2. The Costs of Physical Inactivity

At an individual level, there are a number of costs of insufficient physical activity (i.e. failure to achieve levels of physical activity to benefit health). The greatest cost to the individual is premature death, that is, death before a person reaches an expected age. According to the World Health Organisation (WHO), physical inactivity is the fourth leading cause of death worldwide (Kohl 3rd et al., 2012; WHO, 2015b) causing an estimated 3.2 million premature deaths globally (WHO). It is therefore not surprising that some refer to physical inactivity as a pandemic that should be a public health priority (Kohl 3rd et al.). Those who are insufficiently active also have a 20-30% increased risk of premature death compared to those who are sufficiently active (WHO, 2015). The premature deaths of 246 New Zealanders aged under 65 years were attributed to physical inactivity in 2009, and physical activity may have prolonged the lives of many aged over 65 whose deaths were caused by diseases associated with physical inactivity (Auckland Council, Waikato Regional Council, & Wellington Regional Strategic Committee, 2013).

The association between physical inactivity and premature death is largely attributable to physical inactivity being a key risk factor for the contraction of non-communicable diseases (NCDs). According to Lee et al. (2012), whilst adjusting for confounding factors, physical inactivity increases the relative risk of New Zealanders contracting the following NCDs: coronary heart disease (7.9%), type II diabetes (9.8%), breast cancer (13.1%, for women only), colon cancer (14.1%), and all causes of death (12.7%). These rates are considerably above the global and Western Pacific country averages. Along with NCDs comes a personal financial burden, as well as a poorer perception of one's quality of life (Pucci, Rech, Fermino, & Reis, 2012).

Aside from costs to the individual, physical inactivity also has a negative influence on the economy as NCDs result in lost productivity (Chaker et al., 2015). Furthermore, physical inactivity inflicts a considerable cost on the taxpayer. By way of example, a report commissioned by several NZ Regional Councils showed that physical inactivity cost the NZ taxpayer \$1.3 billion in 2010 (0.7% of gross domestic product; Auckland Council et al., 2013)

1.3. Benefits of Student Physical Activity

In the case of tertiary students, the perceived benefits of physical activity, or more broadly *participation*, include numerous physical (Bray & Born, 2004; Forrester, Ross, Hall, & Geary, 2007; Grubbs & Carter, 2002; Henchy, 2013; Qianyu & Ross, 2014), social (Artinger et al., 2006; Elkins, Forrester, & Noël-Elkins, 2011; Zarei, Jackson, & Pira, 2013) psychological (Artinger et al.; Bray & Born; Elkins et al.; Forrester et al.; Grubbs & Carter; Henchy; Kanters, 2000; Kimball & Freysinger, 2003; Qianyu & Ross), and academic benefits, such as improved academic engagement (Moffitt, 2010) and performance, i.e. improved grade point average (GPA) (Belch, Gebel, & Maas, 2001; Khan, Jamil, Khan, & Kareem, 2012).

Student *participation* is also associated with a number of institutional benefits, including: the creation of a sense of campus community (Chen, 2002; Elkins et al., 2011), and helping students to develop a sense of belonging and association to the institution (Artinger et al., 2006; Henchy, 2011, 2013; J. J. Miller, 2011). This affinity for the institution may explain why *participation* has been associated with student recruitment and retention (Belch et al., 2001; Henchy; Lindsey & Sessoms, 2006; J. J.

Miller) via opportunities for students to continue participating in activities that they enjoy. However, despite all of the *participation* benefits, many NZ students fail to meet physical activity recommendations (Rogers, 2015; Sinclair, Hamlin, & Steel, 2005). Though physical activity tends to decline across the lifespan (Sport NZ, 2015b), the decline is more pronounced during certain life transitions, such as from studying at secondary school to pursuing a tertiary education.

1.4. Physical Activity and the Transition from Secondary School to Tertiary Education

A significant reduction in students' *participation* following the *transition* has been reported (Bray & Kwan, 2006; Deforche, Van Dyck, Deliens, & De Bourdeaudhuij, 2015; Han et al., 2008; Kwan, Bray, & Ginis, 2009; Rogers, 2016; Sinclair et al., 2005; Ullrich-French, Cox, & Bumpus, 2013; Van Dyck, De Bourdeaudhuij, & Deliens, 2014). The *transition* is a period when tertiary students' *participation* can be influenced by changes in different aspects of their lives. For most, the *transition* marks the movement from adolescence into young adulthood, and involves major lifestyle adjustments (Gall, Evans, & Bellerose, 2000; Terenzini et al., 1994). First-year students may encounter academic, social, physical, emotional, and even cultural changes following the *transition*, which also disrupts routines individuals were accustomed to having as secondary school students (Bray & Born, 2004). Maintaining adequate levels of physical activity through and following the *transition* is key, as the *transition* is characterised by the exploration of many alternative experiences, and is influential in the adoption of an active lifestyle that may continue throughout one's life (Öcal, 2014). For example, Forrester et al. (2007) found evidence that participation in physical activities whilst a student has a positive association with participation in physical activities in later life. Furthermore, physical activity may help students avoid serious future health and well-being issues, as insufficient physical activity potentially heightens the risk of developing chronic diseases later in life (Deforche et al.; Reiner, Niermann, Jekauc, & Woll, 2013).

1.5. Factors Influencing Participation

Participation is influenced by a range of factors, including personal characteristics, knowledge, attitudes, and beliefs (Chan Sun & Azmutally, 2013). A complete understanding of changes in students' *participation* following the *transition* requires investigation of all of the factors that influence decisions related to *participation*, both positive and negative (Jackson, 2000). Aside from various socio-demographic variables, motives, negotiation strategies, and constraints are three factors that have been shown to interact with one another and have different relationships with *participation*.

1.6. Conceptual Framework

The constraint negotiation process provides the conceptual framework for this study. The constraint negotiation process stems from Jackson, Crawford, and Godbey's (1993) extension of leisure constraints theory (Crawford et al., 1991) that formally introduced the concept of negotiation and incorporated motives into the constraint negotiation process. Leisure constraints theory has gone through a series of conceptual developments since its initial conception by Crawford and Godbey (1987). The theory states that the three categories of constraints (intrapersonal, interpersonal, and structural constraints) are arranged in a hierarchy from the most proximal (intrapersonal) to the most distal (structural) that reflects the importance of constraints, and the order in which individuals must negotiate constraints sequentially in order to participate (Crawford et al.).

Beginning with Hubbard and Mannell (2001), by comparing the competing constraint negotiation process models, researchers examined relationship(s) between motives, negotiation, constraints, a particular type of physical activity (the dependent variable), and in some cases, other psychological and socio-demographic variables (Covelli, Graefe, & Burns, 2007; Hubbard & Mannell, 2001; Loucks-Atkinson & Mannell, 2007; Lyu, Oh, & Lee, 2013; Son, Kerstetter, & Mowen, 2008; Son, Mowen, & Kerstetter, 2008; White, 2008; Wilhelm Stanis, Schneider, & Russell, 2009; Wood, 2011). At present, there remain two main points of contention among constraints negotiation process researchers. These concern the nature of the relationships between motives and physical activity, and constraints and physical activity

respectively. The lack of consensus amongst researchers is potentially attributable to the variation in instruments used and the context in which studies have been conducted.

In the case of the relationship between constraints and physical activity, most previous studies have supported the 'constraint-effect-mitigation model', where constraints have a positive relationship with, i.e. trigger, negotiation, but also have a direct negative relationship with physical activity (Covelli et al., 2007; Hubbard & Mannell, 2001; Loucks-Atkinson & Mannell, 2007; White, 2008; Wilhelm Stanis et al., 2009). In contrast, the single student-focused constraint negotiation process study supports the alternative 'perceived-constraint-reduction model', where negotiation has a negative, i.e. reductive, relationship with constraints (Wood, 2011). Wood's study examined the constraint negotiation process in relation to Canadian undergraduates' participation in intramural sports, whilst also incorporating the construct of ego-involvement. The difference between Wood's findings and those of other researchers may be influenced by Wood's inclusion of only those who were already active in a physical activity, as well as the relatively restrictive negotiation and constraint measures used.

The key difference between the two models is the nature of the relationship between constraints and negotiation. Both are possibilities according to Jackson et al. (1993). In addition, other studies have reported no statistically significant relationship between constraints and negotiation, which has been termed the 'dual channel model', where the two constructs have opposing yet independent effects on physical activity, to distinguish it from the other models (Son, Kerstetter, et al., 2008; Son, Mowen, et al., 2008). However, this may indicate that the positive and negative effects of negotiation and constraints have effectively cancelled one another out. In terms of motives and physical activity, researchers are divided on whether the relationship is partially (Loucks-Atkinson & Mannell, 2007; White, 2008; Wilhelm Stanis et al., 2009), or fully (Covelli et al., 2007; Hubbard & Mannell, 2001; Son, Kerstetter, et al.; Son, Mowen, et al.) mediated by negotiation.

1.7. Study Purpose

The overarching purpose of the study was to produce insight that could help shape initiatives to both encourage and facilitate tertiary students to initiate, maintain, or increase *participation* following the *transition*.

1.8. Study Aims

In light of Wood's (2011) research, there is a gap in the literature when it comes to the constraint negotiation process in the context of tertiary students. This leads to the first of this study's two aims: to assess the relationship(s) between *participation* and influencing factors (motives, negotiation strategies, and constraints). The second aim of this study is to examine and explore how *participation* and influencing factors change following the *transition*, which was achieved using a combination of quantitative and qualitative techniques. Aside from understanding changes in the amount of *participation*, knowledge about the changes in the *participation* patterns/preferences of students should offer valuable new insight. Moreover, it is expected that changes in students' perceived *participation* constraints will be observed following a major life transition (Godbey et al., 2010), and that changes in students' motives and negotiation strategies will also emerge.

1.9. Significance of Study

There is limited research available on changes in *participation* following the *transition*, in particular changes in students' *participation* patterns and preferences, as well as changes in factors that influencing *participation* following the *transition*. Thus, from a theoretical perspective, this study may offer new insight to such changes and how changes in *participation* are influenced by changes in influencing factors.

Moreover, in the context of NZ, the relationships between *participation* and influencing factors have not yet been examined in great depth. It is hoped that this study will produce evidence to inform interventions and policy making that will maximise student *participation*. Maximising student *participation* is important because their behaviours affect personal health and well-being as well as their ability, as potential future leaders, to influence society and serve as role models (Keating, Guan, Piñero, & Bridges, 2005).

Insufficient physical activity within the NZ adult population over the past decade has been trending upwards, rising from 36% (McCully & Creech, 1999) to 48% (Ministry of Health [MoH], 2014). In light of this trend, inroads need to be made when it comes to increasing New Zealanders' physical activity levels. This trend may be partially attributable to changes in society, such as technological advancements and the ever increasing range of sedentary leisure options. However, this trend might also be attributable to policy. For example, the decrease in physical activity has coincided with: physical activity disappearing from the NZ Health Strategy (MoH, 2016a), having previously been one of the NZ Government's key population health objectives (MoH, 2000); and, an apparent shift in the focus of the Governing body responsible for sport and recreation from being 'the most active nation' (SPARC, 2003) to being 'the world's most successful sporting nation' (Sport NZ, 2015c).

Getting children active is a focus of the NZ Government, as demonstrated by their investment in programmes, projects, initiatives, and plans such as *KiwiSport*, *Sport in Education*, *Play.sport* and the *Young People Plan* (Coleman, 2016; Sport NZ, 2015a, 2015d, 2016). Young adulthood physical activity habits are likely to be important influencers on habitual physical activity during adult life and, accordingly, have significant implications for individuals' long-term health (Leslie, Sparling, & Owen, 2001). Thus, it is surprising that the relevant Government departments and agencies appear to have largely ignored the opportunity to protect their investment by insuring that the marked reduction in *participation* that occurs during the transition from adolescence into adulthood (Cullen et al., 1999; Gordon-Larsen, Nelson, & Popkin, 2004; Simons et al., 2015) is avoided or minimised.

Tertiary institutions offer an ideal environment in which to conduct research and trial initiatives to get young New Zealanders active (Ferrara, 2009), because most school leavers pursue a tertiary education immediately upon leaving secondary school (Ministry of Education [MoE], 2016). By partnering with tertiary institutions, the Government could help get New Zealanders more physically active in a way that becomes habitual and part of one's lifestyle. A starting point to maximising student *participation* is an understanding of how *participation* changes following the *transition*, and what factors influence *participation*. By adopting a component mixed-methods cross-sectional design to explore changes in *participation* of first-year tertiary students

who have transitioned directly from secondary school to tertiary education within the context of a NZ university, this study contributes to the literature. Furthermore, the nature of the relationships between students' motives, negotiation strategies, and constraints and *participation* will be explored.

1.10. Thesis Outline

The remainder of this thesis is organised into six chapters. Chapter two is a review of the relevant academic literature relating to students' *participation*, motives, negotiation strategies, and constraints. Chapter three is a description of the Methods utilised in this study. Quantitative and qualitative results are both reported in chapter four. In chapter five, the findings of this study are interpreted, then compared and contrasted with the extant literature. Theoretical and practical implications and limitations of the present study are discussed, and future research recommendations are also made in this chapter. The sixth, and final, chapter brings this thesis to a close with a conclusion of the key findings and opportunities of this research.

Chapter 2: Literature Review

This chapter reviews the literature concerning student *participation* and the factors that influence student *participation*. The chapter is separated into six sections. The first section focuses on *participation*, and encompasses: *participation* and the *transition*; changes in student *participation* following the *transition*; the prevalence of insufficient student physical activity; and, relationships between socio-demographic variables and *participation*. The second section focuses on students' *participation* motives. It begins a review of motive measurement, followed by a review of the differences in motives for exercise and sport. Next, findings pertaining to students' motives for exercise, then sport, are reviewed separately, along with the respective findings relating to motive variation based on socio-demographic variables. The third section reviews the concept of negotiation, beginning with a review of negotiation measurement, which is followed by student negotiation research findings, and then the role of constraint anticipation in the negotiation process. Constraints are the focus of the fourth section, which begins with a review of the conceptual development of constraints theory (CT). Student CT-based and non-CT based *participation* constraint research findings are then reviewed separately. The fifth and sixth sections provide a summary of common limitations and future research recommendations within the literature, as well as a discussion of more unique limitations and specific recommendations.

2.1. Search Methods

Computer searches were conducted of the peer-reviewed literature in the English language. The following databases were searched: Academic Search Premier, Australia/New Zealand Reference Centre, Australian Public Affairs Full Text, ERIC, General OneFile, Google Scholar, Hospitality and Tourism Index, Humanities International Index, Index New Zealand, JSTOR, Linguistics and Language Behavior Abstracts, MEDLINE, MLA Bibliography, National Library of New Zealand Catalogue, NetLibrary, Periodicals Archive Online, Project MUSE - Standard Collection (2006), ProQuest Central (Legacy Platform), Psychology and Behavioral Sciences Collection, PsycINFO, Scopus, Social Sciences Citation Index, Social Services Abstracts, Sociological Abstracts, SPORTDiscus with Full Text, Web of Science, PubMed, NZ Research.org,

Science Direct, and A+ Education. Collections of theses were also searched on Australasian Digital Theses, Proquest Dissertations and Theses, and ScholarlyCommons@AUT. Manual searches were also conducted on the AUT and UC University Library catalogue search engines.

To ensure literature relevant to this thesis was not overlooked the standard Google search engine was also used to locate relevant NZ specific material. Combinations of keywords utilised during the searches were: physical activity, sport, exercise, participation, decline, decrease, reduction, change, students, tertiary, first-year, freshman, freshmen, undergraduate, motive, motivation, negotiation, constraint, barrier, and obstacle.

2.2. Participation

A considerable body of international literature exists concerning student *participation*. The following discussion reviews *participation* and the *transition*, more specifically the lifestyle changes that students experience through the *transition* that are likely to contribute to decreased *participation*. A review of findings relating to changes in *participation* following the *transition* follows. Next, findings related to the prevalence of insufficient student physical activity are reviewed, followed by a review of the relationships between socio-demographic variables and student *participation*.

Participation and the transition from secondary school to tertiary education.

Though physical activity tends to decline across the lifespan (Sport NZ, 2015b) the decrease is more pronounced during certain life transitions. Childhood and adolescence are typically the most active stages of one's life, however, as adolescents transition into adulthood there is a marked reduction in *participation* (Cullen et al., 1999; Gordon-Larsen et al., 2004; Simons et al., 2015). Leaving secondary school, for most, is associated with the transition from adolescence into adulthood. In today's society NZ secondary school leavers are presented with a variety of options, including: entering the workforce, pursuing further education, taking a gap year, etc. However, most NZ secondary school leavers opt to pursue a tertiary education, with 61% of leavers deciding to do so immediately in 2015 (MoE, 2016).

For most, the *transition* marks the movement from adolescence to young adulthood, and is a complex process that involves major, and potentially

overwhelming, lifestyle adjustments to one's living environment, social network, academic commitments, and relationships, etc. (Cheng, Cheng, Mak, & Wong, 2003; Gall et al., 2000; Terenzini et al., 1994). In addition to an increased focus on their studies, individuals are required to take on and balance personal responsibility for their physical, emotional, and financial well-being (Terenzini et al.). The period of time pursuing a tertiary education is characterised by the exploration of numerous alternative experiences, and is often influential in the adoption of an active lifestyle that can continue until the end of one's life (Öcal, 2014). Moreover, the transition from adolescence into adulthood is also a time when lifetime attitudes and patterns of behaviour become established (Cheng et al.). Thus, lifestyle decisions made by students during this period are likely to shape both their present and future well-being.

Changes in student participation following the transition. Due to the aforementioned lifestyle adjustments associated with the *transition* it is not surprising that there is also a significant reduction in *participation* following this period. In terms of NZ, to date only Sinclair et al. (2005) and Rogers (2016) have examined changes in *participation* following the *transition*. A decade ago Sinclair et al. reported that following the *transition* there was a significant reduction in students' moderate (32.5%) and vigorous (36.3%) physical activity, as well as sport club membership, with nearly half of respondents completely ceasing involvement with at least one club sport or recreation activity. More recently Rogers reported that 36% of students had decreased their participation in formal and informal sport and recreation activities following the *transition*.

A significant decrease in *participation* following the *transition* has been consistently reported in the international literature. In terms of cross-sectional studies, findings range from a 9.2% decrease in Americans' physical activity (Ullrich-French et al., 2013), to a 14.7% decrease in Canadians' physical activity (Kwan et al., 2009), and a 19.3% decrease in Canadians' vigorous physical activity (VPA) session frequency (Bray & Kwan, 2006). Likely due to the expense and difficulties associated with longitudinal research, very few longitudinal studies focusing on changes in student *participation* following the *transition* exist. Of the longitudinal studies published, Han et al. (2008) followed 69 American females during the *transition*, finding that their moderate-to-

vigorous physical activity (MVPA) decreased significantly (52.1%), with an associated narrowing of the variety of activities participated in. Van Dyck et al. (2014) found Flemish students' sport participation and active transportation (e.g. walking, cycling, etc.) decreased significantly following the *transition*, by 40% and 29% respectively. A similar study also reported Flemish students' sport participation decreased significantly for both males (43%) and females (68%) following the *transition* (Deforche et al., 2015). The decreases reported by longitudinal studies are greater than those reported by cross-sectional studies. This difference is likely attributable to *participation* measurement being more accurate in longitudinal studies compared to cross-sectional studies, which rely on retrospective measurement.

Aside from the decrease in *participation*, very little research exists concerning how students' *participation* patterns or preferences change following the *transition*. One study that offers such insights was conducted by Bloemhoff and Coetzee (2007), who assessed the prevalence of participation in sporting and physical activities, as well as the specific sporting codes participated in by third year South African students in relation to both the present and their retrospectively reported final year of secondary school. The number of participants who were physically active declined significantly, from 71.3% to 31.5%. There was also a considerable change in the activities participated in. Participation in more competitive and individual sporting activities decreased considerably, with recreational activities (e.g. exercising in gyms, jogging) and sports that can be played relatively informally (e.g. football and volleyball) increasing in popularity.

Quality research into NZ tertiary students' *participation* preferences and patterns does not yet exist. However, data reported by Sport NZ (2015b) does offer some insight into young New Zealanders' (16 to 24 year olds) participation habits. The data indicates that the most popular activities amongst young New Zealanders are walking, swimming, jogging/running, equipment-based exercises, cycling, netball, touch rugby, fishing, football, and dance. Preferences differ considerably between genders. Overall, men demonstrated a greater preference for team sports, compared to women who preferred group fitness type activities. According to the data, 77.1% of young New Zealanders had participated in one or more sport and recreation activities in the previous week, which was reduced to 64.8% when walking was excluded.

However, only 39.3% of young New Zealanders had taken part in at least one sport and recreation activity on five or more days of the previous week, suggesting a best case scenario of only 60% of young New Zealanders being insufficiently active, i.e. failing to meet the NZ MoH's recommendation of being physically active for 30 minutes on five or more days/week (MoH, 2016b). In addition, between 2007/2008 and 2013/2014 young New Zealanders' participation in one or more sport and recreation activity in the previous week declined by 2.3%, the only age group to demonstrate a decline. Moreover young New Zealanders' club or centre membership declined by 9%; sport club membership declined by 4%; and, gym membership remained relatively steady with a 0.4% decrease (Sport NZ). This demonstrates an overall decline in physical activity among young New Zealanders.

Studies examining changes in *participation* following the *transition* are limited in their generalisability to NZ, and by their use of self-reported measures. Moreover, the cross-sectional studies are further limited by potential recall bias concerning past and present levels of *participation*. The variety of *participation* measures used also makes comparison of findings between studies difficult. Regardless it is clear that *participation* declines considerably following the *transition*, leading to the prevalence of insufficient physical activity amongst students both following the *transition*, as well as throughout their time as a tertiary student.

Insufficient student physical activity. Likely attributable to the decrease in *participation* following the *transition*, the prevalence of insufficient physical activity amongst first-year tertiary students, and tertiary students in general, is relatively high. Again, to date only Sinclair et al. (2005) and Rogers (2016) have examined first-year NZ tertiary students' physical activity levels. Sinclair et al. reported that 60% were insufficiently active, and Rogers reported that just over one in four (27%) students who had completed the *transition* were inactive, i.e. did not participate in any sport or recreational activity. These findings are comparable to more recent reports concerning the general population of young New Zealanders (15 to 24 years), of whom 49.3% were classified insufficiently active in 2013/2014, which is a statistically significant ($p = .02$) increase of 5.7% since 2006/07 (MoH, 2014). In addition these findings, as well as those of the international studies that follow, neglect to account for the resistance training recommendations made by most national health agencies. Though

comparisons are complicated by physical activity guidelines variations, the prevalence of NZ students' insufficient physical activity reported by Sinclair et al. appears to be relatively high compared to levels of first-year students reported in the international literature (see Table 1), as well as students in general. The latter is reinforced by the considerable body of international literature published over the past decade (see **Appendix C**), which suggests that insufficient physical activity persists across a student's time pursuing a tertiary education.

Table 1: *First-year Tertiary Student Insufficient Physical Activity Study Findings*

Author(s)	Participants	Findings
Bray and Born (2004)	145 first-year Canadian science students completing the <i>transition</i>	Insufficient activity increased significantly, from 33.8% to 55.9%, following the <i>transition</i> ; and, 33.1% became insufficiently active following the <i>transition</i>
Bray and Kwan (2006)	175 first-year Canadian students completing the <i>transition</i>	39% were insufficiently active (males 37%, and females 43%)
Fontaine, Ligouri, Mozumdar, and Schuna Jr (2011)	736 first-year American students	56.5% were inactive or insufficiently active. Significantly more females (66.9%) were insufficiently active compared to males (50.3%)
Han et al. (2008)	69 first-year American female students completing the <i>transition</i>	The number failing to achieve the recommended level of physical activity increased significantly following the <i>transition</i> , doubling to 34.8%.
Gyurcsik, Bray, and Brittain (2004)	132 first-year American female students completing the <i>transition</i>	47% were classified as insufficiently active
Mohammed, Salmiah, Ariffin, and Kamaruzaman (2014)	894 first-year Malaysian students	41.4% were classified as insufficiently active, and the prevalence of physical inactivity was significantly greater in females (48%) compared to males (18.8%)
Pacheco, Santos-Silva, Gordia, de Quadros, and Petroski (2014)	716 first-year Brazilian students	Less than a third were adequately physical active, and females were half as likely to be physically active compared to males

Longitudinal studies indicate student physical activity stability is highly variable and very much based on the individual. For example, Pinto, Chericco, Szymanski, and Marcus (1998) examined the changes in American students' physical activity levels following the transition from their first year of study to their second. 41.3% of participants were sufficiently active at both time points, 21.9% were insufficiently active at both time points. Between years 12.8% became insufficiently active, and 16.9% became sufficiently active. More recently Irwin (2007) reported that 51% of Canadian undergraduates were categorised as active at baseline, but only 35% remained physically active after one month. In addition to demonstrating the variability in student physical activity levels, these findings also highlight the need to appreciate the time at which *participation* is measured.

Socio-demographic variables and participation. A range of socio-demographic variables influence student participation significantly. Gender in particular and ethnicity are the most widely analysed variables. Though less research exists, past participation, living situation, course and year of study, as well as other variables have also been reported to have a significant relationship with participation.

Most studies assessed participants' gender. Of those to test for gender differences amongst first-year students, only one reported no significant differences (Bray & Born, 2004), whereas three more recent studies reported that female students were significantly less active compared to males (Fontaine et al., 2011; Mohammed et al., 2014; Pacheco et al., 2014). Relative to their respective male counterparts: Fontaine et al. reported that significantly more American females were insufficiently active or inactive, Mohammed et al. reported that significantly more Malaysian females were physically inactive, and Pacheco et al. reported that Brazilian females were significantly less active and half as likely to be physically active. The diversity in the context of these studies demonstrates the impact of gender on physical activity regardless of culture or context.

In terms of students in general, females were significantly less active than males in all but one study to analyse gender differences. The study that reported a non-significant gender difference involved American athletic training students (Stanek, Rogers, & Anderson, 2015). Findings indicate that female American undergraduates are: significantly less active (Grubbs & Carter, 2002; K. Miller, Staten, Rayens, &

Noland, 2005; Suminski, Petosa, Utter, & Zhang, 2002), spend significantly less time lifting weights (Suminski et al.), and are significantly less likely to participate in intramural and informal sports (Kiger, 1996) than male undergraduates. Along similar lines, other studies also reported that female American students are significantly less active (Farren, 2014; McArthur & Raedeke, 2009), and are significantly less likely to use campus recreational facilities (CRFs) compared to males (K. Miller, Noland, Rayens, & Staten, 2008; Milton & Patton, 2011; S. Smith, 2011; Zizzi, Ayers, Watson II, & Keeler, 2004). Females were also reported to be significantly less active in a number of non-North American studies, including: Swedish business students (Schmidt, 2012), Bosnia and Herzegovinian undergraduates (Atikovic et al., 2014), United Kingdom (UK) students (Dodd, Al-Nakeeb, Nevill, & Forshaw, 2010), Chinese nursing undergraduates (Chan, 2014), Thai students (Nanakorn et al., 1999), and Egyptian students (El-Gilany, Badawi, El-Khawaga, & Awadalla, 2011). Other findings are less conclusive, and suggest that gender differences may be attributable to differences in specific types of physical activity and in some cases culture (Awadalla et al., 2014; Fagaras, Radu, & Vanvu, 2015; Pedišić, Rakovac, Bennie, Jurakić, & Bauman, 2014).

Participants' ethnicity was assessed in approximately half of the studies reviewed, some of which tested for significant differences in *participation* based on ethnicity, producing relatively mixed findings. Physical activity did not vary significantly in a number of studies involving: first-year Malaysian students (Mohammed et al., 2014), American athletic training students (Stanek et al., 2015), American female students (Minkel, 2010; S. B. Smith, 2007), and American undergraduates (K. Miller et al., 2008). In contrast, other studies reported significant differences. Several were conducted in the context of American tertiary institutions, and found that: Asian female undergraduates were less active compared to females of other ethnicities (Stanek et al., 2015), Caucasian undergraduates were significantly more active compared to students of other ethnicities (K. Miller et al., 2005), and African American students were significantly more active compared to students of other ethnicities (McArthur & Raedeke, 2009). Finally, two studies that examined the CRF usage amongst American students reported that Caucasian (S. Smith, 2011) and African American (Milton & Patton, 2011) students were significantly more likely to use CRFs compared to other students.

Cross-cultural studies have also revealed significant differences in *participation* based on ethnicity. A study involving students from Taiwan, Hong Kong, South Korea, Singapore, and Malaysia reported that physical inactivity varied between all countries except for Singapore and Malaysia (Seo et al., 2012). Another study that compared American, Omani, and Pakistani undergraduates' exercise levels reported that Omani and Pakistani undergraduates' exercise levels and frequency of thoughts of exercising were significantly lower than those of Americans (Li et al., 2015). This may be linked with the finding that American students had participated in significantly more organised sports compared to Omani and Pakistani students prior to tertiary study (Li et al.) given past *participation* has been linked with present *participation* in a number of studies (Crozier, Gierc, Locke, & Brawley, 2015; Kiger, 1996; Kwan et al., 2009; Wallace, Buckworth, Kirby, & Sherman, 2000; Zizzi et al., 2004).

A significant relationship between students' living situation and *participation* was reported by the small number of studies to examine this relationship, all of which involved American students. Five similar studies reported that on-campus residents were significantly more likely to use CRFs than those living elsewhere (Henchy, 2011; K. Miller et al., 2008; Milton & Patton, 2011; S. Smith, 2011; Zizzi et al., 2004). Moreover, S. Smith found CRF proximity had a significant relationship with CRF usage.

Significant differences have been reported in *participation* based on students' course and year of study. Irwin (2007) reported that Canadian undergraduates who maintained their level of physical activity over a four-week period were significantly more likely to be enrolled in a health-related academic discipline than the insufficiently active subjects. The findings of El-Gilany et al. (2011) both support and contradict Irwin's, in that Egyptian medical and physical education students were significantly more and less likely to be physically inactive compared to commerce students respectively. Being a medical student ($OR = 2.69$) was an independent predictor of physical inactivity amongst Saudi Arabian students (Awadalla et al., 2014), contradicting the findings of both Irwin and El-Gilany et al. Also, though not analysed statistically, Bosnian and Herzegovinian undergraduates' physical activity appeared to differ considerably based on course of study (Atikovic et al., 2014). Finally, Mraković, Hraski, and Loriger (2011) reported 19 to 22 year old Croatian students' sporting preferences differed significantly based on faculty.

In relation to year of study, Stanek et al. (2015) and S. Smith (2011) reported no significant differences in the physical activity of American athletic training students or CRF usage of American students respectively. In contrast, two studies involving American students reported that CRF users were significantly more likely to be first or second year students (K. Miller et al., 2008), and that significantly more graduate students had not used CRFs compared to undergraduates (Henchy, 2011). Finally, somewhat in contrast to the findings of American studies, Pedišić et al. (2014) found that Croatian students' leisure time physical activity (LTPA) was positively associated with year of study.

Other studies have examined the relationship between physical activity levels and health related behaviours, employment status, socio-economic status (SES), and relationship status. In the case of health related behaviours, physical activity, or lack thereof, has been linked with mental health (Mohammed et al., 2014; Seo et al., 2012), dietary behaviours (Seo et al.), and smoking (Pedišić et al., 2014; S. Smith, 2011; Zizzi et al., 2004). As far as employment status, Malaysian students who worked more 20hrs/week were significantly (twice) as likely to be physically inactive compared to those who worked less than 20hrs/week (Seo et al., 2012). In relation to SES, the prevalence of physical inactivity was significantly greater amongst first-year Malaysian students from families with lower levels of income (62.7%) compared to those from more affluent families (26.9%) (Mohammed et al., 2014). With respect to relationship status, single American students were reported to be significantly more likely to use the CRFs (K. Miller et al., 2008), whereas Schmidt (2012) reported that Swedish Business students' physical activity did not vary based on relationship status.

In summary, *participation* is influenced by a range of factors, including one's personal characteristics, knowledge, attitudes, and beliefs (Chan Sun & Azmutally, 2013). A complete understanding of students' initiation and continuation of *participation* following the *transition* requires investigation of all of the factors that influence decisions related to *participation*, both positive, and negative (Jackson, 2000). Psychological factors that influence student *participation* (motives, negotiation strategies, and constraints), and their relationship with both *participation* and various socio-demographic variables are reviewed in the subsequent sections of this chapter.

2.3. Motives

“Wanting or needing to do something does not mean that people, in fact, do it” (Hubbard & Mannell, 2001, p. 159). Though motivation may not influence *participation* directly (Hubbard & Mannell), it is an important psychological variable that determines both the initiation and continuation of *participation* (Rintaugu & Ngetich, 2012). Understanding students’ *participation* motives is an antecedent to understanding changes in *participation*, (Rintaugu & Ngetich), and is thus key to increasing student *participation* (Egli, Bland, Melton, & Czech, 2011).

For the most part the student *participation* motives literature is not explicitly based on a theoretical framework (see for example Kilpatrick, Hebert, and Bartholomew, 2005). However, aspects of Self-Determination Theory (SDT) are evident in the findings of most studies. SDT is reflected in the presence of motives that resemble the psychological needs for competence, autonomy, and relatedness (Deci & Ryan, 2000). Moreover, research findings support SDT’s assumption that motives occur on an intrinsic-to-extrinsic continuum (Lauderdale, Yli-Piipari, Irwin, & Layne, 2015; Markland & Ingledew, 1997).

To the best of the author’s knowledge, no research exists on NZ students’ motives. The closest research available is data reported by Sport NZ (2015b). The data indicates that for almost all NZ adults, fitness and health (90.7%), and enjoyment (87.9%), were the key reasons, i.e. motives, for taking part in physical activities. Other common reasons included social reasons (52.9%), low cost (44.5%), convenience (43.5%) and sport performance (31.1%). Reasons varied in importance between genders. Enjoyment, social reasons and sport performance were of greater importance to men; whereas of greater importance to women were fitness and health, low cost, and convenience (Sport NZ).

Fortunately there is a considerable body of international literature concerning students’ *participation* motives that is reviewed in the following section, which begins with a review of motives measurement. A review of the differences in motives for exercise and sport follows, before student motives for exercise and sport, along with the associated findings pertaining to variation in motives based on socio-demographic variables are reviewed separately. Finally, the relationships between motives, negotiation, and *participation* are discussed.

Motives measurement. Student *participation* motives have been measured using a variety of instruments and data collection procedures. The most commonly used student *participation* motives measure is the Exercise Motivation Inventory-2 (EMI-2), of which versions have been used by more than a dozen studies. Several studies have also used the Leisure Motivation Scale (LMS) to measure North American students' sport participation motives. Other studies have measured motives using a range of previously validated scales, self-developed instruments, and qualitative procedures.

Exercise versus sport motives. For the most part studies concerning student *participation* motives can be separated into those focused on exercise motives, i.e. physical activity, in general, and those focused specifically on sport participation motives. Limited research exists on differences in students' exercise and sport motives. In fact only two studies, one involving American health and kinesiology students (Kilpatrick, Hebert, & Bartholomew, 2005) and the other involving active Filipino students (Cagas, Manalastas, Torre, & Sanchez-Pituk, 2015), both of which used versions of the EMI-2, have examined this difference. Results from both studies revealed that exercise and sport motives differed significantly. Intrinsic motives, such as enjoyment and affiliation had a greater association with sport; whereas extrinsic motives such as appearance and weight-management had a greater association with exercise. The following review separates those studies focused on exercise motives and those focused on sport motives. Emergent trends are discussed, along with socio-demographic variations in motives.

Exercise motives. The vast majority of studies report health, strength and endurance/fitness, appearance, weight management, and ill-health avoidance as the most important student exercise motives. This is despite studies using a variety of measures and involving students from varying contexts. Motives were assessed using: the EMI-2 (Boren, 2014; Egli et al., 2011; Guedes, Legnani, & Legnani, 2013; Kulavic, Hultquist, & McLester, 2013; Ledford, 2013; Meyer & Bevan-Dye, 2014; Pauline, 2013; Roberts, Reeves, & Ryrie, 2015), other instruments (Cowie & Hamilton, 2014; Hall, Kuga, & Jones, 2002; McArthur & Raedeke, 2009; Turke, 2012; Yoh, 2009), and qualitative procedures (Chan Sun & Azmutally, 2013; Ebben & Brudzynski, 2008). Though most studies were conducted in American institutions (Boren; Ebben &

Brudzynski; Egli et al.; Hall et al.; Kulavic et al.; Ledford; McArthur & Raedeke; Pauline; Turke; Yoh), studies from Australia (Cowie & Hamilton), Brazil (Guedes et al.), Mauritius (Chan Sun & Azmutally) South Africa (Meyer & Bevan-Dye) and the UK (Roberts et al.) are also included.

Socio-demographic differences in exercise motives. Student exercise motives have been shown to vary based on a range of socio-demographic variables, including: age, gender, ethnicity, exercise levels, etc. Though age was assessed by nearly all studies, only three studies, which each used a version of the EMI-2, examined whether motives varied based on age. Despite using the same measure, results from the studies involving American (Egli et al., 2011) British (Roberts et al., 2015), and Brazilian students (Guedes et al., 2013) were inconsistent. This suggests that there might be an interaction between culture and age in relation to exercise motives.

Clear gender differences in student exercise motives emerged from the literature. In general, males tended to report greater competition, social, and fitness motives; whereas females tended to report greater body and health related motives. A number of studies using EMI-2 versions examined whether motives varied between genders, including those conducted in the context of American (Egli et al., 2011; Li et al., 2015; Pauline, 2013; Pope & Harvey, 2015), Brazilian (Guedes et al., 2013; Junior et al., 2015), South African (Meyer & Bevan-Dye, 2014), UK (Roberts et al., 2015), Omani, and Pakistani (Li et al.) tertiary institutions. Results indicate that affiliation (Egli et al.; Junior et al.; Pauline; Roberts et al.), challenge (Egli et al.; Meyer & Bevan-Dye; Pauline; Roberts et al.), competition (Egli et al.; Guedes et al.; Junior et al.; Li et al.; Meyer & Bevan-Dye; Pauline; Roberts et al.), enjoyment (Egli et al.; Meyer & Bevan-Dye; Roberts et al.), strength and endurance (Egli et al.; Guedes et al.; Li et al.; Meyer & Bevan-Dye; Pauline; Roberts et al.), social recognition (Egli et al.; Junior et al.; Li et al.; Pauline; Roberts et al.), and in one instance revitalisation (Roberts et al.) are significantly greater motives for males compared to females. In contrast, compared to males, females reported significantly greater weight management (Egli et al.; Guedes et al.; Junior et al.; Li et al.; Meyer & Bevan-Dye; Pauline; Pope & Harvey; Roberts et al.), appearance (Egli et al.; Guedes et al.; Li et al.; Meyer & Bevan-Dye; Pauline; Roberts et al.), positive health (Egli et al.; Meyer & Bevan-Dye; Pauline), ill-health avoidance (Egli et al.; Meyer & Bevan-Dye) and stress management (Pauline) motives.

Results of several studies using measures other than the EMI-2 support those above. Firstly, a study involving American students found females placed significantly more importance on appearance and mental health motives compared to males (McArthur & Raedeke, 2009). In addition, a qualitative study involving Mauritian students found that females commonly referenced motives related to weight loss and slim appearance attainment, whereas for males strength and building muscle were top motives (Chan Sun & Azmutally, 2013). Finally, Hall et al. (2002) also reported female students' weight control motives to be considerably greater than males', for whom enjoyment and attractiveness, in contrast to the EMI-2 studies, were significantly more important. Conflicting findings were also reported by EMI-2 studies, with some reporting health pressures (Egli et al.; Pauline) and nimbleness (Egli et al.; Li et al.) as significantly more important for males compared to females; whereas Meyer and Bevan-Dye reported the opposite for health pressures, and Pauline the opposite for nimbleness.

Only two studies examined whether motives varied based on ethnicity (Egli et al., 2011; Li et al., 2015). Both found significant, but very complex differences.

A number of studies examined whether students' exercise levels had a relationship with motives, and in each case found significant differences between active and less active/inactive students. Overall findings are relatively inconsistent with the exception of health related motives, which were reported as greater in several studies (Downes, 2015; Junior et al., 2015; McArthur & Raedeke, 2009). These studies involved Brazilian undergraduates (Junior et al.) and American students (Downes; McArthur & Raedeke). Ledford (2013) also reported significant differences in the motives of African American female students based on activity levels. Collectively, findings suggest an interaction between activity levels and other variables, such as the context, and perhaps culture and gender, to influence motives.

Finally, differences in student exercise motives based on year of study and SES have also been examined. Motives did not differ significantly based on year of study (Pauline, 2013). In contrast, Brazilian undergraduates' motives tended to be higher in those from higher SES families. However, differences were only statistically significant in relation to weight management and physical appearance when comparing the highest SES students with the lowest (Guedes et al., 2013).

Sport motives. Most studies that examined students' sport participation motives reported enjoyment as the top motive (Ciuffo, Johnson, & Tracy, 2014; Cooper, Schuett, & Phillips, 2012; Houselog, 2014; Mirsafian, Mohamadinejad, Homaei, & Hédi, 2013; Rintaugu & Ngetich, 2012). Social motives were also frequently mentioned in the top three (Beggs & Elkins, 2010; Beggs, Elkins, & Stitt, 2004; Beggs, Nicholson, Elkins, & Dunleavy, 2014; Ciuffo et al.; Cooper et al.; Houselog; Iso-Ahola & Allen, 1982; Kanters & Forester, 1997; Wood, 2011). Competency related motives, such as those associated with fitness, challenge, competition, and social recognition were ranked highly (Beggs & Elkins; Beggs et al.; Beggs et al.; Ciuffo et al.; Cooper et al.; Houselog; Iso-Ahola & Allen; Kanters & Forester; Morales, 2009; Wood). Stimulus-avoidance motives, such as stress management and revitalisation were also revealed to be important by multiple studies (Beggs & Elkins; Beggs et al.; Beggs et al.; Kanters & Forester; Kondrič, Sindik, Furjan-Mandić, & Schiefner, 2013; Mirsafian et al.; Morales; Wood). Like exercise motive studies, the consistency of findings is surprising given the variation in measures and contexts. Most studies were conducted in the context of American institutions (Beggs & Elkins; Beggs et al.; Beggs et al.; Ciuffo et al.; Cooper et al.; Houselog; Iso-Ahola & Allen; Kanters & Forester; Morales), but studies were also conducted in Canada (Wood), Iran (Mirsafian et al.), Kenya (Rintaugu & Ngetich), Croatia, Germany, and Slovenia (Kondrič et al.).

Socio-demographic differences in sport motives. Student sport participation motives have been shown to vary based on socio-demographic variables, including: age, gender, ethnicity, course and year of study, as well as sport participation levels and preferences. Only two studies tested for differences in sport motives based on age. One involving American students reported no significant differences (Cooper et al., 2012). The second, involving Iranian students, reported a number of significant differences between Iranian students of different age bands (Mirsafian et al., 2013).

Gender was the most frequently analysed variable in relation to sport motives, yet findings are relatively inconsistent. Only one study reported no significant differences, in this case in the motives of German students (Kondrič et al., 2013). The same study also reported that compared to the opposite gender excitement was significantly greater for Slovenian males, and that relaxation and meeting friends were significantly more important for Croatian females (Kondrič et al.). Two studies that

used the LMS reported significant differences in motives between genders (Beggs et al., 2004; Kanters & Forester, 1997). The first reported that intellectual, social, and stimulus-avoidance motives were significantly greater for American female undergraduates compared to males (Beggs et al.). Similarly, Kanters and Forester reported that American female intramural participants were significantly more motivated by stimulus-avoidance motives. Similar to Beggs et al., another study that examined American students' intramural participation motives found females were more motivated by all motives, significantly so by appearance and social motives (Cooper et al., 2012). A further two studies involving American intramural sport participants reported relatively similar findings. Morales (2009) found that challenge and physical fitness motives were significantly greater for females, and that all other motives were greater for females except for self-esteem and competition. Ciuffo et al. (2014) also reported females' fitness motives were significantly greater. In contrast to the findings of American studies, an Iranian study reported that physical and mental health maintenance and having a fit body were significantly greater motives for males, whereas spending leisure time, reducing stress, and being with friends were significantly greater for females (Mirsafian et al., 2013). Several other studies reported considerable gender differences that did not reach statistical significance (Houselog, 2014; Iso-Ahola & Allen, 1982; Rintaugu & Ngetich, 2012).

Students' sport participation motives have also been shown to vary significantly based on participation levels and preferences (Beggs et al., 2004; Beggs et al., 2014; Kiger, 1996; Webber & Mearman, 2009). Most of these studies concerned American students. Kiger reported that extrinsic and intrinsic motives had a significant positive influence on intramural participation levels, and that intrinsic motives has a significant positive influence on informal recreational sport participation levels. A more rigorous study involving undergraduates which measured motives using the LMS reported significant differences between the motives of regular participants in campus recreational sport (CRS) activities and non-regular participants (Beggs et al., 2004). Non-regular participants were significantly more likely to be motivated by intellectual and stimulus-avoidance motivations. Regular participants were more likely to be motivated by competency-mastery variables such as competition and challenge. Social variables did not differ significantly based on participation. Finally, a similar study that

also used the LMS reported significant differences in stimulus-avoidance motives based on activity type. Aquatic, group fitness, and informal workout participants were significantly more motivated by stimulus-avoidance factors than intramural sports participants. In addition, aquatic participants were significantly more motivated by stimulus-avoidance factors than participants in informal sports (Beggs et al., 2014). A small study involving British students reported two interesting findings that link participation levels with motives. These were that the number of sports participated in had a significant relationship with the motive of new friends; and, that if one's partner participated in the same sports they are likely to participate in more sports (Webber & Mearman).

Motives, negotiation, and participation. As mentioned in chapter one, the relationship between motives and *participation* is a point of contention between constraints negotiation process researchers. The division between researchers concerns whether this relationship is partially (Loucks-Atkinson & Mannell, 2007; White, 2008; Wilhelm Stanis et al., 2009) or fully (Covelli et al., 2007; Hubbard & Mannell, 2001; Son, Kerstetter, et al., 2008; Son, Mowen, et al., 2008) mediated by negotiation. There are a number of explanations for the division. The main explanation is the measurement of variables (motives, negotiation, and participation, as well as constraints) which, aside from having their own limitations, vary considerably between studies. Moreover, other variables may also influence the relationship. For example, Son, Kerstetter, et al. reported that, when controlling for age and gender, motivation was directly and indirectly related to overall LTPA, but only indirectly related to LTPA frequency. For a more in depth review of negotiation literature, see Guo (2012).

2.4. Negotiation

Jackson et al. (1993) proposed that participation is dependent not on the absence of constraints (although this may be true for some), but on their negotiation, which may modify rather than prevent participation. Jackson et al. made this proposition, along with several others, in an article that formalised and extended the concept of negotiation implicit in earlier articles (Crawford & Godbey, 1987; Crawford et al., 1991) following existing evidence that individuals were employing strategies to alleviate leisure constraints (Kay & Jackson, 1991; Scott, 1991; S. M. Shaw, Bonen, &

McCabe, 1991). Jackson et al.'s balance proposition is particularly pertinent to this study as it explicitly incorporated motivation into the constraint negotiation process, stating that "both the initiation and outcome of the negotiation process are dependent on the relative strength of, and interactions between, constraints on participation in an activity and the motives for such participation" (Jackson et al., p. 9). Introducing motives into the equation enables the response to constraints to be viewed as a function of the interaction, or balance, between constraints and one's motives. Furthermore, the balance proposition is consistent with the social exchange portrayal of the negotiation process as decision-making conflict between rewards (motives) and costs (constraints).

The following section begins with a brief overview of negotiation measurement and the development of instruments. Student negotiation research findings are then reviewed. Finally, an overview of two of Jackson et al.'s (1993) other key propositions concerning constraint anticipation is provided.

Negotiation measurement. Negotiation has been measured using a range of instruments traceable to Jackson and Rucks' (1995) study. Jackson and Rucks were the first to explicitly investigate leisure constraints negotiation, following Jackson et al.'s (1993) propositions, in a qualitative exploratory study on adolescent's negotiation strategies pertaining to successful initiation or continuation of leisure participation. Jackson and Rucks found that behavioural negotiation strategies were most commonly used, and that cognitive strategies were also used. Other qualitative studies' findings have also supported this classification (Little, 2002; Samdahl & Jekubovich, 1997).

Jackson and Rucks' (1995) findings supported Jackson et al.'s (1993) proposition that negotiation strategies can be separated in to either cognitive strategies, such as putting up with and/or ignoring constraints etc., or behavioural strategies. Though nearly all subsequently developed empirical negotiation measures can be traced to Jackson and Rucks' study, few have included cognitive negotiation strategies. Instead researchers have mainly focused on the measurement of behavioural strategies. Moreover, the development of a quality, reliable, valid and theoretically underpinned negotiation measure using rigorous procedures would appear to have not yet taken place.

Student negotiation. In relation to research concerning the student *participation* constraint negotiation: time management, interpersonal coordination, and skill acquisition categories have commonly been included (Beggs, Elkins, & Powers, 2005; Elkins, Beggs, & Choutka, 2007; Guo & Scheider, 2015; Wood, 2011; Wood & Danylchuk, 2015; Yerlisu-Lapa, 2014). Several studies included a financial management category (Beggs et al.; Elkins et al.; Guo & Scheider; Yerlisu-Lapa); a few included physical fitness and intrapersonal validation categories (Beggs et al.; Elkins et al.; Yerlisu-Lapa); and one study reviewed included cognitive strategies, along with issue management strategies (Guo & Scheider).

Beggs et al. (2005) conducted the first quantitative study by drawing upon the research of Jackson and Rucks (1995) and Hubbard and Mannell (2001) to develop an instrument to measure negotiation strategies used by American undergraduates to participate in CRS. Elkins et al. (2007) subsequently used the scale to assess the strategies used by American students to participate in CRS. In both studies interpersonal relations were the most frequently employed strategies, followed by skill acquisition, and physical fitness strategies. Time management was the fourth most frequently employed strategy, followed by financial management, then intrapersonal validation strategies (Beggs et al.; Elkins et al.). Beggs et al. also assessed whether students' negotiation strategies varied based on socio-demographic variables, finding no significant differences based on year of study or living situation, but that 15 of the 31 items differed significantly between genders. Males used interpersonal relationship management and financial management strategies significantly more, and intrapersonal strategies significantly less, compared to females.

Two similar studies examined the constraint negotiation process for participation in intramural sport in samples of Canadian undergraduates engaged in intramural sports. Time-management strategies were the most frequently employed by participants, followed by skill acquisition and interpersonal strategies (Wood, 2011; Wood & Danylchuk, 2015). A limitation of these studies was the restriction of the negotiation instrument to only three factors, and the absence of factor analysis (FA). Rintaugu, Mwangi, and Bailasha (2013) used an instrument based on those used by Hubbard and Mannell (2001) and Wood (2011) to investigate Kenyan student football players' negotiation in relation to participation in football. Similar to Beggs et al. (2005)

and Elkins et al. (2007), interpersonal strategies were the most frequently employed, followed by time management and financial management strategies. Rintaugu et al. also assessed a range of socio-demographic variables, which had weak associations with negotiation strategies.

Other studies involving students have been conducted more recently to address some of the existing limitations of negotiation measurement, but did not report the item or category/factor means (Guo & Scheider, 2015; Yerlisu-Lapa, 2014). Finally, what could be classified as negotiation strategies also emerged from several other student-focused studies (Frederick & Shaw, 1995; Nolan & Surujlal, 2011; Rintaugu et al., 2013). The varying contexts in which student negotiation research has been conducted makes drawing definitive conclusions difficult. Though negotiation appears to vary between individuals, in general it appears that interpersonal, time management, skill acquisition, and physical fitness are the most frequently employed strategies. Also, comparison of findings between studies concerning students in general (Beggs et al., 2005; Elkins et al., 2007) and active participants (Wood, 2011; Wood & Danylchuk, 2015) suggest that interpersonal strategies may be more important for students in general, and time management strategies for active participants.

Constraint anticipation. Two of Jackson et al.'s (1993) propositions concerned the anticipation of constraints, and more specifically how anticipation could act as an antecedent constraint, and/or inform constraint negotiation. Firstly, Jackson et al. suggested that anticipation of interpersonal and/or structural constraints may effectively function as an intrapersonal (antecedent) constraint, and suppress the desire to participate. Antecedent constraints may also influence negotiation efforts, as a lack of desire (interest) in negotiating constraints may stem from genuine disinterest, satisfaction with present participation, or the effects of antecedent constraints (Witt & Goodale, 1981). Moreover, a lack of desire to change one's leisure behaviour may be a result of the previous perception, experience, and/or negotiation of an interpersonal and/or structural constraint that no longer has an influence, and is therefore not reported. Thus, Jackson et al.'s posit that past successful negotiation of structural constraints may partially explain the absence of desire to change present behaviours. Evidence confirming the influence of anticipated constraints is limited due to the

limited qualitative research conducted to date. Henderson, Bedini, Hecht, and Schuler (1995) published one of the few studies to report such findings, reporting that anticipation of one or more leisure constraints by women with disabilities sometimes altered their desire, unless they were confident in their ability to successfully negotiate the constraint. This leads to Jackson et al.'s second proposition regarding constraint anticipation.

Jackson et al. (1993) proposed that anticipation consists of both the constraint's presence or intensity, and the ability to negotiate it. Moreover, Jackson et al. added that anticipation of potential constraints is likely to lead individuals to implicitly assess their ability to adapt to, minimise, or remove them. As such, knowledge of and ability to adopt various negotiation strategies plays an important role in negotiation. Various researchers have categorised typologies for individuals based on their response to constraints (Henderson et al., 1995; Henderson & Bialeschki, 1993; Jackson et al.; Kay & Jackson, 1991). The simplest categorisation is that put forward by Kay and Jackson: (1) non-participants (passive or reactive responders) who accept constraints and make no attempt to negotiate them; (2) altered-participants (attempters, or partly proactive responders) are those who attempt to negotiate constraints and participate in an altered manner; or, (3) participants (achievers, or proactive responders) are those who do not change their participation at all despite encountering constraints. Henderson and Bialeschki, who also put forward a typologies framework for leisure constraints negotiation, outlined more complex/in depth typologies. This framework incorporated social exchange theory, where individual's negotiation efforts are suggested to range on an active-to-passive continuum depending on the perceived benefits or costs of participation.

2.5. Constraints

Constraints are factors, perceived or experienced by individuals, that inhibit or limit leisure participation and/or enjoyment (Jackson, 2000). Constraints are specific to each individual (Young, Ross, & Barcelona, 2003) who perceives/experiences constraints in varying intensities and in unique combinations (Jackson). Moreover, constraints are related to both the activity and the context (Young et al.). Thus, importantly, Godbey et al. (2010) noted that constraints are dynamic and change over

time; and, that the relative strength and importance of constraints varies significantly depending on the social, cultural, and historical context. Literature concerning student participation constraints can be separated into studies that have used constraints theory (CT) as a theoretical framework, and those that have not. The following section reviews the development of CT. Student *participation* constraints research is also reviewed, including studies both underpinned and not underpinned by CT.

Constraints Theory. CT has gone through a series of conceptual developments since its initial conception. The original model, proposed by Crawford and Godbey (1987), introduced a conceptual framework of constraints that centred around three theoretical constructs, or categories, of constraints: intrapersonal (individual), interpersonal, and structural (contextual). The original model was concerned with explaining the relationship between constraints and leisure activity preferences and subsequent leisure participation. Constraints were perceived as antecedent factors that shaped preferences (intrapersonal), related to both preferences and participation (interpersonal), or intervened in the preference-participation relationship (contextual). The original model was subsequently extended, beginning with the integration of constraints into a hierarchical model. Crawford et al. (1991), proposed a model that integrated the constraints put forward by Crawford and Godbey, arranging them in a hierarchy (from intrapersonal to structural). This hierarchy also reflects the importance of constraints. In this model individuals must negotiate constraints sequentially from the most proximal (intrapersonal) to the most distal (structural) in order to participate. Subsequently, the theoretical construct of constraints negotiation was first formally introduced by Jackson et al. (1993).

Further to the definitions provided in the Glossary of Terms, there are a number of important aspects to appreciate concerning the intrapersonal, interpersonal, and structural constraints. Intrapersonal constraints concern the relationship between constraints and preferences (Crawford & Godbey, 1987), which is critical as the failure to develop preferences is ultimately likely to constrain *participation*. This is ironic, as one must overcome intrapersonal constraints to develop a preference (Alexandris & Carroll, 1997a). Next, interpersonal constraints may interact with one's preferences, as well as one's subsequent participation, and may be

influenced by intrapersonal constraints due to an inability to find suitable partners to participate with (Crawford & Godbey).

Research findings in the decades since the proposition of earlier versions of CT have facilitated the review and clarification of some conceptualisations by CT's original authors. Early CT iterations implied constraints were encountered and negotiated linearly, beginning with intrapersonal constraints. This was based on the assumption that, without negotiating intrapersonal constraints, the desire or preference for an activity would either not develop or it would disappear or reduce (Crawford et al., 1991). However in their review of CT, Godbey et al. (2010) suggested that the hierarchical model be instead interpreted as circular and dependent on one's stage in life, which is influenced by a number of personal parameters such as one's: attitudes, interests or stage/level of participation, related knowledge and skills, location in relation to accessible facilities, social network, cultural background etc. Furthermore, due to the inherent variability of personal parameters, Godbey et al. noted constraints will continue to evolve as people move through life. For example life transitions, such as the *transition*, will likely see significant changes in perceived constraints (Jackson, 2000). Additionally, constraints are dependent on other personal and social factors, such as gender, ethnicity, socio-economic status etc. (Jackson).

Student constraints research. The student *participation* constraint literature can be separated into studies that are, and are not, underpinned by CT. Thus, CT-based and non-CT based research is reviewed separately.

Constraints Theory based research. There is a consensus within the international CT-based literature that, regardless of socio-demographic characteristics or the type of physical activity, the primary student *participation* constraints tend to revolve around a lack of time; mainly due to studies, work, or family, and to a lesser extent other leisure activities (Alfadhil, 1996; Chan Sun & Azmutally, 2013; Chung, Liu, & Chen, 2013; Qianyu & Ross, 2014; Shifman, Moss, D'Andrade, Eichel, & Forrester, 2011; Young et al., 2003). Other important constraints perceived by students are: a lack of pertinent knowledge or information (Masmanidis, Gargalianos, & Kosta, 2009; Young et al.); a lack of partners to participate with (Alfadhil; Chung et al.; Hashim; Shifman et al.); and, access to facilities and quality services (Hashim; Masmanidis et al.; Qianyu & Ross).

The CT-based literature can be separated into studies based on the 3-factor model of constraints, and those based on multiple-factor models of constraints. A small group of those who assessed constraints using multiple-factor models have taken the analysis a step further by comparing competing models of constraints (Casper, Bocarro, Kanters, & Floyd, 2011; Chung et al., 2013; Masmanidis et al., 2015). The review of the student CT-based literature begins with the 3-factor model research. A review of the multiple-factor model research, including the findings concerning the competing models follows.

3-factor model research. Raymore, Godbey, Crawford, and von Eye (1993) developed the first empirical constraint measure to test the proposed hierarchical model of leisure constraints (Crawford & Godbey, 1987; Crawford et al., 1991). Data collected from a sample of 363 Canadian secondary school students (12th graders) concerning new leisure activity initiation constraints was analysed using confirmatory factor analysis (CFA). This produced three factors: intrapersonal, interpersonal, and structural constraints. Multiple student-focused studies since have used 3-factor constraint instruments similar, if not the same, as Raymore et al.'s (Alfadhil, 1996; Hashim, 2012; Minkel, 2010; Qianyu & Ross, 2014; Shifman et al., 2011; Wood, 2011; Wood & Danylchuk, 2015; Young et al., 2003; Yusof & Shah, 2007). However, the findings of this research should be interpreted with caution for several reasons. Firstly, only Alfadhil (1996) tested the instrument's underlying factor structure using CFA, and encountered major issues in that the proposed model did not fit the data. In addition, the original instrument was developed in 1993 to measure Canadian secondary school students' leisure constraints, but has subsequently been used in studies concerning the *participation* constraints of tertiary students from various cultures who live in a vastly different society from 1993 (for example see Yusof & Shah, 2007). Finally, Raymore et al. (1993), of whom some had proposed CT, had a vested interest in proving their theory, which may explain their decision to use CFA rather than exploratory factor analysis (EFA) in what should normally have been an exploratory study.

The majority of research concerning student *participation* constraints has been conducted within the context of North American tertiary institutions. Alfadhil (1996) examined the constraints to participation in recreational sports activities of 144

American students who were non-regular participants, and the constraints to further participation in another 96 regular participants who wished to participate more. This is one of the few studies to have collected data from, and examined differences between, both participants and non-participants. Findings confirmed the existence of intrapersonal, interpersonal, and structural constraints, as identified by the hierarchical model, however the existence of further types of constraints was not ruled out. CFA was attempted but unsuccessful, potentially due to the small sample size. Eventually an acceptable CFA fit was achieved after deleting 19 of the original 30 items and reclassifying some of the remaining 11. Alfadhil also examined the relationship between gender and constraints. Constraints and the expression of interest in participation did not differ significantly between genders in non-participants. However, female regular participants appeared to be constrained significantly more by: low energy; a lack of partners; social and cultural norms; and, the inappropriateness of additional activities. The greatest perceived constraints to further participation were time, partners, information, facilities' crowdedness, fatigue, money, and motivation.

A similar, larger, study by Young et al. (2003) examined the CRS participation constraints of 416 American students identified as non-participants. The greatest constraints were a lack of time because of work, school or family; a lack of knowledge of available activities; and, a lack of time due to other leisure activities. Other considerable constraints included: a lack of partners, accessibility (transport), a lack of money, crowded facilities, a lack of motivation, and a lack of skills. Like Alfadhil (1996), Young et al. examined constraint variations based on gender, as well as age and living situation. Analysis revealed most non-participants were female, older, and lived off-campus. No significant gender specific differences were reported. Nevertheless, some constraints appeared to be more important to females' non-participation, including: self-consciousness, a lack of motivation, activities being dominated by a specific gender, and a lack of time because of work, school or family. Constraints also varied significantly based on age and living situation.

The studies conducted by Alfadhil (1996) and Young et al. (2003) remain two of the most comprehensive completed on student *participation* constraints. Many subsequent studies have neglected to examine the relationships between constraints

and socio-demographic variables (e.g. Stanek et al., 2015), let alone participation levels (e.g. Minkel, 2010).

Some cross-sectional studies have examined whether *participation* constraints vary between international (mainly Asian) and domestic North American students (Hashim, 2012; Shifman et al., 2011). Shifman et al. found that, compared to their domestic counterparts, intrapersonal, interpersonal, and structural constraints were significantly greater for international intramural sport participants; whereas only intrapersonal constraints were significantly greater for international non-intramural participants. Hashim, who did not differentiate based on participation, also found that intrapersonal and interpersonal, but not structural, constraints to CRS participation were significantly greater for international students compared to their domestic counterparts.

Besides from indicating that international students are significantly more constrained, in particular by intrapersonal constraints, compared to domestic students, the variation in the relative importance of the constraints reported by Hashim (2012) Shifman et al. (2011) Qianyu and Ross (2014) demonstrates how context specific some constraints can be despite the use of nearly identical measurement instruments. For example, both Shifman et al. and Qianyu and Ross found that time was the greatest constraint. However, Qianyu and Ross, unlike Shifman et al., reported that students did not perceive a lack of skills or shyness as important constraints, and that inconvenient transportation was a large constraint. Finally, Qianyu and Ross' participants appeared to know about the services and facilities available, whereas a lack of information or knowledge was one of the most important constraints in the other studies (Hashim; Shifman et al.). Collectively, the findings of these three relatively comparable studies demonstrate inconsistencies in the perceptions and experiences of constraints between students from different institutions.

Multiple-factor model research. Moving on from the 3-factor research, following the lead of Alexandris and Carroll (1997a) student constraint researchers began to further separate constraints into multiple dimensions. (Chung et al., 2013; Drakou, Tzetzis, & Mamantzi, 2008; Ehsani, 2005; Halforty & Radder, 2015; Liu, Chung, & Chen, 2013; Masmanidis et al., 2009; Masmanidis et al., 2015; Öcal, 2014; Tsai & Coleman, 2007, 2009). All but Drakou et al., who adopted Alexandris and Carroll's

scale, analysed the underlying structure of their data. The division of theoretical factors served two key purposes. It served to develop more reliable, valid, and context specific student *participation* constraint measures. More importantly, it enabled examination of the specific factors that influence individual's participation decisions, rather than assessing them from a more general level. Furthermore, in some cases the intention was to test the underlying structure of constraints through comparison of competing theoretical models: a 3-factor, a multiple-factor, and a second-order factor model (Casper et al., 2011; Chung et al., 2013; Masmanidis et al., 2015).

A number of these studies focused on very specific samples and constraints, such as the sport participation constraints of female Iranian undergraduates (Ehsani, 2005), the on-campus LTPA constraints of Turkish tertiary students residing in halls of residence (Öcal, 2014), and the organised sport constraints of senior South African undergraduates (Halforty & Radder, 2015). Ehsani examined female Iranian undergraduates' sport participation constraints. Data was analysed using EFA (principal component analysis [PCA] extraction, and Varimax [orthogonal] rotation), which resulted in an 8-factor solution. Regardless of the level of participation, facilities were the greatest constraint, followed by a lack of partners, and transportation. The remaining constraints in order of importance were a lack of: time, money, awareness, interest, skill/ability, and health/fitness. Overall constraints had a significant negative relationship with participation. Ehsani's study has several major limitations. First, it only involved females. Secondly, the EFA used orthogonal rotation, which forces factors to be unrelated. In reality, and according to CT they are not, so a more artificial result may have produced that is not an accurate reflection of what occurs naturally (Bryman & Cramer, 1990).

Öcal (2014) investigated the on-campus LTPA constraints of 563 Turkish tertiary students residing in halls of residence using the 38-item, 8-dimension LTPA-C Scale developed by Öcal (2012). An initial CFA was conducted to validate LTPA-C scale. Other variables measured included students': age, gender, employment status, program type (i.e. morning education, evening education), relationship status, monthly expenses and Body Mass Index (BMI), each of which were believed to be key variables that influence LTPA. Results revealed a hierarchy of constraints for males (from high to low) as follows: society, income, time, facility, willpower, skill perception, family, body

perception. Females were found to have a nearly identical hierarchy, except willpower was a greater constraint than facility. Moreover, only facility and willpower factors varied significantly between genders, with males more constrained by facilities, and females more constrained by willpower. Besides from the lack of generalisability due to focusing on university accommodation residents, this study's major limitation was in not analysing the relationship between other socio-demographic variables and constraints.

Halforty and Radder (2015) examined the constraints preventing 283 senior South African undergraduates from participating in organised sport. Constraints were assessed using items drawn from the measures used by Drakou et al. (2008) and Bloemhoff and Coetzee (2007). EFA (principal component extraction) identified six factors. Time was the greatest constraint for both genders, followed by accessibility, lack of partners, facilities, socialising activities (i.e. friends and family), and personal/psychological factors. Females were significantly more constrained by a lack of partners, as well as more constrained by both accessibility and facilities. Those with less money available for leisure were also significantly more constrained by accessibility and facilities compared to those with more money who conversely were significantly more constrained by socialising activities.

Though the specificity of the studies conducted by Ehsani (2005), Öcal (2014), and Halforty and Radder (2015) limits their generalisability, the fact that different constraint factors emerged from each study and that similar constraint factors were given different names demonstrates that perceived constraints potentially vary based on gender, culture, and context amongst other variables. Moreover, when recapping CT, Godbey et al. (2010) conceded that the relative strength and importance of constraints varies significantly depending on the social, cultural, and historical context.

Indeed, constraints have been shown to vary across cultures. Tsai and Coleman conducted two studies to compare constraints to active recreation, as well as other variables, between Australian and Chinese (Hong Kong) students (Tsai & Coleman, 2007, 2009). Both studies used a 12-item scale that CFA confirmed to have a 6-factor structure. It is concerning that so many factors were generated from so few factors, with some factors having only one item. Moreover, neither study reported the factor structure. Regardless, constraints differed significantly based on country. Australians

perceived significantly greater financial constraints, and Chinese perceived significantly greater competence, interpersonal, and physiological/physical constraints. Tsai and Coleman (2009) also reported that Chinese perceived significantly greater time and access constraints. Despite assessing gender, neither study analysed constraint gender differences. Both analysed constraint variations on other variables, finding that constraints varied significantly based on physical activity levels. Among a number of variables, Tsai and Coleman (2009) also measured active recreation engagement interest, finding that perceived intrapersonal (physical and competence) constraints tended to reduce interest. Physical constraints moderately reduced Australians' interest, but only had a weak influence on Chinese. Tsai & Coleman postulate that a strong sport culture, such as that present in Australia, results in the tendency for people to have greater personal physical performance expectations, consequently increasing the prominence of physical constraints.

Two other studies also examined Chinese students' constraints (Chung et al., 2013; Liu et al., 2013). The first the aimed to clarify the classification of constraint items on the leisure constraints scale to recreational sport participation (Alexandris & Carroll, 1997a, 1997b); and, to compare three competing measurement models (3-factor model, 7-factor model, and second-order model) (Chung et al.). EFA was conducted on one sample to identify the belongingness of the items before PCA was conducted on the remaining items to assess the response variance accounted for. CFA was conducted in another independent sample to examine the factorial validity of remaining items, and internal consistency reliabilities of sub-scales. CFA determined that the 7-factor model provided the best fit. In terms of the relative importance of the constraints, results indicated the greatest constraints were: a lack of time, mainly due to work, and social commitments; a lack of partners, due to not knowing anybody, or friends either being constrained by time or being uninterested; and, a lack of skills (Chung et al.).

Following on from Chung et al. (2013), Liu et al. (2013) examined the measurement invariance of a shortened version of the measure developed by Chung et al. across gender and physical activity status in a sample of Chinese undergraduates. Results provided further support for the 7-factor model of constraints (Chung et al.). Females were found to perceive significantly greater time, partner, psychological,

knowledge, and interest constraints compared to males. Physically inactive participants reported significantly higher scores on all constraints except for accessibility (Liu et al.).

Like Chung et al. (2013) and Liu et al. (2013), several studies focusing on Greek students have built upon the work of Alexandris and Carroll (1997a, 1997b) who, using Greek participants, were the among the first to develop constraint measures that divided factors beyond the traditional intrapersonal, interpersonal, and structural constraint factors. The first, conducted by Drakou et al. (2008), examined 320 Greek students' constraints to participation in physical activities using Alexandris and Carroll's (1997) instrument. FA was not conducted, possibly because the scale was developed for use in adult Greek populations. The greatest constraint was accessibility followed by facilities, company, time, knowledge, interest, and finally psychological constraints. Students who had grown up in smaller communities ($\leq 15,000$ people) were significantly more constrained by a lack of company. Results also indicate that those who take care of themselves in terms of diet do the same in terms of physical activity, and are less constrained by a lack of time, psychological constraints, lack of partners, and a lack of interest. Constraints did not differ significantly in relation to gender or weekly sport participation.

Masmanidis and colleagues (Masmanidis et al., 2009; Masmanidis et al., 2015) developed a measure named the University Sport Constraints Questionnaire (USCQ) to measure Greek students' constraints to CRS participation. Contemporary methodological and statistical procedures were used to develop the USCQ from an initial pool of items from the existing literature, as well as those produced from an open-ended question put to a group of students. Two pilot studies were then conducted to examine the factorial validity and eliminate items (Masmanidis et al., 2015). Data was then collected from 3041 students from seven different universities using the USCQ and was used in two separate studies. The first focused on the influence of students' perceived constraints on recreational sport participation (Masmanidis et al., 2009), and the second on determining the underlying structure of constraints (Masmanidis et al., 2015).

In terms of relative importance, Masmanidis et al. (2009) reported that structural constraints (accessibility, information, and facilities/services) were the

greatest, followed by partners, i.e. interpersonal constraints. Intrapersonal constraints showed the lowest values. Unlike the findings of most previous studies, a lack of time ranked as the only fifth greatest constraint. Like Alfadhil (1996), Masmanidis et al. differentiated between participants based on participation frequency, and found that constraints differed significantly between participants and non-participants. It would appear that lower constraints are associated with greater participation. The greatest difference was a lack of information, which constrained non-participants significantly more. In addition, compared to infrequent participants, regular (weekly) participants reported significantly lower constraints concerning a lack of information, individual/psychological factors, and a lack of time; as well as intrapersonal and structural constraints, but not interpersonal constraints.

The more recent analyses of the data by Masmanidis et al. (2015) was a response to Godbey et al.'s (2010) recommendation that researchers should develop instruments to capture perceived constraints in various contexts. The large sample size enabled the use of a cross-validation approach, using EFA and CFA on two independent groups of respondents. This procedure means that findings are likely relatively stable, and researchers can be confident about the USCQ's proposed factorial structure, where the second-order factor structure provided the best fit to the data. This is in line with current theoretical perspectives supporting the hierarchical leisure constraints model (Godbey et al.). However, it is worth noting that the average variance extracted of the time factor (.35) reported by Masmanidis was below the accepted cutoff point of .50 (Hair, Black, Babin, & Anderson, 2010), which raises questions about the convergent validity of the time factor. Moreover, in both studies the factor loadings of time constraint items were relatively low (Masmanidis et al., 2009; Masmanidis et al.). The justification for maintaining the time factor in the model was to be consistent with the prior literature where time has commonly emerged as an important constraint factor (Masmanidis et al.).

Prior to Chung et al. (2013) and Masmanidis et al. (2015), Casper et al. (2011) had also compared the three competing models and thoroughly examined all four levels of invariance (factor loadings, intercepts, variance-covariance, and error) in a large sample of American middle school students. Like Chung et al., Casper et al. found that the 7-factor model provided the most appropriate fit. Though the second-order

model also provided a good fit, suggesting that, while the theoretical structure may be effective in simplifying constraint categories, a more detailed specification using sub-dimensions is better for constraints measurement. In summary, it appears clear that a 3-factor model does not provide the best representation of constraints. However, rigorous instrument development and analysis conducted by Masmanidis et al. (2015) makes their findings hard to ignore. Thus, further investigation is required to determine whether a multiple-factor model or a second-order factor model best represents constraints. Though CT-based studies have the advantage of greater comparability due to the use of similar items, with a few exceptions (Masmanidis et al., 2009; Masmanidis et al., 2015) a lack of instrument redevelopment means that studies may have omitted some constraints. Thus, the findings of research conducted using methodologies not underpinned by CT should be considered when developing instruments that will be used to test the competing models.

Non-constraints theory research. A number of studies have also examined student *participation* constraints using methodologies not underpinned by CT. The findings of these studies offer an interesting contrast to those discussed above. These studies can be broken down into those that used agreement Likert-type scales similar to those used by CT-based studies, those that assessed the prevalence of constraints, and those that used other measures or methods including qualitative methods.

Before going into further detail, it is worthwhile comparing the findings of CT-based and non-CT based literature to identify similarities and differences. Similar to the CT-based literature, constraints concerning a lack of time also emerged as relatively important (Awadalla et al., 2014; Chan, 2014; Chan Sun & Azmutally, 2013; Cowie & Hamilton, 2014; Ebben & Brudzynski, 2008; El-Gilany et al., 2011; Gyurcsik et al., 2004; Gyurcsik, Spink, Bray, Chad, & Kwan, 2006; Henchy, 2011; Kamarudin & Omar-Fauzee, 2007; Kulavic et al., 2013; Montasser, El-Fattah, & Helal, 2011; Nolan & Surujlal, 2011; Rogers, 2016; Romaguera et al., 2011; Zizzi et al., 2004). However, that is where the similarities end. In relation to a lack of pertinent knowledge or information, such constraints were scarcely measured, as were those associated with facilities and services. Interpersonal constraints were assessed by a number of studies, but a lack of encouragement (Awadalla et al.; El-Gilany et al.; Grubbs & Carter, 2002; Ledford, 2013) and social influence (Kulavic et al.; Ramírez-Vélez et al., 2015; Wee Eng,

Aumand, Ler Hui, & Chan Kai, 2013) each emerged as moderately important, whereas a lack of partners was relatively unimportant (Gyurcsik et al., 2004; Gyurcsik et al., 2006). Intrapersonal constraints tended to be the most important following a lack of time. Although a number of non-CT studies reported a lack of motivation, interest, and willpower as less important constraints (El-Gilany et al.; Gyurcsik et al.; Wee Eng et al.), such constraints were reported as relatively elsewhere (Chan Sun & Azmutally; Cowie & Hamilton; Ebben & Brudzynski; Gyurcsik et al.; Kulavic et al.; Nolan & Surujlal; Ramírez-Vélez et al., 2015; Romaguera et al.; S. B. Smith, 2007). Another considerable contrast emerged in relation to fatigue related constraints, which emerged as important in numerous studies (Chan; Grubbs & Carter; Ledford; Lovell, Ansari, & Parker, 2010; Nolan & Surujlal; Romaguera et al.; Zizzi et al.). Finally a fear of injury, which was scarcely measured in CT-based studies (Qianyu & Ross, 2014; Stanek et al., 2015), was the most important constraint identified in two studies (Ramírez-Vélez et al.; Wee Eng et al.).

Seven cross-sectional studies used agreement Likert-type scales similar to those used by CT-based studies to assess constraints. Five of these studies used the exercise benefits/barriers scale (EBBS), which was developed by Sechrist, Walker, and Pender (1987), and has consistently been shown to provide a reliable measure of exercise barriers. Each EBBS study reported that the greatest exercise constraints revolved around fatigue and time (Chan, 2014; Grubbs & Carter, 2002; Kamarudin & Omar-Fauzee, 2007; Ledford, 2013; Lovell et al., 2010). These studies examined a variety of participants, including: American undergraduates (Grubbs & Carter), Chinese nursing undergraduates (Chan), Malaysian physiotherapy students (Kamarudin & Omar-Fauzee), non-exercising female UK students (Lovell et al.), and female African-American students (Ledford). Researchers also reported other findings concerning the relationship between constraints, *participation*, and benefits. In short, non-exercisers were reported to perceive significantly greater constraints, in particular those associated with time and physical exertion (Grubbs & Carter; Ledford); and, significantly less benefits (Grubbs & Carter). Moreover, perceived constraints were reported to have a significant negative relationship with perceived benefits (Chan; Lovell et al.) and self-efficacy (Chan).

The other two studies that used a measure comparable to those used in CT-based studies involved American students. Spivey and Hritz (2013) reported that a lack of time was the greatest constraint to CRS participation, followed by a lack of equipment, unawareness as to how get involved, self-consciousness exercising in front of others, and lack of a support network (family and friends). In addition, various differences in constraints were revealed based on participation levels in different CRS activities. The second study, conducted by Downes (2015), reported that physical activity levels had a significant negative relationship with constraints to physical and healthy dietary habits overall, as well as specific constraints including lack of motivation, lack of encouragement, health problems, lack of knowledge, and accessibility. However, Downes' findings should be interpreted with caution as participants were recruited from a community health fair so the sample may not be representative of the wider student populations, and constraints were framed in relation to physical activity and healthy dietary habits.

A small number of studies have used measures that resemble the Barriers to Being Active Quiz (Centers for Disease Control and Prevention, 2015), where constraints are rated on a likelihood Likert-type scale. A fear of injury was reported as the greatest constraint to Australian, Colombian and Malaysian students, followed by lack of skill, lack of resources, social influence, lack of time, lack of will power, and lack of energy (Ramírez-Vélez et al., 2015; Wee Eng et al., 2013). In contrast to Ramírez-Vélez et al. and Wee Eng et al., Kulavic et al. (2013) found that fear of injury was the least important constraint to American students' physical activity, whereas time and energy were the most important constraints. Furthermore, studies also reported contrasting findings concerning gender differences. Counter to the majority of other literature, compared to the opposite gender, Australian and Malaysian males (Wee Eng et al.), as well as Colombian females (Ramírez-Vélez et al.), reported a lack of time, energy, and willpower as significantly greater constraints. Ramírez-Vélez et al. also reported that social influence, a lack of skill, and lack of resources were also greater for Colombian females, though differences were not statistically significant. Australian and Malaysian males also reported a lack of skill as a significantly greater constraint compared to females (Wee Eng et al.).

Well over a dozen studies of varying quality have assessed the prevalence of a wide range of constraints amongst students. Using the same measure El-Gilany et al. (2011) and Awadalla et al. (2014) assessed the physical activity constraints of Egyptian and Saudi Arabian students respectively. In both studies time constraints were the most prevalent followed by accessibility, lack of encouragement from friends and others, and a lack of safe sporting places. Results suggest that physically inactive Saudi Arabian students were significantly more constrained compared to physically active students. Two other studies conducted by Nolan and Surujlal (2011) and Romaguera et al. (2011) examined the reasons for ceasing physical activity amongst South African undergraduates and Spanish students respectively. Time was the most common reason in both studies. In the case of South African undergraduates, time was followed by a lack of interest, a lack of money, and tiredness; whereas for Spanish students time was followed by laziness, tiredness, a lack of interest, and health problems.

Three similar studies used self-developed measures to assess the constraints to CRF usage amongst American students. A lack of time, tiredness, and inconvenience of the facility location/hours were reported as the primary constraints (Henchy, 2011; S. Smith, 2011; Zizzi et al., 2004).

A couple of studies used open-ended questions to assess the prevalence of constraints. Ebben and Brudzynski (2008) focused on non-exercising American students, and found time was the greatest constraint, followed by laziness, a lack of motivation, and tiredness. Chan Sun and Azmutally (2013) examined the LTPA motives and constraints of Mauritian students. Constraints encountered were mainly of an intrapersonal nature (83.7%). The main constraints (all intrapersonal) were related to a lack of time and lack of motivation. The main interpersonal constraints concerned the unavailability of friends or partners. More unique constraints included sedentary leisure and climate. Abdullah, Wong, Yam, and Fielding (2005) examined the patterns and predictors of physical inactivity of Chinese undergraduates. Physically inactive students specified why they were so, with a lack of time and interest revealed as the main reasons for physical inactivity. Significantly more females (25.4%) were constrained by a lack of interest compared to males (16.8%), and significantly more males (7%) than females (2%) were constrained by a lack of a partner.

A number of studies have examined how constraints change following the

transition. Though slightly less relevant to the current study, Bloemhoff and Coetzee (2007) examined how South African students' physically active recreation constraints had changed between the completion of secondary school to the completion of the third year of university study. The constraints of 410 students were measured at the end of their third year of university study in relation to their present constraints, and retrospectively in relation to their final year of secondary school. Those reporting constraints increased from just under half at secondary school to more two thirds (69.4%) during the third year of tertiary study. The three dominant constraints, study responsibilities, lack of motivation, and social responsibilities remained the same, but increased considerably in prevalence.

Along similar lines to Bloemhoff and Coetzee (2007) and of particular interest to this study, Gyurcsik and colleagues used open-ended questions to examine how constraints changed, or appear to change, during the *transition*. Gyurcsik et al. (2004) found that the most common barriers to VPA in 132 American females during the *transition* revolved around a lack of time, followed by social invitations, weather/seasonal factors, a lack of motivation, and a lack of partners. Gyurcsik et al. (2006) examined the constraints experienced by young Canadians in secondary school through to first-year tertiary students, using an ecological framework (intrapersonal, interpersonal, institutional, community, public policy, and physical environmental constraints). Constraints prevalence appeared to be dependent on age, with the number of constraints increasing with age to the extent that first-year tertiary students were significantly more constrained than secondary school students. After the *transition* it would appear that the prevalence of some constraints (time, social invitations, weather/darkness, health, and a lack partners) increases considerably. Gyurcsik et al. suggest that the prevalence of time related constraints are an indication of how students place a greater emphasis on academic activities during the *transition*, leading to *participation* becoming a secondary consideration.

Closer to NZ, Jones and Barrie (2011) assessed the prevalence of constraints on Australian students' use of facilities and club participation. Time was the greatest constraint followed by cost and distance. In the context of NZ, two studies that assessed the prevalence of a select number of *participation* constraints confirmed that a lack of time is the primary reason for NZ students ceasing *participation* following the

transition (Rogers, 2016), and the primary constraint preventing NZ adults from trying a new activity or increasing their *participation* (Sport NZ, 2015b). Cost and transport were the next greatest constraints reported by students (Rogers). Cost, poor health/disability/injury, and no facilities/parks nearby were the next three most prevalent constraints preventing NZ adults from trying a new activity or increasing their *participation*. All were reported at higher rates in relation to trying a new activity. Finally, a lack of knowledge of how or where to contact also constrained trying a new activity, but not further *participation* (Sport NZ).

Two other studies have also examined the constraints of students making the *transition*. Montasser et al. (2011) examined the association between socio-demographic factors, perceived constraints, support factors, sedentary behaviours and BMI, and the VPA patterns of a random sample of 500 first-year Egyptian tertiary students. Results appear to suggest that there is a positive relationship between perceived constraints and physical inactivity, as the prevalence of most constraints was greater among less active students, significantly so in relation to self-consciousness and a lack of facilities. In contrast, a positive relationship was found between support factors and physical activity; as more active respondents were supported more by others' encouragement compared to more sedentary students.

More recently, Cowie and Hamilton (2014) investigated key beliefs related to decisions for physical activity engagement among first-in-family Australian students transitioning to university. Of relevance to this study, beliefs that physical activity would take up too much time, result in tiredness, interfere with other commitments, and increase the risk of injury each had a significant negative association with the intention to engage in physical activity. Time had a significant negative association with behaviour. The normative beliefs of parents, friends, siblings, and partners each had a positive association with the intention to engage in physical activity, but the normative beliefs of health care professionals, fitness trainers, and fitness role models had no association with physical activity intentions.

A number of researchers have examined students' constraints using qualitative measures, three of which focused on females only. Two of these studies were conducted in Iran and South Africa and thus offer an interesting contrast to the findings of research from more Western cultures. Semi-structured in-depth interviews

with female Iranian students revealed that their sport participation was affected by interrelated social, cultural, structural, and personal constraints (Mirsafian, Dóczy, & Mohamadinejad, 2014). This is similar to the results of a South African study where focus group discussions were conducted with black or coloured female undergraduates (Asihel, 2005). A lack of time, skills, finance, and awareness of available recreational programs were the greatest constraints. A number of socio-cultural constraints also emerged, such as parental influence, cultural stereotypes, attitudes of others towards females' recreational sports, body image, fear for personal safety, lack of entitlement and ethic of care.

S. B. Smith (2007) conducted focus group discussions with American female students. The qualitative data revealed the top physical activity constraints to be time, abundance of unhealthy choices, stress, lack of knowledge, and willpower. S. B. Smith also used a quantitative measure to assess constraints, where body-related constraints ranked as the greatest, followed by convenience, resource, and social constraints. Smith, LaCaille, Dauner, Krambeer, and Pedersen (2011) and Nelson, Kocos, Lytle, and Perry (2009) both used focus groups to examine American undergraduates physical activity constraints. Findings to emerge from LaCaille et al.'s study were that a lack of motivation and fitness centre constraints (crowdedness, cost, and lack of skill and confidence to use equipment) had a negative impact on the physical activity of males and females respectively. The transition to college life and relationships, lack of time due to work and studies, and living off campus had negative effect on both genders' physical activity. Nelson et al. reported the following as constraints to physical activity: negative experiences using campus recreation facilities; poor weather; and, a lack of time/time management, motivation, and social support.

Measuring only the prevalence of constraints gives no insight into the strength of the constraints. Such measures were likely adopted because constraints comprised a relatively small part of a larger body of data collected. A strength of the use of open-ended questions was the emergence of more unique constraints such as weather/darkness. Bloemhoff and Coetzee's (2007) study is also potentially highly susceptible to recall bias or inaccuracies since participants were required to recall constraints from around three years prior (Hassan, 2005).

To summarise the findings of the non-CT based literature, time related

constraints emerged as the greatest/most prevalent constraint in all but a few studies where a fear of injury was the greatest. Fatigue related constraints, i.e. tiredness, a lack of energy, a lack of sleep, etc., also emerged as important constraints when measured. Interpersonal constraints were not widely assessed, but constraints concerning social support, i.e. the encouragement from family and peers, emerged as relatively important. A number of more unique constraints emerged, mainly from qualitative studies. Such constraints included: environmental constraints, such as bad weather, the climate, and darkness; safety concerns; a lack of encouragement from friends and others; sedentary leisure; and, an abundance of unhealthy choices. Finally, it is also interesting to note that Chan Sun and Azmutally (2013) classified time as an intrapersonal, rather than structural constraint.

It is apparent that a lack of time is the most important perceived constraint to students' *participation*. However, it remained unclear whether it is a lack of time or the perception of time that inhibits *participation* until Mercatante (2009) examined American students' perceptions of time and its influence on recreational sports. Mercatante concluded that poor time management, rather than a lack of time, constrains participation. Assuming Mercatante is correct, then time constraints lie primarily within the individual, i.e. intrapersonally, but are also influenced by interpersonal and structural factors.

2.6. Limitations

Studies that have investigated students' *participation*, motives, negotiation, and constraints share common limitations, including: a lack of generalisability, the use of self-reported measures, cross-sectional design, a lack of socio-demographic analysis, and a lack of qualitative explanation. Studies also share a number of unique limitations that mainly concern measurement and conceptual issues. This section will briefly discuss the common limitations before reviewing unique limitations in more depth.

Generalisability. Generalisability, more specifically generalisability to the context of NZ tertiary students, is a common limitation of the literature. Most studies used convenience samples, which limits the generalisability to other samples or contexts. Moreover, a considerable amount of the literature stems from the context of North American tertiary institutions. In the case of *participation* and constraints, there

are a couple of NZ studies, as well as a number of Asian and European studies that provide a broader picture of international students' *participation* and constraints. However, there is a lack of research concerning NZ students' motives and negotiation, with the majority of the international literature originating from North America.

Use of self-reported measures. Nearly all studies reviewed used self-reported measures, which have a number of validity associated limitations. Self-reported measures are based on participants' perceptions, and are therefore prone to misinterpretation, social desirability and are reliant on accurate recall (Slootmaker, Schuit, Chinapaw, Seidell, & van Mechelen, 2009). For example, participants may exaggerate positive behaviours such as motives or negotiation, or under-report the level of their constraints to avoid judgement. Objective measures of motives, negotiation, and constraints do not yet exist. However, objective measures of physical activity do exist, and have been shown to produce significantly different results compared to self-reported measures (Sirard, Hannan, Cutler, & Nuemark-Sztainer, 2013; Slootmaker et al.). For example, Sirard et al. (2013) reported that young adults significantly over-reported their MVPA, and that over-reporting was more pronounced with increasing levels of physical activity suggesting active young adults tend to overestimate their activity to a greater extent than mostly sedentary young adults. Sirard et al. also suggest young adults may also overestimate the breadth of their participation in different physical activities. These findings raise serious questions about the use of questionnaires to retrospectively quantify physical activity in adolescents (Slootmaker et al.), and young adults (Sirard et al.). Thus, there is a clear need for the use of more advanced assessments of physical activity in tertiary student populations. The predominant use of self-reported measures is likely attributable to their inexpensiveness in large-scale studies.

Cross-sectional design. The majority of the studies reviewed used a cross-sectional design. There is a lack of longitudinal research conducted on students' *participation* and constraints, with none on motives or negotiation. The lack of longitudinal research means it remains unclear how students' *participation*, motives, negotiation, and constraints vary across time.

Lack of socio-demographic analysis. Another set of limitations relate to the analysis of variations in students' *participation*, motives, negotiation, and constraints

based on socio-demographic variables. To date, only one peer-reviewed student negotiation study has examined whether negotiation varied based on socio-demographic variables (Elkins et al., 2007). Though negotiation differed significantly by gender, subsequent studies have not repeated the analysis despite assessing participants' gender. A similar trend emerges from the constraints literature, where many studies have neglected to analyse whether constraints varied based on socio-demographic variables despite collecting the necessary information. This is despite the fact that an early study upon which multiple further studies are based reported that students' constraints varied significantly based on age, gender, and living situation (Young et al., 2003). Comparable trends exist in the *participation* and motives literature. Gender differences have been analysed in most *participation* and motives studies, likely due to such analyses consistently producing significant results. But, differences based on age and ethnicity are rarely analysed despite nearly all studies having the necessary data. In the case of ethnicity, analysis might be unfeasible due to inadequate sample sizes. In the case of age, analysis might be unfeasible due to limited age range preventing age group categorisation. However, no reason has been provided for the lack of analysis. Significant differences have been revealed based on various other socio-demographic variables, but for the most part researchers have opted not to investigate whether such findings are reproducible in other contexts.

Lack of qualitative research. There is a lack of qualitative research concerning students' *participation*, motives, negotiation, and constraints. Qualitative student *participation* research is absent in the literature, which is likely attributable to this domain of knowledge being dominated by quantitative methodologies. Similarly, no qualitative student negotiation studies exist, which is a considerable limitation since quantitative measures are largely based on the findings of a relatively old study involving secondary school students (Jackson & Rucks, 1995). As far as motives and constraints, several qualitative studies exist, and, as discussed, offer value in the form of identification of motives and constraints excluded by quantitative measures. This highlights the major limitation of a lack of qualitative research, in that researchers run the risk of missing the presence/emergence of new motives, negotiation strategies, and constraints salient to the next generation of participants. Furthermore, language is forever changing with culture (Lieberman, Michel, Jackson, Tang, & Nowak, 2007).

Thus, the quality, and even validity, of quantitative research would potentially stand to be enhanced by ensuring that the language used remains relevant/applicable to the current generation of participants.

Participation. Aside from the subjective nature of most *participation* measures, the variation in *participation* measures complicates comparison of study findings. The literature can generally be categorised into studies that focused on physical activity, and those that focused on physical activity and sport. Researchers have assessed *participation* using various combinations of duration, frequency, intensity, and, in some cases type of physical activity. In addition to the complications arising from the variation in *participation* measures, the guidelines used to classify participants as sufficiently or insufficiently active also vary. Such guidelines vary between countries, as well as across time in the same country. Moreover, when classifying participants as active or insufficiently active, researchers have ignored the resistance and flexibility training recommendations most national health organisations include in their guidelines.

Motives. The main limitation of the motives literature is that student-specific sport and/or exercise motive instruments have yet to be developed or validated. Instead, researchers have used instruments such as the EMI-2 and the LMS in student populations without testing their construct validity. This is important since such instruments were not designed specifically for use with student populations.

Negotiation. Similar to motives, the primary limitation concerning negotiation is the absence of the development and validation of a student-specific negotiation instrument that includes both cognitive and behavioural strategies. There is also little qualitative research, with some strategies not yet included in any quantitative measures. More importantly, perhaps due to the relatively recent emergence of the concept of negotiation, two questions about the psychometric properties of negotiation measurement remain unanswered: (1) what order model (first or second) does the measurement of negotiation follow?; and, (2) do negotiation items load equally on factors? (Guo & Scheider, 2015). The first fundamental conceptual question as to whether negotiation exists as an interconnected latent construct has yet to be fully established by a second-order model. Findings to date have been mixed, with the most promising being those of Yerlisu-Lapa (2014), who through rigorous analysis

established that data concerning Turkish students' negotiation of sport and recreation participation constraints, collected using a translated version of Beggs et al.'s (2005) instrument, fit both a first-order 6-factor solution, as well a second-order factor structure. However, Guo and Scheider struggled to achieve similar results; and, the lack of support for tau-equivalence indicates that aggregated data should be interpreted with caution. In addition, Guo and Scheider's results indicated that negotiation is understood differently in different cultures, and thus that instruments are not necessarily cross-culturally applicable as has been assumed by researchers. As far as the second question, most studies to date have used aggregated sub-scale scores as indicators of negotiation. Thus, unequal factor loadings indicated by tau-equivalence mean the use of mean-scale score could change the manifestation of the latent variable and has resulted in invalid negotiation measurement, and therefore misinterpretation of findings (Guo & Scheider). Finally, the lack of consistency of items included in negotiation measures complicates direct comparison of findings between studies.

Constraints. The major limitation in the constraints literature the assumption that certain constraints are consistently intrapersonal, interpersonal, or structural in different contexts. The factor structure of constraints, and whether they fit a multiple-factor or second-order factor model is still up for debate. In addition, some of the prominent constraints to emerge from non-CT based studies, previously omitted from CT-based studies, may warrant inclusion if and when instruments are redeveloped. Finally, statistical indicators raise questions about the convergent validity of time constraints.

2.7. Future Research Recommendations

Researchers of students' *participation*, motives, negotiation, and constraints have made future research recommendations including: a call for more longitudinal studies; more analysis of variations based on socio-demographic variables; larger samples; studies to be conducted in different contexts, more inclusive/broader *participation* measures; and further qualitative research. This section will briefly discuss the common recommendations before reviewing more novel recommendations in greater depth.

Longitudinal research. Longitudinal research is among the most common recommendations made by past researchers. Longitudinal research was a particularly common recommendation made in relation to *participation* (Cowie & Hamilton, 2014; Cullen et al., 1999; Dodd et al., 2010; Kiger, 1996; Schmidt, 2012; Shafer, 2012; Sigmundová, Chmelík, Sigmund, Feltlová, & Frömel, 2013; S. Smith, 2011; Ullrich-French et al., 2013), motives (Ciuffo et al., 2014; Egli et al., 2011; Kiger; Kilpatrick et al., 2005; Morales, 2009), and, to a lesser extent, constraints (Abdullah et al., 2005; Gyurcsik et al., 2006; Lovell et al., 2010; S. Smith). In the case of *participation*, some advocated for assessing students' physical activity throughout their time pursuing a tertiary education (Dodd et al.; Kiger; Shafer; S. Smith). Sigmundová et al. stressed the importance of further examination of the transition into adulthood, and others suggested investigations of differences in physical activity by different post-secondary pathway, i.e. tertiary study, the workforce, unemployment, etc. (Cullen et al.; Leighton & Swerissen). For motives, longitudinal studies would provide a better understanding of how individual's motives can change and influence *participation* (Egli et al.). In terms of constraints, Jackson (2000) called for further research into whether constraints are particularly pertinent during life transitions and whether such transitions provide new opportunities for constraint negotiation. S. Smith advocated for following students across their time at university, and Gyurcsik et al. suggested that a study such as theirs be extended to include the later years of tertiary study. Finally, there have been no longitudinal studies conducted on the negotiation process across the life-span (Son, Kerstetter, et al., 2008), or even through the *transition*. Thus, the stability or adaptability of negotiation strategies over time remains unknown.

Influence of socio-demographic variables. Researchers have advocated for further research into the relationship(s) between a variety of socio-demographic variables and *participation*, motives, negotiation, and constraints. Further investigation of the relationship between physical activity and various socio-demographic variables, in particular age, gender, and ethnicity was also recommended (Cagas et al., 2015; Chan, 2014; Cullen et al., 1999; McArthur & Raedeke, 2009; McElroy & Jordan, 2014; Pedišić et al., 2014; Schmidt; Seo et al., 2012; S. Smith, 2011). Other suggestions include investigating the relationship between motives and a range of variables such as: past *participation* experience (Ciuffo et al.; Cooper et al., 2012); participation levels

across other activities (Cooper et al.); socio-economic variables (Egli et al., 2011); ethnicity and marital (relationship) status (Yoh, 2009); and, leisure satisfaction (Beggs & Elkins, 2010). Researchers have also called for further investigation of how socio-demographic variables such as age, gender, and course of study are related to the negotiation process (Beggs et al., 2005; Henderson & Bialeschki, 1993; Loucks-Atkinson & Mannell, 2007; Rehman et al., 2003; Rintaugu et al., 2013; Son, Mowen, et al., 2008). In fact, Son et al. (2008) suggested that negotiation process research should control for the effects of age, gender, health, ethnicity, SES, etc. A more comprehensive investigation into cross-cultural differences seems warranted according to Yerlisu-Lapa (2014), as does examination of the constraint negotiation process. Others have called for further examination of the relationship between specific negotiation strategies and constraints (Loucks-Atkinson & Mannell; Son, Mowen, et al.). Constraints researchers have also recommended further investigation into the relationship between socio-demographic variables and constraints, in particular gender (Chan, 2014; Gyurcsik et al., 2006) and ethnicity (Kamarudin & Omar-Fauzee, 2007; Minkel, 2010; S. Smith, 2011). S. Smith also proposed further research focused solely on non-participants assessing their rationale for non-participation. Jackson (1988) had earlier called for comparative studies of the relationships between constraints, and the distinct behavioural aspects (non-participation, ceasing participation etc.). This has not yet been done.

Sampling. Many have advocated for the use of larger samples (Awadalla et al., 2014; Beville et al., 2014; Boren, 2014; Ciuffo et al., 2014; Gitonga & Nteere, 2011; Hashim, 2012; Nehl et al., 2012; Qianyu & Ross, 2014). In addition, despite nearly all existing studies using convenience samples, only a few recommended the use of random (Beville et al.; Irwin; Liu et al.; Nehl et al.), or probability sampling strategies (Beggs et al.) which would likely improve the generalisability of findings within the given population.

Context. In addition to larger samples, researchers have also called for research involving samples from more diverse contexts. Researchers have called for the replication of studies in other (Beggs et al., 2005; Beggs et al., 2014; Kiger, 1996; Qianyu & Ross; Wood, 2011; Young, Sturts, & Ross, 2015) and more diverse institutions (Boren), both public and private institutions (Öcal, 2014), all types of campuses

(Halford & Radder, 2015), as well as in different geographical areas (Kamarudin & Omar-Fauzee, 2007; Spivey & Hritz, 2013). Moreover, Ciuffo et al. recommended using a large diverse sample of participants from respondents from multiple institutions in order to enhance external validity. Further research could include all sections of the student population (Abdullah et al., 2005), populations with different characteristics, such as non-students (Cagas et al., 2015; Kiger), and more specifically working people and elderly (Chung et al., 2013; Liu et al., 2013; Masmanidis et al., 2009).

Participation measurement. There are many ways that *participation* measurement could be improved. A common recommendation was the use of a more objective physical activity measure to increase validity (Dodd et al.; Jung, Bray, & Ginis, 2008; Nehl et al., 2012; Pinto et al., 1998; Sinclair et al., 2005; Ullrich-French et al.). Suggestions included the use of motion monitors (Dodd et al.; Pinto et al.) and accelerometers (Jung et al.), as well as testing physical fitness (Pinto et al.). Liu et al. (2013) went even further, recommending the use of a more objective measure that captures frequency and duration as well as energy expenditure. Finally, Ullrich-French et al. recommended that researchers assess the mode, i.e. type, of activity.

Another recommendation was that measures encompass all physically active leisure activities available to students (Cooper et al., 2012; Kiger; Rintaugu et al., 2013; Wood, 2011; Wood & Danylchuk, 2015). This recommendation complicates determination as to exactly what type/mode of physically active leisure motives, negotiation, or constraints relate to as these psychological constructs vary based on each type of physical activity. Thus, researchers should decide whether to take either a very broad or very specific approach when designing studies. If a broad approach is taken, then different physical activities could be treated as dependent variables (Kiger).

Current studies tend to assess the *participation* frequency, duration, and/or intensity. Wood (2011) recommended a measure that encompasses intensity and duration in addition to frequency. Zizzi et al. (2004) suggested that researchers document exercise patterns more thoroughly by including data on the mode and intensity to determine how closely participants are meeting national health guidelines for physical activity.

Also related to *participation* measurement, motives researchers have advocated for the inclusion of non-participants (Beggs et al., 2004; Morales, 2009), which will likely provide a better understanding of the relationship between students' *participation* motives, or lack thereof, therefore enabling non-participants' *participation* needs to be better satisfied (Beggs et al.). Beggs et al. suggest that insight provided by this approach will be particularly important as opportunities for *participation* in various activities evolve and preferences change. The inclusion of non-participants would also benefit negotiation and constraints research. In fact, Masmanidis et al. (2009) called for further research into the differences in the constraints of participants and non-participants, as well as students' latent demand for participation.

Qualitative research. Several constraint researchers suggested a qualitative approach, which may: help to identify different, previously unidentified, constraints (Alfadhil, 1996); provide a deeper understanding of constraints among tertiary students, including the relationship between physical activity levels and constraints (Öcal, 2014); and, offer a unique perspective into students' perceived constraints (Spivey & Hritz, 2013). The same benefits would be offered by qualitative research into students' *participation*, motives, and negotiation.

Motives. In addition, to qualitative research, Beggs et al. (2014) recommended using alternative instruments and paradigms in order to provide additional insight into *participation* motives, and avoid narrowing the focus of research too much. Beggs et al. suggested that insight provided by this approach will be particularly important as opportunities for *participation* in various activities evolve and preferences change.

Negotiation. In the case of negotiation, qualitative research will likely enable exploration of questions raised about the various negotiation strategies and their foundations (Guo & Scheider, 2015) and, potentially provide new insight and assist with instrument development and refinement (Jackson & Rucks, 1995). Such development is required, given two questions about the psychometric properties of negotiation measurement remain unanswered (Guo & Scheider). Moreover, it is clear that better procedures need to be employed in relation to the measurement and subsequent analysis of negotiation. To date, student focused negotiation research has excluded the 'changing leisure aspirations' dimension and associated items, as well as

cognitive strategies. Inclusion of the former may guide future research into substitution, and the latter's inclusion has proved important in adult focused studies (Wilhelm Stanis et al., 2009). In addition, examining how the same individuals deal with constraints to different leisure experiences will enhance the understanding of constraints' universality (Guo & Scheider). Loucks-Atkinson and Mannell (2007) also called for further research into how constraint anticipation can result in antecedent constraints that suppress the desire to participate.

Constraints. In terms of constraints, there are a number of aspects of this construct that require further investigation. Research into the factor structure of constraints could determine whether a multiple-factor or second-order factor model provides the best fit. Second, Godbey et al. (2010) asserted that CT and CT based instruments are cross-culturally applicable. However, this assertion is primarily based on evidence from research largely conducted using the original three-factor constraints measurement developed by Raymore et al. (1993), of which the factor structure was rarely tested. Thus, CT and CT based instruments would appear to require further validation based on the contrasting results produced by studies conducted in different cultural contexts. Researchers who have recently developed their own instruments have called for examination of the cross-cultural applicability of instruments and models (Chung et al., 2013; Masmanidis et al., 2015; Öcal, 2014). In particular these instruments should be tested for applicability between eastern and western cultures (Chung et al.). Finally, time constraints, and their categorisation as either intrapersonal (Chan Sun & Azmutally, 2013) or structural (Crawford & Godbey, 1987), requires further investigation. This is especially true in light of findings that indicate time management, rather than a lack of time, is what constrains *participation* given time management is conceivably intrapersonal, but is influenced by other interpersonal and structural factors.

2.8. Conclusion

In conclusion, a comprehensive review of the literature revealed a lack of research conducted in the context of NZ tertiary institutions pertaining to students' motives, negotiation strategies, and constraints in relation to *participation*. Moreover, there is also a lack of research concerning the constraint negotiation process in

relation to student populations. It is also apparent that changes in students' *participation* following the *transition*, other than the level of *participation*, have yet to be examined in great depth. Nor have changes in students' motives, negotiation strategies, and to a lesser extent constraints.

Chapter 3: Methods

This chapter outlines the methodological approach adopted and the methods used to gather and analyse data in nine sections: methodology, sampling procedures and participants, measures, pilot study, data collection, data treatment, quantitative data analysis, and qualitative data analysis.

3.1. Methodology

This cross-sectional study adopted a component mixed-methods approach to most effectively achieve the study's two aims, to: (1) assess the relationship(s) between *participation* and influencing factors; and, (2) identify how *participation* and factors that influence *participation* change following the *transition*. A cross-sectional design was chosen due to its expediency and inexpensiveness, and its ability to identify and quantify the relationships specified in the study's aims (Bombardier, Kerr, Shannon, & Frank, 1994; Hulley, Newman, & Cummings, 2001; Levin, 2006). A mixed-methods approach was adopted to give voice to participants, and allow them the opportunity to comment on factors influencing and/or changes in *participation* not encompassed by quantitative measures. The component mixed-methods design approach is reflected in the independence of quantitative and qualitative components during analysis and reporting of results, before integration of components when findings are interpreted in chapter five (Greene, 2007). *Participation*, motives, negotiation strategies and constraints (*psychological constructs*), and participant socio-demographic data was collected using an online questionnaire. The university Enrolment Services department provided additional socio-demographic data.

Quantitative component. The quantitative component is based on positivism, that is, the assumption that the nature of social reality is relatively stable and based on discoverable pre-existing patterns (Grant & Giddings, 2002). Thus, this component was appropriate for achieving the study's first aim to 'assess the relationship(s) between *participation* and factors that influence *participation*', and part of the second aim to 'assess how *participation* changes following the *transition*'.

Qualitative component. A qualitative component was incorporated to: (1) provide deeper insight into how factors that influence *participation*, and *participation* itself, had changed following the *transition*; and, (2) provide participants the

opportunity to comment on factors not encompassed by quantitative measures. Basic qualitative description, as opposed to theory driven (interpretive) qualitative analysis, was selected to inform data analysis as it involves: (1) a descriptive presentation of data which stays true to the participants' words; and, (2) a low-inference interpretation that is likely to result in easier consensus among researchers (Sandelowski, 2000). Qualitative data was analysed using thematic analysis, a method that focuses on analysing what was said rather than how it was said (Howitt, 2010); and, is used to identify, analyse, and report themes within data (Braun & Clarke, 2006). Benefits of thematic analysis include: flexibility; the absence of theoretical or technological bias; the highlighting of similarities and differences across the data set; generation of unanticipated insights; allowance for both social and psychological interpretations of the data; and, potentially, provision of a richer and detailed, yet complex, account of the data (Braun & Clarke).

3.2. Sampling Procedures and Participants

Participants were a purposive sample of first-year students from a medium-sized NZ university aged over 18 years and who transitioned to tertiary study in 2015 having graduated secondary school in 2014. An online questionnaire was distributed and promoted to all first-year undergraduates. Due to the limitations of retrospective self-reported data (Hassan, 2005), mainly recall accuracy, the participant inclusion criteria were adopted to select individuals considered to have the ability to most accurately recall how *participation*, and factors that influence *participation*, had changed following the *transition*. Respondents not fitting the participant criteria were removed.

3.3. Measures

A four-section questionnaire was developed for this study (see **Appendix D**) consisting of: socio-demographic information (Section A); *participation* (Section B); *psychological constructs* (Section C), which consisted of three sub-sections relating to the three respective constructs; and, transition effects (Section D), which included several open-ended questions pertaining to changes in *participation* and the *psychological constructs* following the *transition*.

An extensive review of student-focused literature concerning *participation* and the *psychological constructs* informed the questionnaire development. The questionnaire was designed to assess: socio-demographic variables of interest; participants' *participation* habits as secondary school and tertiary students; the strength of *participation* motives; the frequency with which negotiation strategies were employed in order to participate in physical activities and sports; the perceived strength of *participation* constraints; and, changes in *participation* and the *psychological constructs* following the *transition*.

Socio-demographic information (Section A). Enrolment Services provided some basic demographic information. Age, gender, ethnicity, degree(s), and course codes, enabled the reporting of participant characteristics. Participants' degree(s) and course codes enabled categorisation by faculty, and the identification of participants' course load. Further information allowed the identification of those who were the first in their family to attend university; whether participants were international or domestic students; and whether they were distance students. Finally, the secondary school from which participants graduated was provided. Overseas graduates were categorised as 'overseas'. Domestic students were categorised based on: their final secondary school's region; whether their school was co-educational or single sex; and whether secondary school was public, integrated, or private/independent. Finally, socio-demographic variables were used either to exclude participants who did not fit the participant criteria, or as independent variables where feasible in the data analysis.

Section A was designed to obtain socio-demographic information not provided by Enrolment Services. Socio-demographic information was gathered using four questions pertaining to: participants' living situation, physical disabilities, paid employment, and volunteering. Participants' living situation had previously been shown to have associations with *participation* and *psychological constructs* (Young et al., 2003; Zizzi et al., 2004), and provided context for qualitative data. Like living situation, the presence or absence of physical disability, a factor neglected in most past studies, was considered as another factor that would provide context for qualitative data, as well as allowing the analysis of differences between able-bodied and physically impaired participants. Finally, employment and volunteering levels were

measured to examine their relationships with *participation* and *psychological constructs*.

Participation (Section B). *Participation* data was gathered using eight questions, four relating to *participation* as a secondary school student, and four relating to *participation* as a tertiary student. *Participation* frequency (average number of sessions/week), and *participation* duration (average number of hours/week) were queried for current activity as a tertiary student and retrospectively for activity as a secondary school student. Participants were also asked to specify the types of physical activities that they had participated in. Informal sport, external sport clubs, representative (regional or national) sport, and gym and fitness activities were options offered in relation to both time points. Secondary school *participation* included the option of 'secondary school sport teams'; whereas 'university sport club' and 'university sport competitions' (i.e. intramural sport) were options related to tertiary *participation*. Participants were also offered the opportunity to list the specific types of physical activities and sports they had participated in at both time points in an open-ended question.

Psychological constructs (Section C). In Section C participants were presented with separate instruments that measured motives, negotiation, and constraints. Instruments were presented in that order so that participants were asked 'why' then 'how' they participated in physical activities and sports before being asked 'what constrained' their *participation*. Each instrument comprised items drawn from measures previously used to assess each construct in student populations that had been demonstrated to be both reliable and valid. Items were adapted to reflect the study's context and ensure relevance to participants; and, at the researcher's discretion, the size of each instrument was reduced to limit questionnaire length. Table 2 provides an overview of the number of items and the scale used for each instrument. Each instrument is then discussed in more detail.

Table 2: *Overview of Psychological Construct Instruments*

Instrument	Items	Likert scale range
Motives	19	1 (strongly disagree) to 7 (strongly agree)
Negotiation	17	1 (never) to 7 (very often)
Constraints	21 ^a	1 (strongly disagree) to 7 (strongly agree)

^a Two items ('a lack of time due to work commitments', and 'a lack of time due to volunteering commitments') were only presented to those who indicated, in Section A, that they were employed and/or volunteered.

Motives. The 19 motive items were drawn from the EMI-2 (Markland & Ingledew, 1997), and the LMS (Beard & Ragheb, 1983). A theoretical framework underpins neither the EMI-2 nor LMS, though the EMI-2 is loosely based on SDT in the sense that some motives are reflective of intrinsic or extrinsic motives. The LMS was originally developed to assess the psychological and sociological reasons for leisure participation (Beard & Ragheb, 1983), not *participation*. There was considerable crossover between the 83 items encompassed by both instruments. A number of items, namely competence-mastery and interpersonal items, are common to both instruments. Each of the EMI-2's 14 sub-scales/dimensions is represented, whereas the LMS contributed two unique items (relaxation and escape) from its stimulus-avoidance dimension. Finally, unlike this study's motive instrument, the EMI-2 and LMS measure motives using a five-point Likert scale that asks participants to rate the extent to which items are applicable to them.

Negotiation. The 17 negotiation items were adapted versions of items drawn from the 31-item instrument developed by Beggs et al. (2005) to assess strategies used by students to negotiate CRS participation constraints. Modified versions of Beggs et al.'s items used by Wood (2011) in a similar study were also considered for inclusion. All items were reworded so that they began with 'I' rather than merely being a statement to get participants thinking in terms of how often they personally employed strategies. Other important changes included: separation of the item on the cutting short of time for one's social and work commitments into two distinct items; inversion of an item to assess the frequency of participation with the opposite gender, rather than the same gender; separation of skill acquisition and information acquisition into separate items; and, alteration of an item to assess the frequency of participation in less competitive activities.

Constraints. All but one of the 21 constraint items were adapted versions of items drawn from measures developed and validated by Masmanidis et al. (2009) and Chung et al. (2013) in studies that categorised constraints into intrapersonal, interpersonal, and structural dimensions as outlined by CT. These scales were developed using Greek (Masmanidis et al.) and Chinese (Chung et al.) students in relation to sport participation. Previous scales did not include a ‘cultural beliefs’ item, which was included due to the findings of qualitative research suggesting that cultural beliefs and traditions can constrain participation, particularly amongst females (Asihel, 2005; Mirsafian, 2014). Only workers and volunteers were presented with items concerning work and volunteering related time constraints respectively. As such, these items were excluded from FA.

Transition effects (Section D). Section D was designed to offer participants the opportunity to describe changes in their *participation*, and the *psychological constructs* following the *transition*. It also served to identify motives, negotiation strategies, and constraints not encompassed by the respective instruments. Changes in *participation* and each of the *psychological constructs* were assessed using the four open-ended questions that followed the same basic pattern:

“Following the *transition* how did:

- your *participation* change?
- your motives for *participation* change?
- the strategies you use to participate in sport and physical activities change?
- the constraints/barriers/obstacles to *participation* change?”

A final question offered participants the opportunity to make further general comments about sport and recreation at the university.

3.4. Pilot Study

A pilot study was conducted with a convenience sample of 11 second and third year sport coaching and physical education students (5 females, 6 males) recruited from the university’s School of Sport and Physical Education with the assistance of the Bachelor of Sport Coaching programme coordinator, Dr Jenny Clarke. Participants were offered free refreshments in return for completing the questionnaire then providing feedback around the questionnaire construction. On average, the questionnaire took

11min to complete. Feedback resulted in the: correction of a few minor grammatical errors; alteration of an item to improve readability; and, addition of optional questions asking what types of physical activities participants had participated in at both time points. Participants indicated that they understood all of the questions and items. Furthermore, participants felt compelled to express their opinions and experiences in the open-ended questions at the end of the questionnaire.

3.5. Data Collection

The questionnaire was distributed and promoted to participants following the pilot study and instrument revision. Data collection took place following the end-of-year exams. Participants were recruited using two methods: (1) a closed-link questionnaire distributed via email to all first-year students aged over 18 years and for whom 2015 was their first year of tertiary study and (3168 fit this criteria); and, (2) an open-link questionnaire promoted to all first-year students, including the initial sample, online via social media.

In order to maintain participant confidentiality Dr Jenny Clarke received the contact details from Enrolment Services, distributed the closed-link questionnaire, and hosted the open-link questionnaire. Dr Clarke anonymised data prior to providing it to the primary researcher. Respondents' student identification (ID) numbers were used to request the socio-demographic information data match from Enrolment Services.

Both questionnaire versions included the information sheet (see **Appendix E**) which: introduced the study to the respondents and explained the study's purpose; assured respondents' total confidentiality, and explained that demographic data would be requested from Enrolment Services; informed respondents that participation was voluntary; and, provided respondents with instructions as to how to withdraw and the last date possible for withdrawal. Respondents were presented with the information sheet prior to being presented with the consent statement (see **Appendix F**), which required participants to agree that: they had received a full explanation of the project; they understood that participation is voluntary; they had the right to withdraw; and, their responses would remain confidential.

Questionnaire distribution and promotion.

Closed-link questionnaire. The closed-link questionnaire was distributed by

email using Qualtrics software (Qualtrics, Provo, Utah, USA) using contact details provided by Enrolment Services. Participants received a personalised email via student email accounts following the end-of-year examinations. Participants were presented with the information sheet (**Appendix E**) in the initial part of the message, before being instructed to select a link that directed them to the questionnaire. Participants were presented with the consent statement on the first page of the questionnaire, and were required to select the 'agree' button before commencing the questionnaire. A reminder email was sent two weeks after the initial email. During the first week the questionnaire was open it was also promoted online via social media.

Open-link questionnaire. Unfortunately many students did not receive the initial email due to the university's spam filter. Following a second ethics amendment an open-link questionnaire was created and promoted to first-year students online using the Student Blog and Facebook. The open-link questionnaire was a duplicate of the closed-link questionnaire with two minor additions: (1) the participant information sheet was presented preceding the consent statement, and respondents were required to agree that they had read the information before progressing to the questionnaire; and, (2) respondents were required to enter their student ID number before proceeding to enable a data match to take place with socio-demographic information from Enrolment Services.

Prize draw. Respondents were offered the opportunity to enter a draw to win \$500 worth of prizes (five \$50 Westfield vouchers, and one grand prize of a \$250 Westfield voucher). Upon completion of the questionnaire, respondents were presented with the opportunity to provide contact details to enter the draw. These details were held separate from the questionnaire responses.

3.6. Data Treatment

A combined total of 224 responses were received from both questionnaires. The responses of 121 individuals who fit the participant inclusion criteria were retained following data cleaning procedures: six respondents who provided an invalid student ID were removed; a further 63 respondents who had not completed the *transition* in 2015 (i.e. were second year of above, or who had not graduated secondary school in 2014) were removed; 31 more respondents were removed due to

either: incomplete responses in most cases, or too much missing data in a few other cases; finally, a further three respondents not fitting other criteria were removed. Screening using student ID numbers confirmed that no students completed the survey more than once.

The final sample consisted of 121 respondents. Two of this group had completed the *transition* in the second half of 2015, but were retained at the researcher's discretion due to both respondents studying full-time during the second semester and having provided complete responses. Unlike past comparable studies, the five part-time students were retained. Respondents were screened to determine whether they were distance students. The 121 participants took an average of 16min ($SD = 12.4\text{min}$) to complete the questionnaire.

3.7. Quantitative Data Analysis

Quantitative data was analysed using IBM SPSS Statistics (Version 23.0). Descriptive statistics (means, percentages, and standard deviations) were initially used to explore the data. The underlying structures of the psychological construct instruments were analysed using the EFA method of Principal Axis Factoring (PAF) with an oblique (direct oblim) rotation. Differences between groups were explored using complementary parametric and non-parametric techniques, and relationships between variables were explored using parametric techniques.

Preliminary analysis. Prior to analysis, data was checked to ensure that statistical assumptions were not violated, and that there were an adequate number of cases. *Participation* data included both dichotomous and continuous variables, whereas psychological construct data is ordinal. Procedures used to handle missing data are discussed in the results section, and ensured that the related pairs assumption was met. Respondents completed the questionnaire at their own leisure. The questionnaire was distributed after the end-of-year exams when most students had returned home meaning, it is unlikely that respondents completed the questionnaire together (i.e. it is unlikely that they violated the assumption independence of observations).

The Kolmogorov-Smirnov statistic was significant for *participation* frequency and duration data, and the *psychological construct* instrument items, indicating the

data was not normally distributed. The skewness of these variables was also outside the recommended parameters. Although parametric techniques assume that data is normally distributed, dependent variable scores are rarely normally distributed in social research, such as this study (Pallant, 2013). Moreover, most parametric techniques tolerate violations of the assumption of normality, and no problems should be experienced in samples larger than ~30 participants (Pallant). Analysis was therefore conducted without attempting transformations and, where viable, data was analysed using complementary parametric and non-parametric techniques.

Scatterplot shape inspection checked the assumptions of linearity and homoscedasticity. When conducting regression analyses, checks were conducted to confirm that the assumption of multicollinearity was not violated, as indicated by correlations between independent variables of less than .9, tolerance values greater than .1, and variance inflation factors less than 10 (Pallant, 2013). Multiple regression analyses included far less than the maximum of eight independent variables the sample size allowed (Tabachnick & Fidell, 2013). Moreover, adjusted r^2 is reported rather than the r^2 due to the smaller sample size (Pallant).

Finally, descriptive statistics are reported without the removal of outliers. Outliers were checked for by visually inspecting dot and scatterplots (Johnson & Wichern, 2007). Analyses were monitored for large differences in the 5% trimmed mean (Pallant, 2013). Multiple regression is very sensitive to outliers, so outliers were identified by inspecting the minimum and maximum standardised residual values, and Mahalanobis and Cook's distances, to see if they exceeded the critical values (Tabachnick & Fidell, 2013). Only outliers that exceeded critical values were removed, all other data was retained.

Data structure analysis procedures. Four major decisions, each of which can have significant influence on the model result, must be made when conducting factor analyses: (1) establishing the minimum/appropriate sample size to achieve accurate parameter estimates and adequate power; (2) data extraction method selection; (3) factor retention determination; and, (4) factor rotation method selection (Gaskin & Happell, 2014; Schmitt, 2011). The overarching aim of this analysis is to achieve parsimony, i.e. discovery of the simplest method of data interpretation (Yong & Pearce, 2013).

Sample size. Generally minimum sample size guidelines revolve around those that specify a minimum (N), and those that specify a minimum sample size to number of variables ($N:p$) ratio (Bandalos & Boehm-Kaufman, 2009). Recent studies have concluded that there is no absolute N or $N:p$ ratio. (Hogarty, Hines, Kromrey, Ferron, & Mumford, 2005; MacCallum, Widaman, Zhang, & Hong, 1999). Rather, when communalities are high sample size has less of an influence on factor solutions (Hogarty et al.; MacCallum et al.). In addition to higher communality levels, accuracy has also been shown to increase with a decreased number of factors, more variables/factor (i.e. over-determination), and larger sample sizes (Hogarty et al.; MacCallum et al.). Smaller samples should be sufficient if solutions have several high loading marker variables ($> .80$; Tabachnick & Fidell, 2013).

Extraction method selection. Multiple extraction methods were considered. CFA was deemed inappropriate given the study's exploratory nature, and the inability to accurately specify which variables load on which factors, or even the number of factors (Schmitt, 2011). Similarly, due to the requirement of imposing/specifying the number of factors, the options of using unweighted least-squares and generalised least-squares EFA factor extraction methods were eliminated. The EFA factor extraction method of Maximum Likelihood was also rejected due to it requiring a normally distributed data set (Schmitt).

Thus, the final two options under consideration were PCA and the EFA extraction method of iterative PAF, neither of which have data distribution assumptions (Schmitt, 2011). The difference between PCA and PAF is their handling of unique variance. PCA includes all the variance, including unique variance, i.e. it assumes no measurement error and that the test was perfectly reliable. Whereas PAF only analyses the common/shared variance, i.e. it attempts to account for measurement error by attempting to exclude unique variance from the analysis (Bryman & Cramer, 1990; Schmitt). In other words, the goal of PCA is data reduction, whereas PAF aims to describe variables in terms of a smaller number of underlying dimensions and uncover the latent constructs underlying the variables in an attempt to understand the nature of such constructs (Bandalos & Boehm-Kaufman, 2009). Ultimately iterative PAF was selected as it affords the advantage of operating under the common factor model, thus taking into account measurement error (Schmitt).

Factor retention. Generally speaking the ideal solution is parsimonious and open to clear interpretation. A simple structure enables easy interpretation, and reproducibility (Franco, 2013). Each factor should be highly saturated on some variables, with remaining variables having little to no saturation. Factor retention is important as over or under factor retention can result in significant modelling error (Schmitt, 2011). EFA procedures require the researcher to decide how many factors to retain, and which, if any, items to exclude. The first step in the factor retention process is examination of each instrument's factorability. Items with communalities less than .3 are excluded from subsequent FA since they may be unrelated to the others. Next, a FA including the remaining items provides an indication of the potential factor solutions. Further FA for each potential solution enables comparison of how items load together on different factors from each solution. Next, the preferred factor solution is selected based on the Kaiser criterion and the scree test, how much theoretical support the solution has, and the strength of primary factor loadings. Then items with primary factor loadings less than .4 or cross-loadings of above .3 are removed (Matsunga, 2010). A final FA of the remaining items checks that primary factor loadings exceed .4 and cross-loadings are below .3.

Factor rotation. The goal of factor rotation is to obtain the most parsimonious and easiest to interpret set of factors (Bandalos & Boehm-Kaufman, 2009; Schmitt, 2011). Factors are rotated in order to maximise the loadings of some items, and increase the interpretability for the factors (Bandalos & Boehm-Kaufman; Bryman & Cramer, 1990). Orthogonal (uncorrelated) or oblique (correlated) are two basic rotation methods. The oblique rotation method of Direct Oblim was adopted. An oblique solution will default to an orthogonal solution if the factors really are uncorrelated, but also allows for the factors to be correlated (Bandalos & Boehm-Kaufman). Moreover, oblique rotation methods generally result in more realistic and more statistically sound factor structures (Schmitt). Furthermore, an oblique rotation is most suitable for the analysis of psychological factors, such as those assessed in this study, which are expected to be correlated (Gaskin & Happell, 2014).

Instrument reliability analysis. The internal consistencies of psychological construct instruments, including only those items retained in the final FA, were tested

to check that Cronbach's alphas exceeded the recommended value of .8 (Gliem & Gliem, 2003).

Differences between groups. Changes in *participation* following the *transition* were analysed using paired-samples *t*-tests, Wilcoxon signed-rank tests (frequency and duration), and McNemar tests (types of physical activity). Independent samples *t*-tests and Mann-Whitney *U* tests examined differences in *participation* and *psychological constructs* based on participation levels and socio-demographic variables.

Relationships between variables. Correlation tests were conducted between *participation* variables to examine the direction and strength of linear relationships (Pallant, 2013). Multiple regression (forced entry method) was used to determine how well the *psychological constructs*, and their factors, predicted *participation* duration.

3.8. Qualitative Data Analysis

Thematic analysis was conducted to identify the dominant themes and sub-themes in qualitative data collected from open-ended questions. Though questions pertained to specific areas of interest, analysis was conducted within a constructionist framework that considered responses by individuals across the whole data set to enable inclusion of individual accounts within the context of sociocultural and structural conditions (Braun & Clarke, 2006). An inductive, rather than theoretical, approach was adopted to allow themes to develop without trying to fit them into a pre-existing coding frame (Ezzy, 2002).

The analytical approach followed guidelines by Braun and Clarke (2006). Braun and Clarke provide a six-step guide for researchers conducting a thematic analysis. Data was already in text form so no transcription was required. First, participants' responses were read to enable the researcher to become familiar with the data. During the process of open (exploratory) coding, participant responses were re-read many times to generate the initial set of codes, before codes were then collated into potential themes. Next, via axial coding, related codes were integrated around axes of higher-order central themes. Finally, selective coding identified core themes around which the analysis occurred (Ezzy, 2002), as well as sub-themes within those higher level themes (Braun & Clarke). The identified importance of themes was based on

whether they captured something key to the central research questions (Braun & Clarke).

3.9. Conclusion

A component mixed-methods approach was adopted to most effectively achieve this study's two aims. Following a pilot test, an online questionnaire was distributed and promoted to first-year students from a medium-sized NZ university following students' end-of-year exams. Respondents were presented with the opportunity to enter a prize draw upon completion of the questionnaire. The underlying structures of motive, negotiation, and constraint instruments were analysed using PAF. Differences between groups were explored using complementary parametric and non-parametric techniques, and relationships between variables were explored using parametric techniques. Thematic analysis identified the dominant themes and sub-themes in qualitative data.

Chapter 4: Results

This chapter is a presentation of the results of the data analyses. The first section outlines the procedures implemented to handle missing data. Next, descriptive statistics regarding participant characteristics are reported. The remaining results are reported in four separate sections: (1) *participation*, (2) motives, (3) negotiation, and (4) constraints. The motives, negotiation, and constraints sections begin with a brief overview of instrument analyses including PAF factorability, PAF, and reliability analysis results. Descriptive statistics are also reported in each section. Next, results of statistical analyses of differences between groups of participants categorised by socio-demographic variables (gender, living situation, disability status, employment status, and volunteering status) are reported. Results of correlation and multiple regression analyses used to examine relationships between variables are then reported. Unless otherwise stated, all results were calculated using the complete data set without removal of any outliers. The final results section reports the results of qualitative data analysis.

4.1. Missing Data

Socio-demographic data provided by Enrolment Services was complete, and was matched with participant responses using student ID numbers. Fifteen participants (12%) did not answer the open-ended questions relating to transition effects, but were not excluded, as non-responses to these questions had no influence on the analysis of responses to other quantitative questions.

When responding to *psychological construct* instrument items participants could indicate that they did not understand the item by selecting a '?' option, which pilot study participants verbally affirmed they had correctly comprehended the meaning of. Such responses were interpreted as missing data. The majority of participants understood all items. Seventeen participants had exactly one item they did not understand, and an additional six did not understand multiple items. No item had more than four missing values.

The missing data of the twenty-three participants needed to be replaced in order to avoid multiple participants being excluded from various analyses. A popular approach to handle missing data is value imputation (Huisman, 2000). Missing

responses were replaced using the prior knowledge scheme (Tabachnick & Fidell, 2013), guided by the person mean (i.e. participants' responses on other related items) and/or gender item mean (i.e. the item's mean value for the participant's gender) (Huisman). Item gender means rather than the overall item means were imputed to replace values with those similar to the participant's characteristics (Donders, van der Heijden, Stijnen, & Moons, 2006). Gender was chosen as the differentiating variable as result of inspection of descriptive statistics prior to value imputation revealed large variations in gender means, and previous research has reported significant gender differences between items measuring these constructs. Finally, individual participant responses were visually inspected for abnormal patterns.

4.2. Participant Characteristics

The overall mean age, and mean age of male and female participants separately was 18.72 years ($SD = 0.45$). Only two participants (one male, one female) were international students, the remainder were domestic students. The majority of participants resided in university accommodation (59.5%). Nearly a quarter of participants lived in their parents'/guardians' home. Engineering students were best represented, most of whom were male (67.9%). Of the eleven participants (9.1%) with a physical disability nine were female (Table 3).

Table 3: *Participant Characteristics*

	Demographics	Participants (<i>n</i> = 121)	
		Frequency	Percentage
Gender	Male	61	50.4
	Female	60	49.6
Ethnicity	NZ European/Pakeha	88	72.7
	NZ European/Pakeha & NZ Māori	15	12.4
	NZ European/Pakeha & Pasifika	6	5.0
	Asian	8	6.6
	Other	4	3.3
University Faculty	Arts	15	12.4
	Education	7	5.8
	Engineering	53	43.8
	Commerce	18	14.9
	Law	6	5.0
	Science	22	18.2
Living situation	University Accommodation	72	59.5
	Flatting	12	9.9
	Parental/Guardians home	32	23.4
	Own Home	3	2.5
	Home stay	2	1.7
Physical disability		11	9.1
First in family		35	28.9
Employed		49	40.5
Volunteer		45	37.2

4.3. Participation

Descriptive participation statistics. Results indicate an overall decrease in *participation* frequency and duration following the *transition*. There was also a decrease in the prevalence of participation in more competitive forms of sport, such as club and representative sport. Informal sport participation remained stable, whereas the prevalence of participation in gym and fitness activities increased slightly (Table 4).

Table 4: *Secondary School and Tertiary Participation*

	Secondary school	Tertiary
Participation frequency, times/week (<i>M (SD)</i>)	4.97 (2.88)	3.50 (2.42)
Participation duration, hours/week (<i>M (SD)</i>)	9.22 (6.27)	5.84 (5.28)
Informal sport (%)	59.5	59.5
School sport team (%)	76.0	-
University sport clubs (%)	-	28.1
External sport clubs (%)	42.1	20.7
Representative sport (%)	27.3	9.1
Gym and fitness activities (%)	54.5	64.5
University sport competitions (%)	-	39.7

Changes in participation following the transition. Reported changes in *participation* following the *transition* were analysed to determine whether they were statistically significant. Changes in *participation* frequency, duration, and breadth; levels of insufficient participation; and, changes in types of physical activity, were all found and are reported below.

Paired-samples *t*-tests and Wilcoxon signed-rank tests showed statistically significant decreases in both *participation* frequency and duration following the *transition* (Table 5). *Participation* breadth, the mean number of physical activities and sports participated in, was also shown to decrease significantly from .52 (*SD* = .24) to .37 (*SD* = .22) following the *transition* ($p < .001$, $\eta^2 = 0.35$).

Table 5: *Changes in Participation Frequency and Duration*

	Statistic	Secondary school	Tertiary	Decrease (%)	<i>p</i>	Effect size
Participation frequency, times/week	<i>M (SD)</i>	4.97 (2.88)	3.50 (2.42)	29.6	< .001	$\eta^2 = 0.25$
	<i>Md</i>	5.00	3.00	40.0	< .001	$r = .52$
Participation duration, hours/week	<i>M (SD)</i>	9.22 (6.27)	5.84 (5.28)	36.7	< .001	$\eta^2 = 0.28$
	<i>Md</i>	8.00	5.00	37.5	< .001	$r = .54$

Participants were classified as insufficiently active if their weekly participation duration was less than 150min, the level of weekly moderate physical activity recommended by the NZ MoH (2015) for adults. A McNemar test, a non-parametric

repeated measures analysis of changes in corresponding dichotomous variables (Pallant, 2013), revealed a statistically significant increase ($p = .024$) in the prevalence of 'insufficiently active' students following the *transition*, which rose from 15.7% at secondary school to 26.4% at university.

Changes in the prevalence of participation in different types of physical activities were examined by conducting a series of McNemar tests. Separate analyses were conducted by gender after identifying that participation in different types of physical activities varied by gender. No statistically significant changes in informal sport participation were found. By contrast, both genders showed a statistically significant decrease in participation in external sport clubs and representative sport. The increase in participation in gym and fitness activities was not statistically significant. However, the increase in female participation in gym and fitness activities approached statistical significance, with more than half of secondary school non-gym and fitness activity participants initiating participation following the *transition*, and less than a quarter ceasing participation following the *transition* (Table 6).

Table 6: *Changes in Participation for Different Types of Physical Activity*

		Secondary school	Tertiary	p
Informal sport (%)	Male	62.3	65.6	.774
	Female	56.7	46.7	.815
External sport clubs (%)	Male	44.3	27.9	.006
	Female	40.0	13.3	.001
Representative sport (%)	Male	34.4	14.8	.002
	Female	20.0	3.3	.002
Gym and fitness activities (%)	Male	52.5	57.4	.549
	Female	56.7	71.7	.078

Participation in team secondary school sports did not directly translate into a tertiary participation category. However, of the tertiary types of physical activity secondary school sport participation only had a significant correlation with university sport competition participation ($r = .297$, $p = .001$, $r^2 = .088$). Further analyses revealed that this correlation was only significant for males ($r = .470$, $p < .001$, $r^2 = .221$), but not females ($r = .120$, $p = .362$, $r^2 = .014$).

Demographic participation differences. *Participation* differed significantly by gender, and living situation. Though not statistically significant, notable differences in *participation* emerged in relation to disability status and employment status.

Gender. The only significant differences revealed by gender were that more males were external sport club members and participated in more representative sport than females (Table 7).

Table 7: *Tertiary Participation Gender Differences*

	Males	Females
Participation frequency, times/week (<i>M (SD)</i>)	3.51 (2.41)	3.48 (2.33)
Participation duration, hours/week (<i>M (SD)</i>)	6.48 (5.41)	5.18 (5.09)
Informal sport (%)	65.6	53.3
University sport clubs (%)	23.0	33.3
External sport clubs* (%)	27.9	13.3
Representative sport* (%)	14.8	3.3
Gym and fitness activities (%)	57.4	71.7
University sport competitions (%)	42.6	36.7

* $p < .05$

Living situation. University accommodation residents and non-residents reported similar *participation* rates and durations. However, university accommodation residents were significantly more likely to have participated in university sport competitions (56.9%) compared to non-residents (14.3%), $\chi^2 (1 n = 121) = 20.42, p < .001, phi = -.428$.

Disability status. Differences in the *participation* frequency and duration of able-bodied and disabled participants were not statistically significant. However, compared to those who did not report a disability, those who did participated in nearly one and half more hours/week (disability: $M = 7.18, SD = 4.43$; no disability: ($M = 5.70, SD = 5.35$) despite reporting just under half a session/week more (disability: $M = 3.91, SD = 1.45$; no disability: $M = 3.45, SD = 2.49$).

Employment and volunteering status. *Participation* duration and frequency did not differ significantly based on employment or volunteering status, yet the frequency and duration of the employed and volunteers was greater than the unemployed and non-volunteers respectively (Table 8).

Table 8: *Differences in Participation Frequency and Duration based on Employment and Volunteering Status*

	Statistic	Participation frequency	Participation duration
Employed	<i>M (SD)</i>	3.69 (2.56)	6.86 (6.18)
Unemployed	<i>M (SD)</i>	3.36 (2.32)	5.15 (4.48)
Volunteers	<i>M (SD)</i>	3.86 (2.60)	6.66 (5.49)
Non-volunteers	<i>M (SD)</i>	3.27 (2.29)	5.36 (5.12)

Relationship between secondary and tertiary participation. Although data was not normally distributed and scatter plot inspection revealed a number of outliers for *participation* frequency and duration, correlation analyses were conducted without transforming data or removing outliers. Significant correlations existed between secondary and tertiary *participation*: frequency ($r = .542$, $N = 121$, $p < .001$, $r^2 = .294$), duration ($r = .558$, $N = 121$, $p < .001$, $r^2 = .311$), and breadth ($r = .611$, $N = 121$, $p < .001$, $r^2 = .373$).

Relationship between type of physical activity and duration. The model including the six types of physical activities and sports predicted 38.2% (adjusted $r^2 = .382$) of the variance in *participation* duration $F(6, 114) = 13.352$, $p < .001$. However, only participation in representative sport and gym and fitness activities were significant predictors of *participation* duration (Table 9).

Table 9: *Unstandardised and Standardised Regression Coefficients for Types of Physical Activity in Relation to Tertiary Participation Duration*

Variable	<i>B (SE)</i>	<i>B</i>	<i>t</i>	<i>p</i>
Informal sport	.491 (.817)	.046	.549	.549
University sport clubs	.935 (.898)	.080	.300	.300
External sport clubs	1.293 (1.089)	.100	1.041	.238
Representative sport	9.539 (1.526)	.522	6.250	.000
University sport competitions	.979 (.808)	.091	1.212	.228
Gym and fitness activities	1.719 (.809)	.157	2.125	.036

Relationship between participation and psychological constructs. Standard multiple regression analyses were conducted to determine the predictability of *participation* duration based on *psychological constructs*. The mean of items retained following FA of each construct was used as the variable for analysis. Six cases that

exceeded critical values were deleted following the first two analyses. The model including the three *psychological constructs* components predicted 32.8% (adjusted $r^2 = .328$) of the variance in *participation* duration $F(3, 111) = 19.553, p < .001$. Negotiation and constraints made significant contributions to the model. Motives did not significantly predict *participation* duration (Table 10).

Table 10: *Unstandardised and Standardised Regression Coefficients for Motives, Negotiation, and Constraints in relation to Tertiary Participation Duration*

Psychological construct	<i>B</i> (<i>SE</i>)	β	<i>t</i>	<i>p</i>
Motives	-.394 (.426)	-.080	-.927	.356
Negotiation	2.287 (.335)	.588	6.830	< .001
Constraints	-.884 (.310)	-.210	-2.722	.008

Though motives did not significantly predict *participation* duration, the correlation matrix showed that motives had a significant positive correlation with both negotiation and *participation* duration (Table 11).

Table 11: *Participation Duration, Motives, Negotiation, and Constraints Correlation Matrix*

	Participation Duration	Motives	Negotiation	Constraints
Participation Duration	1.00	.235*	.512**	-.172
Motives		1.00	.450**	.045
Negotiation			1.00	.023

* $p < .01$, ** $p < .001$

Partial correlation was used to explore the relationship between motives and *participation* duration whilst controlling for negotiation. The relatively weak zero-order correlation between motives and *participation* duration disappeared when controlling for negotiation, $r = .006, p = .946$. This suggests that in the present study negotiation mediates the relationship between motives and *participation*.

Results for the analysis of the relationship between the factors of each construct and tertiary *participation* duration are reported in the respective construct sections.

4.4. Motives

Instrument analysis. Initially, the factorability of the 19 motive items was examined. Several well-recognised criteria for the factorability of a correlation were used. All items correlated at least .3 with at least one other item, suggesting reasonable factorability. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .829, above the recommended value of .6, and the Bartlett's test of sphericity was significant ($\chi^2 (171) = 1232.32, p < .001$). All diagonals of the anti-image correlation matrix also exceeded .5. Finally, the communalities were all above .3, except for the 'prevention or recovery from illness/injury' item which was removed from subsequent FA since it may be unrelated to the other items. Given these overall indicators, FA was deemed to be suitable with the remaining 18 items.

Initial eigenvalues indicated that five factors explained 36.0%, 11.8%, 11.1%, 7.5%, and 6.5% of the variance respectively. Three, four, and five factor solutions were examined. The five-factor solution was preferred because items loaded together on factors that had previous theoretical support, and the eigenvalues inflected, i.e. leveled off, on the scree plot after five factors (Yong & Pearce, 2013). Two items were eliminated from subsequent FA due to cross-loadings of .3 or above (Matsunga, 2010). These items were the 'enjoyment' and 'competition' items that both loaded above .4 on the competence-mastery, and interpersonal factors. The 'gain a sense of belonging' item had a primary factor loading of .54 on the interpersonal factor, and a secondary factor loading of .34 on the social recognition factor but was retained for the next stage of analysis.

A final FA of the remaining 16 items was conducted. All items had primary loadings over .5 with the exception of the 'invigoration/revitalisation' item that had a primary loading of only .44. No item had cross-loadings above .3. The five factors explained 34.3%, 11.3%, 8.1%, 6.4%, and 4.9% of the variance respectively, and can be thought of as representing different motive dimensions: (1) competence-mastery; (2) social recognition; (3) body/health-related; (4) psychological; and, (5) interpersonal (Table 12).

Factors are consistent with the LMS (Beard & Ragheb, 1983), and EMI-2 (Markland & Ingledew, 1997). The competence-mastery factor is consistent with the same LMS dimension that also included fitness, challenge, and skill acquisition items

(Beard & Ragheb). The social recognition factor is consistent with the same EMI-2 dimension (Markland & Ingledew). The body/health-related factor has the least conceptual support, but contains the appearance, weight management, and health related items which each represent separate EMI-2 dimensions (Markland & Ingledew). The psychological factor encompasses items concerning relaxation, escape, stress management, and revitalisation, which each represent separate EMI-2 dimensions (Markland & Ingledew), and are items encompassed by the LMS stimulus-avoidance dimension (Beard & Ragheb). The factor was named psychological, as avoidance was considered too strong. Finally, the interpersonal factor is consistent with the affiliation and social dimensions of the EMI-2 (Markland & Ingledew) and LMS (Beard & Ragheb) respectively. The remaining EMI-2 dimensions (enjoyment, competition, health pressures, and ill-health avoidance) were represented by items (enjoyment, competition, and prevention or recovery from illness/injury) that were excluded during FA, potentially due to poor wording, and/or representing an additional factor in their own right as discussed below further in chapter five.

Factors were positively correlated with one another except for the psychological factor, which had a negative correlation with the others (Table 13). The 16 retained items demonstrated acceptable reliability. A Cronbach's alpha ($\alpha = .876$) indicated a high level of internal consistency (Gliem & Gliem, 2003), and the deletion of no item would improve the Cronbach's alpha.

Table 12: *Motives Factor Loading Matrix*

Item	Pattern coefficients					Structure coefficients					Communalities (extraction)
	1	2	3	4	5	1	2	3	4	5	
3. Strength and endurance	.784	-.136	.233	.024	-.017	.823	.019	.437	-.410	.173	.732
1. Personal challenge	.758	-.071	-.052	-.132	-.164	.773	.134	.227	-.442	.083	.628
4. Speed, agility and flexibility	.741	.033	.079	.055	.126	.776	.184	.323	-.374	.323	.627
2. Improve and learn new skills and abilities	.666	.071	-.145	-.089	.143	.710	.188	.141	-.412	.338	.551
18. To gain recognition for my accomplishments	-.047	.857	.087	-.131	.017	.166	.900	.333	-.300	.328	.837
19. To gain the respect of others	.074	.794	.047	.098	.054	.164	.815	.237	-.114	.302	.676
16. Weight management	.040	.154	.791	.052	-.118	.257	.306	.802	-.252	.058	.672
17. Physical appearance/attractiveness	-.059	.044	.716	-.077	.061	.227	.244	.747	-.340	.203	.571
14. Balanced/healthy lifestyle attainment	.201	-.111	.587	-.185	.164	.503	.145	.720	-.527	.333	.659
7. Physical and mental relaxation	-.096	-.039	-.008	-.976	.009	.369	.124	.314	-.922	.261	.860
6. Stress management	.114	.043	.004	-.697	-.120	.426	.146	.288	-.725	.130	.546
8. Escape from everyday life responsibilities	.048	.031	.061	-.620	.186	.418	.223	.344	-.726	.402	.573
13. Invigoration/revitalisation	.214	.002	.198	-.444	.124	.523	.199	.451	-.657	.344	.536
10. Meet new people/make new friends	.129	.124	.141	.001	.841	.369	.372	.071	-.281	.889	.824
9. Spend time with friends	.002	-.090	.070	.004	.727	.197	.156	.169	-.223	.710	.514
11. Gain a sense of belonging	-.071	.240	.051	-.099	.624	.186	.457	.228	-.313	.719	.588

Note. Bold indicates that respective items loaded on the respective factors

Table 13: *Motives Factor Correlation Matrix*

Factor	2	3	4	5
1	.137	.317	-.482	.256
2		.244	-.180	.315
3			-.370	.167
4				-.297

Descriptive motives statistics. The strongest motive was enjoyment, followed by balanced/healthy lifestyle attainment, and strength and endurance. The weakest motives were gaining recognition for one's accomplishments, prevention or recovery from illness/injury, and the gain of others' respect (Table 14).

Table 14: *Participation Motive Strength*

	<i>M (SD)</i>
Competence-mastery	5.37 (1.24)
Strength and endurance	5.69 (1.45)
Personal challenge	5.27 (1.59)
Speed, agility and flexibility	5.34 (1.47)
Improve and learn new skills and abilities	5.20 (1.48)
Social recognition	3.52 (1.65)
To gain the respect of others	3.60 (1.74)
To gain recognition for personal accomplishments	3.45 (1.80)
Body/health related	5.10 (1.46)
Weight management	4.73 (1.95)
Physical appearance/attractiveness	4.83 (1.80)
Balanced/healthy lifestyle attainment	5.74 (1.40)
Psychological	5.12 (1.33)
Physical and mental relaxation	5.21 (1.62)
Stress management	5.23 (1.67)
Escape from everyday life responsibilities	4.83 (1.80)
Invigoration/revitalisation	5.21 (1.36)
Interpersonal	4.48 (1.46)
Spend time with friends	5.14 (1.72)
Meet new people/make new friends	4.43 (1.73)
To gain a sense of belonging	3.87 (1.70)
Other motives	
Enjoyment	5.98 (1.39)
Competition	5.18 (1.81)
Prevention or recovery from illness/injury	3.55 (1.72)

Motive variation based on participation. Analyses revealed significant differences in motive strength based on *participation* level and type of physical activity. Firstly, a number of statistically significant differences were found between

insufficiently active (*participation* duration < 150min/week) and active (*participation* duration \geq 150min/week) participants. Compared to insufficiently active participants, active participants reported significantly stronger interpersonal motives; as well as significant differences based on the ‘meet new people’, ‘escape’, ‘enjoyment’, and ‘prevention or recovery from illness/injury’ items (Table 15).

Table 15: *Motive Differences between Insufficiently Active and Active Participants*

Motives	Statistic	Insufficiently active	Active	<i>p</i>	Effect size (η^2/r)
Overall	<i>M (SD)</i>	4.54 (1.07)	5.02 (0.90)	.016	.048
	<i>Md</i>	4.68	5.12	.010	.235
Interpersonal	<i>M (SD)</i>	4.02 (1.58)	4.64 (1.39)	.038	.036
	<i>Md</i>	4.00	5.00	.056	.174
Meet new people/ make new friends	<i>M (SD)</i>	3.75 (1.59)	4.67 (1.72)	.009	.056
	<i>Md</i>	4.00	5.00	.010	.236
Escape	<i>M (SD)</i>	4.25 (1.98)	5.04 (1.69)	.032	.038
	<i>Md</i>	4.50	5.00	.046	.181
Enjoyment	<i>M (SD)</i>	5.56 (1.50)	6.12 (1.33)	.050	.032
	<i>Md</i>	6.00	7.00	.016	.219
Prevention or recovery from illness/injury’	<i>M (SD)</i>	3.03 (1.84)	3.74 (1.65)	.045	.033
	<i>Md</i>	3.00	4.00	.030	.198

Secondly, motive strength differed significantly based on type of physical activity. Informal sport participants, and university sport competition participants, each reported significantly stronger interpersonal motives compared to non-participants. Interestingly, only university sport competition participants reported significantly stronger responses on the ‘to gain a sense of belonging’ item. University sport club members and university sport competition participants each reported significantly stronger social recognition motives compared to non-members/participants. Results suggest that different motives influence participation in gym and fitness activities compared to sporting activities, with gym and fitness activity participants reporting significantly stronger competence-mastery, body/health related, and psychological motives. In contrast, non-participants in gym and fitness activities reported significantly stronger responses on the ‘spend time with friends’ item compared to participants. In fact all social motive items were greater for non-gym and fitness activity participants compared to participants. Finally, participants in involved in

more competitive sporting activities reported significantly greater responses on the competition item compared to non-participants (**Appendix G**, Table 30).

Demographic motive differences. The only statistically significant difference in motive strength based on socio-demographic variables was by gender.

Gender. Overall motive strength was similar for both genders. However, females reported significantly stronger body/health related motives, largely due to significantly stronger responses in relation to the ‘weight management’ and ‘balanced/healthy lifestyle attainment’ items. Females also reported significantly stronger responses to the ‘stress management’ item, whereas males reported significantly stronger responses to the ‘enjoyment’ motive (Table 16).

Table 16: Motive Gender Differences

Motives		Male	Female	p	Effect
Body/health related	<i>M (SD)</i>	4.77 (1.38)	5.43 (1.46)	.012	.052
	<i>Md</i>	4.67	5.67	.003	.266
Weight management	<i>M (SD)</i>	4.20 (1.99)	5.27 (1.77)	.002	.076
	<i>Md</i>	4.00	6.00	.003	.273
Balance/healthy lifestyle attainment	<i>M (SD)</i>	5.54 (1.34)	5.93 (1.45)	.124	.025
	<i>Md</i>	6.00	6.00	.019	.214
Stress management	<i>M (SD)</i>	4.90 (1.84)	5.57 (1.42)	.028	.040
	<i>Md</i>	5.00	6.00	.049	.179
Enjoyment	<i>M (SD)</i>	6.13 (1.51)	5.82 (1.26)	.216	.013
	<i>Md</i>	7.00	6.00	.010	.232

Relationship between motives and participation. Standardised residuals displayed in the scatterplot were slightly weighted towards the right, or towards the agreement end of the Likert-scale, as expected given the positive nature of motives in conjunction with social desirability bias, i.e. “systematic error in self-report measures resulting from the desire of respondents to avoid embarrassment and project a favourable image to others” (Fisher, 1993, p. 303). The model including the five motive dimensions/factors predicted only 4.2% (adjusted $r^2 = .042$) of the variance in *participation* duration: $F(5, 115) = 2.062, p = .075$. Moreover, standardised β coefficients indicated that no motive factors made significant contributions to the prediction of *participation* duration (Table 17).

Table 17: *Unstandardised and Standardised Regression Coefficients for Motive Factors in relation to Tertiary Participation Duration*

Factor	<i>B (SE)</i>	β	<i>t</i>	<i>p</i>
Competence-mastery	.765 (.458)	.180	1.617	.097
Social recognition	.289 (.322)	.122	1.208	.230
Body/health related	-.355 (.383)	-.092	-.874	.384
Psychological	.166 (.453)	.042	.367	.714
Interpersonal	.368 (.369)	.102	.998	.321

4.5. Negotiation

Instrument analysis. Initially, the factorability of the 17 negotiation items was examined. Several well-recognised criteria for the factorability of a correlation were used. Firstly, all items correlated at least .3 with at least one other item, suggesting reasonable factorability. Secondly, the KMO measure of sampling adequacy was .804, above the recommended value of .6, and the Bartlett's test of sphericity was significant ($\chi^2 (136) = 939.88, p < .001$). All diagonals of the anti-image correlation matrix also exceeded .5. Finally, the communalities were all above .3, further confirming that the remaining items shared some common variance with other items. Given these overall indicators, FA was deemed to be suitable for all 19 items.

Initial eigenvalues indicated that five factors explained 35.3%, 11.1%, 10.6%, 6.6%, and 6.1% of the variance respectively. Solutions for three, four, and five factors were examined. The three-factor solution was preferred because items loaded together on factors that had previous theoretical support, and the eigenvalues all exceeded one and inflected, i.e. leveled off, on the scree plot after three factors (Yong & Pearce, 2013). Four items were eliminated from subsequent FA due to having a primary factor loading of less than .4. These items were 'skill acquisition', 'transport arrangement', 'participation in less competitive activities', and 'participation in less expensive activities'. Another item, 'information acquisition' was also eliminated due to cross-loadings above .3 (Matsunga, 2010).

A final FA of the remaining 12 items was conducted. All items had primary loadings over .5, and none had cross-loadings above .3. The three factors explained 34.7%, 12.0%, and 9.5% of the variance respectively, and can be thought of as representing different negotiation strategy dimensions: (1) well-being management; (2) interpersonal; and, (3) time prioritisation and financial management (Table 18).

Despite the lack of negotiation instrument FA in the existing literature, factors approximate those previously proposed. Well-being management was considered a more apt title for the factor previously called physical fitness (Yerlisu-Lapa, 2014), and also included the personal organisation item previously assumed to be a part of a time management factor (Beggs et al., 2005; Elkins et al., 2007). Like previous studies, an interpersonal dimension emerged, but with two key differences. Firstly, the inverted 'participate with the opposite gender' item was included, and the reworded 'transport arrangement' item was removed from FA due to a low factor loading. The third factor included items that had previously been assumed (Beggs et al.; Elkins et al.) and shown to (Yerlisu-Lapa) load on separate time management and financial management factors. Had more time and financial related items been included, items may have loaded on two separate factors. Nevertheless, these items loading on the same factor makes sense conceptually as both time and money are finite resources individuals must consider when determining their participation. Moreover, previous studies have shown that grouping such items together provides a better statistical fit (Guo & Scheider, 2015).

The factor correlation matrix showed that the interpersonal strategies factor was negatively correlated with the others, which were positively correlated with one another (Table 19). The instrument containing the 12 retained items demonstrated acceptable reliability. A Cronbach's alpha ($\alpha = .850$) indicated a high level of internal consistency (Gliem & Gliem, 2003) and the deletion of no item would improve the Cronbach's alpha.

Table 18: *Negotiation Factor Loading Matrix*

Item	Pattern coefficients			Structure coefficients			Communalities (extraction)
	1	2	3	1	2	3	
14. Increased sleep	.837	.086	-.066	.787	-.149	.196	.633
13. Eating habit improvement	.762	.034	.073	.777	-.231	.328	.608
12. Physical fitness improvement	.653	-.189	.180	.775	-.460	.482	.680
1. Effective personal organisation	.511	-.270	.029	.605	-.440	.312	.438
8. Encouragement of friends and others to participate	.070	-.911	-.105	.316	.893	.265	.808
9. Coordination of participation with friends	.107	-.767	-.056	.326	-.780	.272	.618
10. Participation with the opposite gender	-.170	.751	.104	.100	-.737	.329	.571
7. Willing participation with strangers	.060	-.601	.115	.287	-.663	.364	.457
6. Acquired a job to earn money to participate	-.036	-.020	.736	.230	-.288	.731	.536
4. Attempted to budget money to participate	-.035	-.045	.734	.209	-.222	.704	.499
2. Cut short time for social commitments	-.011	-.098	.630	.241	-.333	.663	.447
3. Cut short time on studies	.232	.048	.573	.419	-.242	.637	.451

Note. Bold indicates that respective items loaded on the respective factors

Table 19: *Negotiation Factor Correlation Matrix*

Factor	2	3
1	-.311	.352
2		-.379

Descriptive negotiation statistics. The most frequently used strategies were encouragement of friends and others to participate, participation with the opposite gender, and physical fitness improvement. The least frequently used strategies were acquiring a job to earn money, budgeting money, and cutting short study commitments (Table 20).

Table 20: *Negotiation Frequency*

	<i>M (SD)</i>
<i>Well-being management</i>	4.28 (1.41)
Physical fitness improvement	4.91 (1.84)
Eating habit improvement	3.89 (1.79)
Increased sleep	3.66 (1.73)
Effective personal organisation	4.68 (1.62)
<i>Interpersonal</i>	4.75 (1.59)
Encouragement of friends and others to participate	4.97 (1.88)
Coordination of participation with friends	4.78 (1.91)
Participation with the opposite gender	4.95 (1.84)
Willing participation with strangers	4.29 (2.05)
<i>Time prioritisation and financial management</i>	2.96 (1.35)
Cut short time for social commitments	3.46 (1.58)
Cut short time on studies	3.17 (1.69)
Attempted to budget money to participate	2.90 (1.84)
Acquired a job to earn money to participate	2.29 (1.84)
<i>Other negotiation items</i>^a	
Information acquisition	4.22 (1.98)
Skill acquisition	4.56 (1.74)
Transport arrangement	3.61 (2.18)
Participation in less expensive activities	4.01 (2.02)
Participation in less competitive activities	4.69 (2.20)

^a Excluded from FA

Negotiation variation based on participation. The frequency of use of various negotiation strategies varied significantly based on participation level and type of physical activity. Firstly, both parametric (*t*-tests) and non-parametric (Mann-Whitney

U tests) analyses revealed corresponding statistically significant differences in negotiation frequency between insufficiently active and active participants on each factor and most items. The results of parametric analyses are displayed in Table 21.

Table 21: *Negotiation Differences between Insufficiently Active and Active participants*

Negotiation strategies	Insufficiently active <i>M (SD)</i>	Active <i>M (SD)</i>	<i>p</i>	η^2
Overall	2.96 (1.09)	4.37 (0.85)	< .001	.319
<i>Well-being management</i>	3.15 (1.46)	4.69 (1.15)	< .001	.235
Physical fitness improvement	3.31 (1.75)	5.48 (1.49)	< .001	.273
Eating habit improvement	2.78 (1.62)	4.29 (1.68)	< .001	.140
Increased sleep	2.84 (1.83)	3.96 (1.60)	.002	.081
Effective personal organisation	3.66 (1.77)	5.04 (1.40)	.001 ^b	.119
<i>Interpersonal</i>	3.67 (1.72)	5.13 (1.35)	< .001 ^b	.137
Encouragement of friends and others to participate	3.81 (2.07)	5.38 (1.62)	< .001 ^b	.112
Coordination of participation with my friends	3.63 (2.01)	5.19 (1.71)	< .001 ^b	.115
Participation with the opposite gender	4.03 (2.04)	5.28 (1.66)	.001	.090
Willing participation with strangers	3.22 (2.06)	4.67 (1.91)	< .001	.099
<i>Time prioritisation and financial management</i>	2.05 (0.97)	3.28 (1.32)	< .001 ^b	.208
Cut short time for social commitments	2.31 (1.06)	3.88 (1.54)	< .001 ^b	.250
Cut short time on studies	2.19 (1.26)	3.53 (1.69)	< .001 ^b	.157
Attempted budgeting of money to participate	2.22 (1.62)	3.15 (1.86)	< .014	.050
Acquired a job to earn money to participate	1.47 (0.95)	2.58 (1.99)	< .001 ^b	.124
<i>Other negotiation items</i>^a				
Information acquisition	3.28 (2.17)	4.56 (1.80)	.004 ^b	.070
Skill acquisition	3.31 (1.75)	5.01 (1.50)	< .001	.188
Transport arrangement	2.69 (2.12)	3.94 (2.11)	.005	.065
Participation in less expensive activities	3.72 (2.10)	4.11 (2.00)	.347	.007
Participation in less competitive activities	3.72 (2.10)	4.11 (2.00)	.392	.006

^a Excluded from FA

^b Equal variances not assumed

Secondly, negotiation frequency differed significantly based on type of physical activity. With the exception of representative sport, participants in each type of physical activity reported using interpersonal strategies significantly more frequently than non-participants, though differences in items encompassed by the interpersonal

dimension varied between activities. Participants in more competitive forms of sport (university sport clubs, external sport clubs, and representative sport) reported using time prioritisation and financial management strategies significantly more frequently compared to non-participants. Finally, gym and fitness activity participants reported using well-being management strategies significantly more frequently, as did external sport club members. Non-representative sport participants and university sport competition participants reported significantly higher responses on the 'participated in less competitive activities' item. Representative sport participants and external sport club members reported significantly higher responses on the transport arrangement item. Finally, information acquisition and skill acquisition items also differed significantly between non-participants and participants in several categories (**Appendix G**, Table 31).

Demographic negotiation differences. Statistically significant differences in negotiation frequency were revealed based on living situation, disability status, employment status, and volunteering status. No gender differences were discovered.

Living situation. Compared to those in other living situations, university accommodation residents significantly more frequently participated with the opposite gender ($p = .037$, $\eta^2 = .036$, equal variances not assumed), and participated in less competitive activities ($p = .018$, $\eta^2 = .046$).

Disability status. Both parametric and non-parametric analyses showed that compared to those uninhibited by a disability, those inhibited by a disability reportedly significantly more frequently: improving physical fitness (t-test: $p = .040$, $\eta^2 = .041$, equal variance not assumed; Mann Whitney U : $p = .037$, $r = .190$); improving eating habits (t-test: $p = .012$, $\eta^2 = .052$; Mann Whitney U : $p = .032$, $r = .195$); and, coordinating participation with friends (t-test: $p = .032$, $\eta^2 = .035$; Mann Whitney U : $p = .032$, $r = .195$).

Employment/volunteering status. Compared to the unemployed, the employed significantly more frequently improved both their physical fitness and eating habits, and acquired a job to earn money to participate. In contrast, the unemployed significantly more frequently participated in less competitive activities (Table 22).

Table 22: *Negotiation Differences Based on Employment Status*

Negotiation strategies		Unemployed	Employed	<i>p</i>	Effect size (η^2/r)
Physical fitness improvement	<i>M (SD)</i>	4.65 (1.81)	5.29 (1.84)	.063	.029
	<i>Md</i>	5.00	6.00	.037	.190
Eating habit improvement	<i>M (SD)</i>	3.63 (1.70)	4.29 (1.86)	.046	.033
	<i>Md</i>	4.00	4.00	.039	.188
Time prioritisation and financial management strategies	<i>M (SD)</i>	2.63 (1.14)	3.43 (1.50)	.002 ^a	.079
	<i>Md</i>	2.50	3.25	.003	.270
Acquired a job to earn money to participate	<i>M (SD)</i>	1.60 (1.16)	3.31 (2.17)	.001 ^a	.176
	<i>Md</i>	1.00	3.00	.000	.470
Participated in less competitive activities	<i>M (SD)</i>	5.04 (2.15)	4.18 (1.20)	.035	.037
	<i>Md</i>	6.00	5.00	.026	.203

^a Equal variances not assumed

Volunteers reported significantly more frequently participating in less expensive activities than non-volunteers (*t*-test: $p = .017$, $\eta^2 = .047$; Mann-Whitney *U* test: $p = .018$, $r = .215$).

Relationship between negotiation and participation. Standardised residuals displayed in the scatterplot were slightly weighted towards the right, the more frequent end of the Likert-scale, consistent with previous research, as expected given the positive nature of negotiation in conjunction with social desirability bias (Fisher, 1993). Seven cases that exceeded critical values were deleted following the first three analyses, before the fourth analysis produced a model without any outliers. The model including the three negotiation factors/dimensions predicted 40.7% (adjusted $r^2 = .407$) of the variance in *participation* duration $F(3, 110) = 26.407$, $p < .001$. Well-being management, and time prioritisation and financial management factors, but not the interpersonal factor, made significant contributions to the model (Table 23). Although the contribution of the interpersonal factor to the model was not significant, it still had a significant positive correlation with *participation* duration ($r = .409$, $p < .001$, $r^2 = .167$).

Table 23: *Unstandardised and Standardised Regression Coefficients for Negotiation Factors in relation to Tertiary Participation Duration*

Factor	<i>B (SE)</i>	β	<i>t</i>	<i>p</i>
Well-being management	.822 (.217)	.312	3.799	< .001
Interpersonal	.357 (.192)	.151	1.856	.066
Time prioritisation and financial management	1.062 (.233)	.369	4.563	< .001

4.6. Constraints

Instrument analysis. Time constraint items concerning employment and volunteering were excluded from FA due to being presented to only participants who were employed or did voluntary work. Initially, the factorability of the other 19 constraint items was examined. Several well-recognised criteria for the factorability of a correlation were used. Firstly, all items correlated at least .3 with at least one other item, suggesting reasonable factorability. Secondly, the KMO measure of sampling adequacy was .817, above the recommended value of .6, and the Bartlett's test of sphericity was significant ($\chi^2 (171) = 1123.84, p < .001$). All diagonals of the anti-image correlation matrix also exceeded .5. However, the communalities of four items 'university facilities are inconveniently located', 'a lack of time due to social commitments', 'a lack of time due to study commitments', and 'cultural beliefs' were below .3. As a result, these four items were removed from subsequent FA as they may not be related to the other items. Given these overall indicators, FA was deemed to be suitable for the remaining 15 items.

Initial eigenvalues indicated that four factors explained 37.2%, 15.0%, 10.3%, and 8.1% of the variance respectively. Solutions for three and four factors were examined. The three-factor solution was preferred because items loaded together on factors that had previous theoretical support, and the eigenvalues all exceeded one and inflected, i.e. leveled off, on the scree plot after three factors (Yong & Pearce, 2013). No items had cross-loadings above .3, but the 'lack of knowledge of where to participate' item had a primary factor loading of .386, below the recommended cutoff of .4 and was eliminated (Matsunga, 2010).

A final FA of the remaining 14 items was conducted. Only two items in this analysis had primary loadings less .5: 'inadequate university facilities', and 'health problems'. No item had cross-loadings above .3. The three factors explained 34.3%,

12.9%, and 8.2% of the variance respectively, and can be thought of as representing different dimensions of constraint: (1) structural; (2) intrapersonal; and, (3) interpersonal (Table 24).

Factors closely resemble those of CT (Crawford & Godbey, 1987; Crawford et al., 1991). The major departure from CT is that time constraints did not appear to share common variance with the other items. Moreover, even when time constraints were retained they loaded on the interpersonal rather than the structural factor. Low communalities can indicate that an additional factor, such as time, should be explored.

The factor correlation matrix showed structural constraints and intrapersonal constraints were positively correlated with one another, but negatively correlated with interpersonal constraints (Table 25). The instrument containing the 14 retained items demonstrated acceptable reliability. A Cronbach's alpha ($\alpha = .865$) indicated a high level of internal consistency (Gliem & Gliem, 2003), and the deletion of no item would improve the Cronbach's alpha.

Table 24: Constraints Factor Loading Matrix

Item	Pattern coefficients			Structure coefficients			Communalities (extraction)
	1	2	3	1	2	3	
21. A lack of transport	.884	-.083	.012	.853	.195	-.293	.735
20. Transportation takes too much time	.826	-.067	.002	.803	.197	-.287	.649
18. Equipment is unaffordable	.770	.186	.143	.775	.381	-.217	.637
19. Participation is unaffordable	.694	.031	-.050	.723	.271	-.325	.527
15. Sub-standard university sport and recreation programmes	.591	.010	-.124	.641	.244	-.351	.424
16. Inadequate university facilities	.487	.016	-.116	.537	.214	-.307	.300
2. A lack of skills to participate	.055	.774	.058	.281	.770	-.244	.598
1. A lack of interest/motivation	-.123	.700	.009	.098	.657	-.199	.446
4. A lack of self-confidence	-.056	.794	-.251	.262	.767	-.482	.639
5. Participation is too fatiguing	.060	.669	-.103	.314	.726	-.369	.542
6. Health problems	.178	.438	.045	.301	.478	-.182	.255
9. Friends dislike participating	-.003	.001	-.853	.321	.310	-.782	.727
8. A lack of partners (friends or others) to participate with	-.006	.165	-.741	.328	.433	-.799	.662
10. Potential co-participants lack time	.139	-.044	-.741	.406	.270	-.778	.622

Note. Bold indicates that respective items loaded on the respective factors

Table 25: *Constraint Factor Correlation Matrix*

Factor	2	3
1	.320	-.379
2	1.000	-.363

Descriptive constraint statistics. The strongest constraints concerned a lack of: time due to study commitments, interest/motivation, self-confidence, partners, and knowledge of where to participate. Employed participants also reported a lack of time due to work commitments as a relatively strong constraint. The weakest constraints were cultural beliefs, the inconvenient location of university facilities, and the unaffordability of equipment and participation (Table 26).

Table 26: *Participation Constraint Strength*

	<i>M (SD)</i>
<i>Intrapersonal constraints</i>	3.05 (1.36)
A lack of interest/motivation	3.55 (2.00)
A lack of self-confidence	3.49 (1.89)
A lack of skills to participate	2.92 (1.67)
Participation is too fatiguing	2.67 (1.60)
Health problems	2.62 (1.91)
<i>Interpersonal constraints</i>	3.05 (1.62)
Lack of partners	3.34 (1.99)
Potential co-participants lack time	2.98 (1.84)
Friends disliking participation	2.82 (1.71)
<i>Structural constraints</i>	2.68 (1.28)
A lack of transport	2.70 (1.75)
Transportation takes too much time	2.72 (1.64)
Participation is unaffordable	2.65 (1.69)
Equipment is unaffordable	2.50 (1.61)
Sub-standard university sport and recreation programmes	2.69 (1.51)
Inadequate university facilities	2.84 (1.69)
<i>Other constraint items</i> ^a	
A lack of knowledge of where to participate	3.32 (1.81)
Lack of time due to study commitments	4.54 (1.74)
Lack of time due to social commitments	3.36 (1.76)
Lack of time due to work commitments ^b	4.52 (1.90)
Lack of time due to volunteer commitments ^b	2.96 (1.83)
Inconvenient university facility location	2.49 (1.55)
Cultural beliefs	1.32 (0.80)

^a Excluded from FA

^b Only presented to those who were employed/volunteered

Constraint variation based on participation. Analysis revealed constraint strength varied significantly based on participation level and type of physical activity. Overall constraint strength did not differ significantly between insufficiently active and active participants. However, compared to active participants, insufficiently active participants reported: significantly stronger intrapersonal constraints, significantly stronger responses to all intrapersonal items with the exception of 'health problems', and significantly weaker responses to the 'lack of transport' item (Table 27).

Table 27: Constraint Differences between Insufficiently Active and Active Participants

Constraints		Insufficiently active	Active	<i>p</i>	Effect size (η^2/r)
Intrapersonal	<i>M (SD)</i>	3.78 (1.34)	2.79 (1.28)	< .001	.103
	<i>Md</i>	3.90	2.60	< .001	.287
A lack of interest/motivation	<i>M (SD)</i>	4.91 (1.77)	3.06 (1.85)	< .001	.168
	<i>Md</i>	5.00	3.00	< .001	.405
A lack of self-confidence	<i>M (SD)</i>	4.28 (1.85)	3.20 (1.84)	.005	.064
	<i>Md</i>	4.00	3.00	.007	.245
A lack of skills	<i>M (SD)</i>	3.66 (1.93)	2.65 (1.49)	.010 ^a	.057
	<i>Md</i>	4.00	2.00	.011	.230
Participation is too fatiguing	<i>M (SD)</i>	3.38 (1.74)	2.42 (1.48)	.003	.071
	<i>Md</i>	3.00	2.00	< .001	.256
Lack of transport	<i>M (SD)</i>	2.19 (1.40)	2.89 (1.83)	.029 ^a	.040
	<i>Md</i>	2.00	3.00	.076	.161

^a Equal variances not assumed

Constraint strength also differed significantly based on type of physical activity. Intrapersonal constraints were significantly greater for non-university sport club members, non-external sport club members, non-representative sport participants, and non-university sport competition participants. Moreover, non-participants in each sporting activity rated multiple intrapersonal constraint items as significantly stronger. Structural constraints were significantly greater for non-university sport club members; and, non-representative sport participants reported significantly stronger time constraints. Also worth noting is that informal sports and university sport competitions were the only activities where non-participants did not report significantly stronger responses to the 'lack of interest/motivation' item. Finally, non-gym and fitness activity participants only reported significantly stronger responses to the 'lack of interest/motivation' (**Appendix G**, Table 32).

Demographic constraint differences. Analysis indicated significant differences in constraint strength based on gender, employment status, and disability status.

Gender. Compared to males, females reported significantly stronger overall constraints ($p = .026$, $\eta^2 = .041$), as well as significantly stronger intrapersonal constraints ($p = .002$, $\eta^2 = .082$, equal variances not assumed). Of the intrapersonal constraints, females reported significantly stronger constraints concerning: a lack of motivation/interest ($p = .027$, $\eta^2 = .041$), a lack of self-confidence ($p = .022$, $\eta^2 = .043$), participation being too fatiguing ($p = .018$, $\eta^2 = .047$, equal variances not assumed),

and health problems ($p = .003$, $\eta^2 = .071$, equal variances not assumed). Females also reported significantly stronger constraints concerning their friends disliking participation ($p = .034$, $\eta^2 = .037$, equal variances not assumed) (Table 28). Non-parametric analyses support the gender differences in constraints, with the exception of friends disliking participation where the gender differences were not statistically significant.

Table 28: *Constraints Gender Differences*

Constraints	Males <i>M (SD)</i>	Females <i>M (SD)</i>
Overall	2.68 (1.06)	3.11 (1.01)
<i>Intrapersonal</i>	2.66 (1.15)	3.44 (1.45)
A lack of interest/motivation	3.15 (1.90)	3.95 (2.04)
A lack of self-confidence	3.10 (1.77)	3.88 (1.95)
A lack of skills to participate	2.62 (1.53)	3.22 (1.77)
Participation is too fatiguing	2.33 (1.33)	3.02 (1.78)
Health problems	2.11 (1.53)	3.13 (2.13)
<i>Interpersonal</i>	2.79 (1.46)	3.31 (1.74)
Potential co-participants lack time	2.87 (1.81)	3.10 (1.87)
Lack of partners	3.00 (1.83)	3.68 (2.10)
Friends disliking participation	2.49 (1.47)	3.15 (1.89)
<i>Structural</i>	2.64 (1.31)	2.73 (1.25)
A lack of transport	2.59 (1.74)	2.82 (1.77)
Transportation takes too much time	2.61 (1.67)	2.83 (1.62)
Equipment is unaffordable	2.44 (1.65)	2.57 (1.59)
Participation is unaffordable	2.49 (1.62)	2.82 (1.76)
Sub-standard university sport and recreation programmes	2.75 (1.57)	2.63 (1.46)
Inadequate university facilities	2.97 (1.74)	2.72 (1.65)
<i>Other constraint items</i>^a		
A lack of knowledge of where to participate	3.08 (1.85)	3.57 (1.75)
Lack of time due to study commitments	4.31 (1.71)	4.77 (1.76)
Lack of time due to social commitments	3.33 (1.73)	3.40 (1.80)
Lack of time due to work commitments ^b	4.17 (2.06)	4.84 (1.72)
Lack of time due to volunteer commitments ^b	2.39 (1.46)	3.33 (1.98)
Inconvenient university facility location	2.25 (1.36)	2.73 (1.70)
Cultural beliefs	1.23 (0.84)	1.42 (0.74)

^a Excluded from FA

^b Only presented to those who were employed/volunteered

Employment status. Potential co-participants lack of time was a significantly stronger constraint for employed participants compared to unemployed participants (t -test: $p = .035$, $\eta^2 = .037$; Mann-Whitney U test: $U = 3997$, $z = -2.135$, $p = .033$, $r = .194$).

Disability status. Compared to those uninhibited by a disability, those inhibited by a disability reported significantly stronger responses on the 'health problems' item ($U = 6666$, $z = -1.956$, $p = .05$, $r = .178$). Parametric analyses did not reveal such corresponding significant differences.

Relationship between constraints and participation. Standardised residuals displayed in the scatterplot were slightly weighted towards the left, or disagreement end of the Likert-scale, as expected given the negative nature of constraints in conjunction with social desirability bias (Fisher, 1993). The model including the three constraint factors predicted 16.1% (adjusted $r^2 = .161$) of the variance in *participation* duration $F(3, 117) = 8.678, p < .001$. Only the intrapersonal and structural factors made significant contributions to the model (Table 29).

Table 29: *Unstandardised and Standardised Regression Coefficients for Constraint Factors in relation to Tertiary Participation Duration*

Factor	<i>B (SE)</i>	β	<i>t</i>	<i>p</i>
Intrapersonal	-1.595 (.361)	-.412	-4.420	< .001
Interpersonal	-.254 (.314)	-.078	-.808	.421
Structural	1.023 (.383)	.248	2.671	.010

4.7. Qualitative results

Participants were asked open-ended questions in relation to *participation* and the *psychological constructs* determined by the questionnaire (see **Appendix D**). Participants answered approximately 90% of the open-ended questions. Answers ranged from single words, to a paragraph of text. Though an inductive approach was adopted for analysis, the themes that emerged were reflective of the existing theoretical constructs. Three dominant themes emerged from the thematic analysis. These were time, interpersonal relationships, and changes in *participation* patterns. Each dominant theme is broken down into sub-themes. Less dominant themes to emerge related to motives, information, intrapersonal constraints, and transport constraints. It is important to acknowledge that these themes are inter-related and do not exist in isolation, but are reported separately in the following sections. Selected quotations from participants' comments that illustrate emergent themes are included.

Time. The most dominant theme to emerge from the analysis was related to time. Time-related sub-themes included time constraints, changes in priorities, and time management skills. Increased responsibilities, and the need to be self-sufficient, were lesser sub-themes to emerge, each of which can be linked with the other time-related sub-themes.

The most prominent reported constraints related to time, and included constraints such as a lack of time in general, as well as a combination of a lack of time due to study, social, and work commitments. For example, “time restrictions were greater due to studies and work” was a typical response offered as to how *participation* constraints had changed following the *transition*. A lack of time due to study commitments was the most commonly mentioned constraint.

A change in priorities following the *transition* was another time-related theme to emerge, with most prioritising their studies over *participation*. The following comment highlights such a change:

My first priority was to my degree and so studying was most important to me. This meant I had less time to spare for sports and physical activities particularly during the end of semesters when all the assignments became due... Also, time became more of a constraint, as I had to take my studies more seriously and spend more time on them than I had previously in secondary school.

Perhaps correlated with the prominence of time constraints, time management negotiation strategies were also among the most prevalent themes to emerge. Two females’ comments provide a good representation of those offered by others. The first commented: “time management had to be improved because I had more responsibilities, more of a social life and greater pressure from university work.” The second, a female physical education student, commented: “I had to adjust my time management and make sure I put university first. Keeping time to study and train, while keeping the balance of a social life.” The latter’s time management skills were likely what enabled her to maintain 30 hours of weekly *participation* whilst studying full-time. Interestingly, another two participants indicated that they participated in physical activities early in the morning prior to lectures.

Interpersonal relationships. The importance of interpersonal relationships is highlighted by the emergence of several inter-related themes. Some themes are positive in relation to participation, such as the positive influence of friends, importance of social motives, and use of interpersonal, i.e. relationship management, negotiation strategies; whereas interpersonal constraints emerged as a more negative theme in relation to participation.

The positive influence of friends on *participation* emerged as a dominant theme amongst female, but not male, participants. Two female university accommodation residents' comments encapsulate the essence of this theme. The first described how she had found a new circle of friends to participate with: "although I no longer had my family to participate in sport with, I had a circle of friends with interest in sport and physical activity." The second commented:

Signing up for competitions with friends/being in a team meant I was committed to showing up or else the team would be let down made me participate. And doing it with friends meant that going would be time to spend with them and catch up on our lives.

The importance of social motives was apparent for both genders.

Finally, relationship management emerged as a commonly adopted negotiation strategy. For example, a participant commented: "I got my best friend to come along so we could motivate each other to go."

In contrast to positive interpersonal relationship themes, participants frequently described interpersonal constraints, mainly those concerning a lack of partners due to not knowing anyone, or their peers' disinterest in *participation*. Several males, all university accommodation residents, referenced a lack of interest/motivation attributable to the negative influence of others. The following comment summarises their feelings: "less people getting involved, and more lazy people made it harder to just spontaneously get out and do something." Similarly, numerous female participants, once again predominantly university accommodation residents, described how peers had lessened motives or constrained *participation*. Examples of comments include: "my motivation ceased due to a lack of friends to participate with;" "I was no longer pushed to do sports; and at university I did not participate unless a friend pushed me to due to the need to seek out information unlike at secondary school;" and, "I went to a very sporty school there were lots of opportunities for sport as well as lots of people to participate with, but that at university, many of my friends did not want to participate in any sport." Finally, a female offered a response detailing how she was constrained by a lack of peers sharing a similar interest following the *transition*:

I had a really fit and competitive group of friends right through high school to go for runs with etc., but my new friends at university were not into fitness at all, and disliked anything too sweaty or intense e.g. running or competitive sport. It was difficult enough to convince them to go for walks, social sport etc. so I had to motivate myself and do exercise alone mainly.

Changes in participation patterns/preferences. A change in participants' participation patterns/preferences was the third dominant theme to emerge. This comprised two sub-themes: (1) a shift from participation in team/group sports to participation in individual physical activities, e.g. the gym and/or running; and, (2) a shift to less competitive and/or more social forms of sport.

The shift from participation in team/group sports to individual physical activities was expressed by participants of both genders, but predominantly by female participants, such as one who commented: "I participated in more independent physical activity such as running and going to the gym rather than playing team sports." In addition, "I worked out alone more," and "now I just exercise on my own as opposed to in groups/teams", were comments made by two female participants. Another female participant described both a shift to more individual physical activities and a reduction in competitiveness when offering the following comment: participation "decreased slightly and competing at a lower level to maintain a better social life and sufficient time for study. Changed from team based sports to more individual fitness at the gym."

Though several female participants made comments relating to a shift to less competitive and/or more social forms of sport, it was predominantly male participants, such as the one who offered the following statement, who described this change:

Throughout secondary school I participated in competitive sports, which required a lot of commitment. During university I found that taking part in competitive sports was very time consuming and didn't let you have time to socialise and study. Therefore I participated in social sports, which did not take as much of my time.

Analysis revealed that changes in participation patterns/patterns were also associated with constraints related to cost, i.e. a lack of money, and the affordability of certain activities. For example, some were constrained by the expense of activities, as demonstrated by the comment: "fees for hockey teams are too expensive."

Participants also described how their ability to participate had been impacted following the transition to personally paying for *participation* rather than having schools or parents meet costs. For example, a female participant described how she “put more thought into joining teams etc. because they are no longer funded by school or parents.”

Motives. Further, but less dominant, themes to emerge from the data related to how participants described a shift from what could be categorised as extrinsic motives such as competition, recognition, winning, and sporting prowess to more intrinsic motives such as enjoyment and fun. In relation to enjoyment and fun comments such as: “I became more concerned about having fun than winning” were common.

A number of participants also made comments concerning what could be classified as psychological motives. For example, participants described how they participated in order to “balance and de-stress from the work load,” “relax and take my mind off study instead of competitively like in secondary school,” and to “break or to get away from study rather than just doing it for enjoyment”. Finally, a number of participants mentioned what could be summarised as ‘personal development’ motives (intrinsic motive), which were not explicitly covered by any motive instrument items. For example, a male participant commented that participation: “was a lot less about competition and more about making myself better in all aspects.”

An increased focus on fitness and weight management also emerged, which was related to a shift in focus to individual physical activities. For example, a female offered the following representative quote: “I became slightly more motivated as I wanted to get fitter and lose weight meaning I went to [the] gym.” Furthermore, several referenced the desire to avoid gaining the “fresher five,” in reference to gaining five kilograms during one’s first year of tertiary study.

Information. Information was another theme to emerge, more specifically two sub-themes concerning a lack of, and acquisition of, pertinent information. A lack of, or difficulty acquiring, pertinent information about *participation* opportunities was a frequently mentioned constraint, in particular by those who had attended private or independent secondary schools, and is encapsulated by the following comment:

Information about sports is not as widely available... At school, it was easier to get involved as information was easier accessed e.g. newsletters and assemblies, so at university my participation levels pretty much dropped to zero as I had to go looking for the information... At university students have to seek out information regarding sports, so as I did not do this I did not participate unless a friend pushed me to.

Another emergent sub-theme was the proactive acquisition of information regarding opportunities to participate which, according to comments, was more readily available at secondary school: "I had to go out and find out about the sports for myself, rather than having the sports information being given to me."

Intrapersonal constraints. Intrapersonal constraints concerning interest/motivation, and physical and mental health emerged as prominent constraints, as did gender for a female participant.

Constraints revolving around a lack of interest/motivation were frequently mentioned. The following are examples of comments made by participants: "no sport caught or activity my attention;" "I lost interest so quit;" "I became lazy;" and, "I lacked the effort to participate."

Further themes to emerge related to how unique physical health conditions had constrained *participation*. For example, concussion issues forced a male to quit rugby, and circulatory problems and two incidences of broken bones constrained a female's participation. Several participants commented how tiredness or a lack of energy contributed to laziness and less motivation. In addition, a female commented that she was "often too hungover to go to the gym/run." What could be described as mental health constraints were also mentioned. For example, a male commented that: "stress of studies prevent enjoyment of participation." Moreover, a female commented that: "increased anxiety decreased willingness to participate."

In relation to gender, a female residing in university accommodation located just over a kilometre from the university recreation centre commented: "being female made it harder as I had time to work out at night but if I was by myself it wasn't safe to walk back in the dark."

Transport constraints. Transport related constraints were frequently mentioned by university accommodation residents, with the most detailed response provided by a male residing in university accommodation located off-campus who

mentioned the location of his residence as a constraint in response to multiple questions.

Instead of walking or getting driven to practices and campus, the distance of my hall of residence and the lack of a car meant bussing was my only dependable mode of transportation to university (45min commute)... My location of residence made it difficult to make commitments to regular sport practices and meetings.

Other university accommodation residents mentioned how they were constrained due to the “lack of personal transport,” and “no longer having their parents to drive them.” Moreover, a female living in university accommodation located approximately one kilometre away from the university recreation centre commented: “it always took ages to get to the gym,” despite also acknowledging that the trip was “only a 15min walk.”

4.8. Conclusion

In conclusion, results indicated that students' *participation* changed significantly following the *transition*, as indicated by the significant decrease in *participation*, and changes in *participation* patterns and preferences. Motives, negotiation strategies, and constraints were each shown to have a significant influence on *participation*. *Participation* and various motives, negotiation strategies, and constraints differed significantly based on various socio-demographic variables. Motives, negotiation strategies, and constraints also differed significantly based on *participation* levels and physical activity type.

Chapter 5: Discussion

This chapter begins with a discussion regarding the changes in *participation* following the *transition*; more specifically the decrease in *participation*, the associated increase in insufficient physical activity, and the changes in *participation* patterns and preferences. The relationships between *participation* and socio-demographic variables are then discussed. Next the findings concerning the *psychological constructs* (motives, negotiation strategies, and constraints) are examined, followed by a consideration of the findings on the relationship(s) between *participation* and *psychological constructs*. A comparison and contrast of *psychological construct* findings with those reported in the literature follows. The implications of the qualitative findings are integrated throughout this chapter. The chapter concludes with the limitations of this study, theoretical and practical implications of the findings, and suggestions for future research in this area.

5.1. Changes in Participation

Results revealed a number of changes in students' *participation*. These changes included a decrease in *participation*, an increase in the prevalence of insufficient physical activity, and changes in students' *participation* preferences and patterns.

Decrease in participation. A key aim of this study was to establish whether students' *participation* decreased following the *transition*. In line with previous research, *participation* decreased significantly following the *transition* (Table 4). The decrease in *participation* duration is similar to that reported by Sinclair et al. (2005) in NZ students. However, given cross-sectional studies have consistently reported lower decreases compared to longitudinal studies, the decrease indicated this study's findings very likely to be greater in reality.

Increase in insufficient physical activity. Not only was there a decrease in *participation*, but the prevalence of 'insufficiently active' students increased significantly following the *transition*, rising from 15.7% at secondary school to 26.4% at university. This is considerably less than the 60% insufficiently active reported by Sinclair et al. (2005) amongst NZ students, as well as the 27% of students who reported being physically inactive in Roger's (2016) study. The prevalence of insufficient physical activity is also slightly on the lower side compared to the 30-50% reported in the

majority of the international literature (Keating et al., 2005). However, this study, along with the existing literature, is limited by the use of self-reported measures that have been shown to result in over-reporting in young adult populations (Sirard et al., 2013; Slootmaker et al., 2009). Moreover, studies that focus on sport and physical activity are exposed to respondent tendency bias, especially in a country such as NZ that has such a strong perceived sporting culture. In addition, this study's participants appeared to be more active as a group at secondary school compared to the national average (Walker & Huaghey, 2012). Finally, like previous studies, this study did not assess participants' resistance or flexibility training frequency, which most national health organisations include as a part of their physical activity guidelines. Due to constraints of a Masters study, these findings should be treated with caution, but nevertheless, these findings offer further support that there is a decrease in physical activity following the *transition*. Further, that only approximately one in four students were found to be insufficiently active is particularly concerning as in the wider student population the prevalence of insufficient physical activity is likely far higher.

Changes in participation patterns and preferences. In addition to the change in students' *participation* levels, both qualitative and quantitative data revealed changes in students' *participation* patterns and preferences following the *transition* (Table 4).

Informal sport participation levels remained stable, in contrast to the findings of Rogers (2016) who reported that 36% of students at a large North Island NZ tertiary institution had decreased their participation in informal sport and recreation activities following the *transition*. Compared to the North Island institution, this current study's institution has inferior indoor spaces and superior outdoor spaces. The greater opportunities to participate in sports and recreational activities outdoors may have contributed to the maintenance of similar levels of informal sport participation following the *transition*.

A statistically significant decrease in participation in external club and representative competitive sporting activities was also observed for both genders (Table 6). The decrease in representative sport participation may be attributable to the transition to more open age-group representative sport where competition for places increases. The decrease in external club membership may be attributable to a shift to a university club. However, university sport club participation was also relatively low,

even less so than external sport club participation, which is consistent with the findings of Rogers (2016).

The qualitative results perhaps offer an insight into the reasons for this decrease. A shift from participation in team/group sports to participation in individual physical activities, e.g. the gym and/or running; and, a shift to less competitive and/or more social forms of sport emerged as themes from qualitative data analysis. These themes closely resemble the shift in participation patterns of NZ adults, where according to Sport NZ (2015a) the demand for team and organised sport is declining, as is sport club membership, whereas the demand for individualised sport and physical activity is on the rise, as are gym memberships.

In addition to supporting the decrease in participation in competitive sporting activities, these themes also support the stability of informal sport participation, the uptake in university sport competition participation, and the increase in gym and fitness activity participation. These changes in *participation* patterns are supported by Bloemhoff and Coetzee's (2007) findings, who attribute the change to the ease with which informal activities, especially outdoor activities, can be organised.

There are numerous possible explanations for the changes in *participation* preferences and patterns, and qualitative data provides some insight into how constraints and motives influence these changes. As far as constraints, affordability played a role in the increase in gym and fitness activity participation as participants mentioned how the free student recreation centre membership encouraged their participation, and to a lesser extent participation in the free university sport competitions. Other constraints may have also influenced changes in *participation*. For example, though not mentioned by participants explicitly, individual physical activities may be easier to participate in compared to group activities from a time perspective since they do not require coordination of time with friends, or the commitment to a team.

Participants described a shift from what could be categorised as extrinsic motives such as competition, recognition, winning, and sporting prowess to more intrinsic motives such as enjoyment and fun. This mirrors the shift in *participation* preferences towards less competitive and more social forms of physical activity. The shift away from extrinsic motives may be associated with reduction of external

influences, i.e. schools, parents, and long-term peers, etc. following the *transition* (Deliens, Deforche, De Bourdeaudhuij, & Clarys, 2015). Also, participants described an increased focus on fitness and weight management, with several referencing the desire to avoid gaining the “fresher five,” in reference to gaining five kilograms during one’s first year of tertiary study which is similar to the “freshman 15” (pounds) amongst American students (Jung et al., 2008; Nelson et al., 2009).

Asides from motives and constraints, some of the changes in *participation* patterns appear to be influenced by gender. Firstly, in contrast to males, the increase in female participation in gym and fitness activities approached statistical significance, with more than half of secondary school non-gym and fitness activity participants initiating participation following the *transition*, and less than a quarter ceasing participation following the *transition*. This is in line with findings that indicate NZ adult females have a preference for such activities (Sport NZ, 2015b). Secondly, of the tertiary types of physical activity, secondary school sport participation only had a significant correlation with university sport competition participation. However, further analyses revealed that this correlation was only significant for males, but not females. This raises concerns about the pathway for females to continue to play sport at a relatively social level following the *transition*.

5.2. Relationship between Participation and Socio-demographic Variables

In addition to examining the relationship between *participation* and the *psychological constructs*, another aim of this study was to examine the relationship between *participation* and various socio-demographic variables. Statistically significant differences were revealed based on gender and living situation (Table 7).

In the case of gender, the only significant differences were that more males were external sport club members and males participated in more representative sport than females. Otherwise *participation* duration and frequency, as well as participation in informal sport, university sport clubs, gym and fitness activities, and university sport competitions were similar between genders. This is encouraging, as it is in contrast to the findings of the existing literature where female students have consistently been reported as less active compared to male students in terms of overall levels of physical activity (for example see Fountaine et al., 2011; Mohammed

et al., 2014; Pacheco et al., 2014). As alluded to above, gender also appeared to influence the uptake of gym and fitness activities and the lack of translation from secondary school sport to participation into tertiary sport participation.

In relation to living situation, university accommodation residents were significantly more likely to have participated in university sport competitions. This supports the previous findings that on-campus residents were significantly more likely to use CRFs (Henchy, 2011; K. Miller et al., 2008; Milton & Patton, 2011; S. Smith, 2011; Zizzi et al., 2004). The difference is possibly attributable to the ready-made social networks university accommodation offers, the assistance and encouragement university accommodation residents receive to participate in university sport competitions, and as well as proximity to facilities.

Aside from gender and living situation, analyses were also conducted on employment status, volunteering, status, disability status, and first in family status. As expected differences emerged, but these are likely attributable to the small sample size, which prevented the analysis of *participation* by ethnicity, differences did not reach statistical significance.

5.3. Examining Constructs

Before discussing the findings relating to motives, negotiation strategies, and constraints in relation to *participation* and other variables it is pertinent to compare and contrast the findings of this study with the existing theories regarding each construct. The final section of this chapter discusses ways in which further clarity and insight could be gained into each construct.

Motives. Collectively the quantitative and qualitative components of this study lend support to SDT. According to Deci and Ryan (2000) SDT proposes “that an understanding of human motivation requires a consideration of innate psychological needs for competence, autonomy, and relatedness”(p. 227). The psychological needs reflect the needs to perceive the following: competence - that one’s behaviour and interaction with the social environment as successful; autonomy - that one’s behaviours and thoughts as freely selected and one is the source of one’s actions; and, relatedness - that one is connected to those around oneself and belongs (Weiss & Amorose, 2008). Moreover, SDT also assumes that motivation occurs on a continuum

from intrinsic to extrinsic motivation (Lauderdale et al., 2015).

In the case of this study, the needs for competence and relatedness are represented by the competence-mastery and interpersonal factors respectively, but the need for autonomy is not represented by a motive factor. However, the changes in *participation* patterns exhibited by many students, as well as the overall decrease in *participation* following the *transition*, are potentially indicative of the increased autonomy tertiary students may have over their decisions due to the absence of the influence others, particularly parents, that had previously influenced their secondary school *participation*. Moreover, some of the changes in *participation* patterns and the associated motives are also reflective of the other needs. For example, the shift to less competitive/more social sports, which are associated with a greater likelihood of success (competence) and an opportunity connect with those around oneself and gain a sense of belonging (relatedness). Finally, similar to what Markland and Ingledew (1997) found when developing the EMI-2, this study's motive factors cannot be easily classified as intrinsic or extrinsic. Thus, as suggested by SDT Lauderdale et al. (2015), rather than fitting motives into a dichotomous classification, it could perhaps be more helpful to conceptualise motives as sitting on an intrinsic-to-extrinsic continuum.

Negotiation. Despite the lack of previous FA, i.e. validation, of negotiation instruments (see chapter two) the extracted negotiation factors approximate those proposed in the literature. However, the results of this study suggest that the existence of a higher-order construct of negotiation is doubtful given the interpersonal strategies factor was negatively correlated with the others, which were positively correlated with one another. Another finding of theoretical importance is that qualitative data support the findings of Jackson and Rucks (1995), in that though most constraints appear to be negotiated using a corresponding strategy, some constraints are negotiated tangentially rather than directly. This suggests negotiation strategies cannot be predicted based on the type of constraints. For example, a participant described how he overcame time constraints associated with competitive sport by participating in more social sport instead. Descriptions such as this resulted in the emergence of two themes relating to changes *participation* patterns, which may in fact represent negotiation strategy factor. The presence of such a factor is supported by the existence of what researchers have referred to as 'changing leisure aspiration'

strategies (A. C. Shaw, Flack, Smale, & Gold, 2012; White, 2008). The emergence of such a theme in this study also supports Jackson's (2000) proposition that life transitions provide new opportunities for constraint negotiation.

Constraints. The three constraint factors (intrapersonal, interpersonal, and structural) extracted following FA closely resemble those of CT (Crawford & Godbey, 1987; Crawford et al., 1991). The major departure from CT is that time constraints did not appear to share common variance with the other items, as indicated by low communalities. Low communalities can indicate that an additional factor, such as time, should be explored. Moreover, even when time constraints were retained they loaded on the interpersonal rather than the structural factor. Had more time related items been included some may have been retained and represented a factor in their own right.

It is clear from chapter two that the 3-factor model, such as the one produced by this study, does not provide the best representation of constraints from a theoretical sense. The reason more factors were not extracted from this study's data is largely attributable to the smaller condensed instrument. It was also clear from chapter two that further research is required to determine whether multiple-factor or second-order factor models provide the best fit to the data. However, the results of this study would appear to support a multiple-factor model, which provides a more detailed specification, rather than a second-order model, which may oversimplify constraints and not be theoretically sound.

Some constraints are clearly intrapersonal, interpersonal, or structural. However, evidence suggests that time constraints may not be structural as is proposed by CT (Crawford & Godbey, 1987). In fact, Chan Sun and Azmutally (2013) classified time as an intrapersonal, rather than structural, constraint. Time constraints are clearly important in the context of physical activity as with the exception of a small number of studies, a lack of time has consistently emerged as the most important constraint to students' physical activity in various contexts regardless of the underpinning theory, and in the absence of any theory at all.

Crawford and Godbey (1987) conceptualised structural constraints as factors that exist within the environment and intervene between leisure preferences and participation. However, is time something that exists within the environment that

intervenes between leisure preferences and participation? The answer depends on one's view of time, and the varying viewpoints of philosophers only highlight the complexity of the concept of time. Disregarding whether time is sensed or judged, one could argue that what one spends their time on is dependent on a combination of themselves, others, and their environment. Thus, time constraints may be intrapersonal, interpersonal, and/or structural in nature. As such, it would be remiss to classify time constraints as structural, let alone any particular type of constraints. If anything, time constraints are interpersonal, as one is ultimately responsible for how they spend their time and interact with others and their environment.

The notion that time constraints are generally intrapersonal are supported by the findings of Mercatante (2009), who found that poor time management, rather than a lack of time, constrains students sport participation. Assuming Mercatante is correct, and that poor time management results in the perceived, or real, lack of time, time constraints then lie primarily within the individual, i.e. intrapersonally, but are also influenced by interpersonal and structural factors. This finding is important for another reason, because for most the *transition* will disrupt routines that they were accustomed to having as secondary school students (Bray & Born, 2004), thus decreasing students' effectiveness at managing time, and therefore likely altering their perception of time constraints.

An additional wrinkle concerning time and constraints is that like all perceptions, perceptions of constraints can change over time. In fact, those who originally proposed CT suggested that the hierarchical model of constraints should be interpreted as circular and dependent on one's stage in life (Godbey et al., 2010). In other words the importance of constraints will change throughout one's life. However, Godbey et al.'s proposition takes a macro-level perspective of the relationship between constraints in time, where in fact one's perception of constraints is likely to vary at a micro-level from day-to-day, and even second-to-second.

Another departure from the literature is that the 'lack of knowledge of where to participate' item was excluded from the extracted factors due to an inadequate factor loading. A number of potential explanations exist as to why this occurred. Firstly, looking at the student-focused literature there is considerable variation in the approach taken by researchers to assess such constraints. Some assess constraints

associated with a lack of information (Alfadhil, 1996; Masmanidis et al., 2009; Masmanidis et al., 2015), others in relation to a lack of knowledge (Chung et al., 2013; Liu et al., 2013), and (Ehsani, 2005) in relation to awareness. Moreover, some consider constraints such as intrapersonal (Chung et al.), and others as structural (Alfadhil; Masmanidis et al.; Masmanidis et al.). Perhaps the difference is that knowledge, is perceived as more intrapersonal, and information is perceived as more external or structural.

5.4. Relationship(s) between Participation and Psychological Constructs

One of the aims of this study was to assess the relationships between *participation* and factors that influence *participation*. The relationships between these variables have been a point of contention between researchers. In the case of the relationship between constraints and *participation*, the absence of a relationship between constraints and negotiation supports the 'dual channel model', where constraints and negotiation have opposing yet independent effects physical activity (Son, Kerstetter, et al., 2008; Son, Mowen, et al., 2008). However, the exclusion of important constraints, such as time constraints, may have influenced the findings.

As far as the relationship between motives and *participation*, findings support previous findings that the relationship of motives with physical activity is mediated, likely fully, by negotiation, as indicated by the partial correlation analysis between motives and *participation* controlling for negotiation. That negotiation mediates the relationship between motives and *participation* is important because it suggests that, in the absence of the skills or resources to negotiate constraints consistently, *participation* may not result even in the presence of sufficient motives. Moreover, it also suggests that if an individual's motives change or decrease *participation* may decrease or even cease. The apparent relationship between psychological constructs and *participation* is depicted in Figure 1.

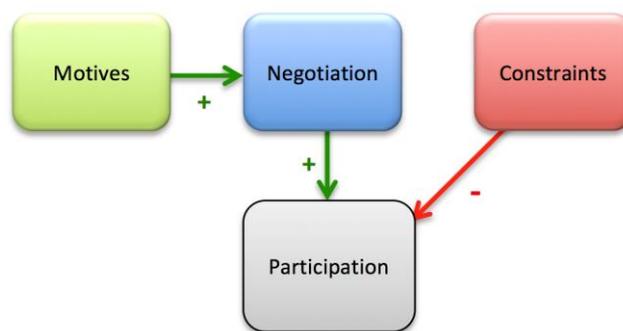


Figure 1. Relationship between Motives, Negotiation, Constraints, and Participation

In this study the relationship between constraints and negotiation was very weak (Table 11). Statistically this suggests that constraints and negotiation are unrelated, contrary to the findings of various researchers. However, this weak relationship potentially indicates that there is both a positive and negative relationship between constraints and negotiation, as proposed by Jackson et al. (1993), whereby constraints trigger negotiation, and negotiation reduces constraints. The alternative model based upon this proposition is depicted in Figure 2.

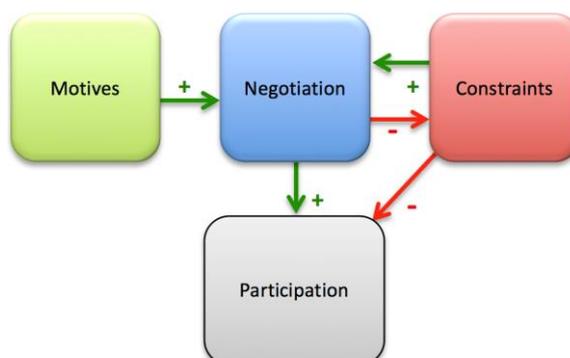


Figure 2. Alternative Model of the Relationship between Motives, Negotiation, Constraints, and Participation

A discussion of the differences in motives, negotiation, and constraints between active and insufficiently active participants, and participants and non-participants in different activities follows.

Motives and participation. Motives were revealed to differ significantly between active and insufficiently active participants. In the case of differences in students' sport motives based on sport participation levels, such differences have yet

to be examined in the literature. As far as differences in students' exercise motives based on exercise levels, which have previously been examined in the literature, the findings of this study are largely unsupported by previous findings that are relatively inconsistent (Downes, 2015; Junior et al., 2015; Ledford, 2013; McArthur & Raedeke, 2009). Like previous studies, differences between active and insufficiently active participants are inconsistent (Table 15). That being said, that enjoyment is a significantly stronger motive for active participants potentially implies that those less active either do not enjoy physical activity, or have not found an enjoyable physical activity that they can participate in. For example, one participant commented, "I lost a lot of motivation to do sport in my final year of secondary school as I wasn't really enjoying it as much as I used to, and that continued into my first year of [university]."

In addition to *participation* levels, motives were also found to vary between participants and non-participants in different physical activity types. Collectively, findings suggest that there is a difference in the motivational profile of participants in different activities. The following findings resulting from quantitative analyses are supported by qualitative data that also indicated motives may have an influence on the types of activities students participate in.

In line with previous research, a clear difference emerged between sport and exercise motives. Gym and fitness activity participants (unlike sporting activity participants) reported significantly stronger body/health related and fitness (strength and endurance, and speed agility and flexibility) motives compared to non-participants. This is in support of previous findings where appearance and weight-management, and fitness motives have been shown to have a greater association with exercise compared to sport (Cagas et al., 2015; Kilpatrick et al., 2005). Gym and fitness activity participants also reported significantly stronger stress management motives compared to non-participants, a difference not reported in previous literature or shown between participants and non-participants in any of the sporting activities in this study (**Appendix G**, Table 30).

New findings also emerged in relation to sporting activity motives, which have previously gone unexamined. Interpersonal motives had a stronger association with less competitive sporting activities (informal sport, and university sport competitions) compared to more competitive sporting activities (university sport clubs, external

sport clubs, and representative sport) and a weak association with gym and fitness activity participation. This potentially implies that less competitive sporting activities offer better opportunities to interact with others compared to more competitive sporting activities and gym and fitness activities. Interestingly, social recognition motives appeared to be of greater importance to participants in university associated sporting activities, that is, for university sport competition participants and university sport club members. In the case of university sport competitions, this difference appears to be attributable to the desire to gain recognition for one's personal accomplishments, potentially stemming from the opportunity to display competence in front of one's peers. In the case of university sport clubs the difference was mostly attributable to the desire to gain others' respect, perhaps suggesting that members believe playing for university club may earn them a certain level of respect. Finally, as expected, competition was found to be a particularly important motive for more competitive sporting activity participants. What is even more interesting is that, based on effect sizes, competition was more important for external sport club members compared to university sport club members, and extremely important to representative sportspeople (**Appendix G**, Table 30).

Negotiation and participation. Aside from negotiation being shown to mediate the relationship between motives and *participation*, further findings reaffirmed the importance of one's ability to negotiate constraints to subsequent *participation*. Negotiation's importance to *participation* is reinforced by the differences between active and insufficiently active participants; where active participants reported significantly greater negotiation overall, as well as significantly greater responses on nearly all negotiation items (Table 21).

In addition to varying significantly based on *participation* levels, negotiation also differed significantly between participants and non-participants in different types of physical activity (**Appendix G**, Table 31). These findings offer an insight into the constraints encountered by participants in each activity, and which strategies appear to be determinants of participation in particular activities. With the exception of representative sport, participants in each physical activity reported using interpersonal strategies significantly more frequently (**Appendix G**, Table 31). This demonstrates that, to a certain extent, many individuals are dependent on the cooperation of others

to participate. One point worth noting is the large difference in interpersonal strategies between participants and non-participants in university sport competitions. Especially because it may explain why non-university accommodation residents were significantly less likely to participate in university sport competitions compared to residents, perhaps due to the absence of others to facilitate the negotiation of constraints, in particular the formation of a team.

Thematic analysis revealed support for the importance of one's interpersonal relations to *participation*, as the positive influence of friends and the use of interpersonal negotiation strategies emerged as themes. For example, a participant commented: "I got my best friend to come along so we could motivate each other to go." The lesser importance of interpersonal strategies to representative sport participants may reflect a decreasing importance of interpersonal strategies with increasing performance levels. Finally, it is interesting that despite interpersonal motives, i.e. interacting with others etc., being not important for gym and fitness activity participants, negotiation findings suggest others played a key role in gym and fitness activity participants' participation as indicated by the significance of interpersonal negotiation strategies.

As would be expected, participants in more competitive sporting activities reported using time prioritisation and financial management strategies significantly more frequently than non-participants (**Appendix G**, Table 31). Qualitative analysis revealed the increased importance of time management to *participation*, and juggling study and social commitments with *participation*. As exemplified by the following comment offered by a female participant who maintained 30 hours of weekly *participation* whilst studying full-time: "I had to adjust my time management and make sure I put university first. Keeping time to study and train, while keeping the balance of a social life." In the case of financial management, there an increased focus on the affordability of activities due to costs no longer being covered by schools and/or parents emerged from qualitative data. For example one female participant described how she "put more thought into joining teams etc. because they are no longer funded by school or parents."

Differences in a number of negotiation strategy items also offer interesting insights into the importance of negotiation of *participation* constraints in relation to

particular activity types. The first is that representative sport participants and external sport club members reported significantly higher responses on the 'transport arrangement' item. This is not surprising, given these activities are likely to take place off-campus. Next, non-representative sport participants and university sport competition participants reported significantly higher responses on the 'participated in less competitive activities' item. This potentially suggests a conscious decision to participate in either less competitive activities and/or activities that are not dependent on others, and, in the case of non-representative sport participants, to stop playing high-level sport. Finally, information acquisition and skill acquisition negotiation items differed significantly between participants and non-participants in several activities. Skill acquisition was significantly greater for participants in informal sports, university sport clubs, and external sport clubs. This potentially suggests that rather than a perceived lack of skills constraining *participation*, apprehension of a lack of confidence to acquire skills may represent a constraint itself. Information acquisition was a negotiation strategy used significantly more frequently by participants in all activities except for informal sport and university sport competitions. This finding could be interpreted in a number of ways. It may suggest that information acquisition is not particularly important to participation in informal sports or university sport competitions, which is likely the case for informal sport. Alternatively, it potentially suggests that information on university sport competitions did not need to be acquired because it was already at the disposal of students. Moreover, it potentially indicates that information acquisition is a determinant of participation in competitive sporting activities and gym and fitness activities, or that information on such activities is not readily presented to students. The latter interpretation is contradictory to the finding that the 'lack of information of where to participate' item was not a significant constraint to all such participation. However, this may be due to poor wording of the item, as there is more information important to participation other than 'where' to participate (**Appendix G**, Table 31).

Constraints and participation. Though overall constraints contributed significantly to the prediction of *participation* duration, further analysis suggests that intrapersonal constraints, above all others, have the greatest influence on *participation* (Table 29). The importance of intrapersonal constraints is further

highlighted by insufficiently active participants reporting significantly stronger intrapersonal constraints, with significantly stronger responses to all intrapersonal items except 'health problems' (Table 27). This is in support of previous studies which have reported constraints, in particular intrapersonal constraints as significantly greater in those who are active compared to those who are inactive (Cowie & Hamilton, 2014; Downes, 2015; Grubbs & Carter, 2002; Ledford, 2013; Liu et al., 2013; Masmanidis et al., 2009; Mirsafian, 2014; Montasser et al., 2011). However, unlike previous studies time constraints were not significantly greater for less active participants compared to more active participants (Cowie & Hamilton; Grubbs & Carter; Ledford). Aside from intrapersonal constraints, active participants reported significantly stronger responses to the 'lack of transport' item compared to insufficiently active participants. A lack of transport, a structural constraint, would be expected to be more salient to active participants, compared to insufficiently active participants who likely are yet to have negotiated intrapersonal constraints (Table 27).

In addition to difference in constraints based on *participation* levels, this study offers new insight into differences in constraints based on the type of physical activity. Prior to this study, only one study has previously examined the differences in students' constraints based on the type of physical activity (Spivey & Hritz, 2013). The findings of this study are inconsistent with the findings of Spivey and Hritz, mainly due to the differences in the instruments used and the categorisation of different types of physical activities.

In line with differences based on *participation* levels, intrapersonal constraints were also significantly greater for non-participants in each sporting activity, but not for non-participants in gym and fitness activities who only reported significantly stronger responses to the 'lack of interest/motivation' item. The latter finding is interesting, as it indicates that enticing or motivating non-participants in gym and fitness activities may initiate their participation. This requires an understanding of the motives of non-participants in gym and fitness activities, motives, which appear to be more social in nature, suggesting that marketing or designing more social gym and fitness activities may increase the physical activity of some non-participants those activities. By way of example, the promotion boot camp style activities available to students may pique the interest of non-participants and satisfy their social motives. Also worth noting is that

informal sports and university sport competitions were the only activities where non-participants did not report significantly stronger responses to the 'lack of interest/motivation' item. Thus, it would appear that non-participants in less competitive sporting activities are interested in participating in such activities, but are instead constrained by other factors (**Appendix G**, Table 32).

An insight into why intrapersonal constraints are so important is offered by theorists who made the three following propositions. First, individuals must negotiate constraints sequentially from the most proximal (intrapersonal) to the most distal (structural) in order to participate (Crawford & Godbey, 1987). As such intrapersonal constraints typically have to be negotiated prior to participation, or even the formation of preferences. Second, anticipation of an interpersonal and/or structural constraint may effectively function as an intrapersonal (antecedent) constraint, and suppress the desire to participate potentially offers an insight into why intrapersonal constraints are so important (Jackson et al., 1993). Finally, antecedent constraints may also influence negotiation efforts, as a lack of desire (interest) in negotiating constraints may stem from genuine disinterest, satisfaction with present participation, or the effects of antecedent constraints (Witt & Goodale, 1981). These proposed relationships are depicted in Figure 3.

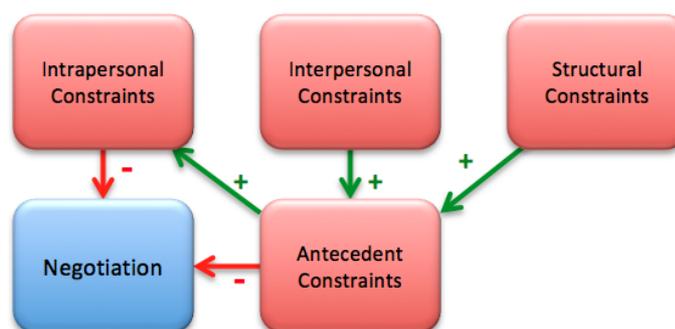


Figure 3. Antecedent Constraints and their Relationship with Intrapersonal Constraints and Negotiation

These propositions suggest that intrapersonal constraints are more likely to be experienced by those with low *participation* levels, whereas those with higher *participation* levels are more likely to experience structural constraints as a result of

having already successfully negotiated intrapersonal, and likely interpersonal, constraints. Moreover, intrapersonal constraints will be enhanced by the anticipation of antecedent interpersonal and/or structural constraints, which may subsequently decrease motives and/or negotiation efforts. This may also explain why interpersonal constraints had minimal influence on *participation*, and structural constraints appeared to have a positive relationship with *participation*.

Finally, non-university sport club members reported significantly greater constraints associated with the university facilities and services. Non-university sport club members also reported significantly stronger responses to the 'lack of knowledge of where to participate' item. Given these differences were not significant in relation to any other activity, they indicate that sub-standard/inadequate facilities and services as well as a lack of information on sport clubs may have influenced students' decisions as to whether or not to join a club (**Appendix G**, Table 32).

5.5. Motives

Though motives may not directly influence *participation*, results offer an interesting insight into what may motivate students, and sub-populations of students, to begin to negotiate constraints. Results are relatively consistent with the literature where enjoyment was an important sport motive (Ciuffo et al., 2014; Houselog, 2014; Mirsafian et al., 2013), and health, strength and endurance/fitness, appearance, weight management motives were rated as important exercise motives (Kilpatrick et al., 2005; Kulavic et al., 2013; Ledford, 2013; Pauline, 2013). The main departure from the literature was that 'prevention or recovery from illness/injury' appeared to be a relatively unimportant motive, whereas exercise motive studies reported ill-health avoidance among the most important motives (Table 14).

Quantitative results are supported by themes that emerged from qualitative data which, in a complementary fashion, enable a greater understanding (Yauch & Steudel, 2003). Firstly, qualitative results indicated a shift from extrinsic to intrinsic motives, supporting the relative unimportance of social-recognition motives, which most would classify as extrinsic motives. The importance of body/health related motives was also reinforced the by participants describing the increased importance of such motives following the *transition*.

The only statistically significant difference in motive strength based on socio-demographic variables was by gender. Overall motive strength was similar for both genders. However, females reported significantly stronger body/health related motives, largely due to significantly stronger responses in relation to the 'weight management' and 'balanced/healthy lifestyle attainment' items. The importance of body/health related motives to females are consistent with the student exercise motives literature (Chan Sun & Azmutally, 2013; Egli et al., 2011; Guedes et al., 2013; Hall et al., 2002; Junior et al., 2015; Li et al., 2015; Meyer & Bevan-Dye, 2014; Pauline, 2013; Pope & Harvey, 2015; Roberts et al., 2015). Females also reported significantly stronger responses to the 'stress management' item, like Pauline (2013) in relation to exercise motives, and other studies in relation to sport motives (Beggs et al., 2004; Kanters & Forester, 1997). The finding that enjoyment is significantly greater for males is supported by a few studies in which the EMI-2 was used to assess exercise motives (Egli et al.; Meyer & Bevan-Dye; Roberts et al.). Competition, social, and fitness motives tended to be reported as significantly greater for males in the student exercise motives in the literature unlike this study. Gender differences in the sport motives literature are relatively inconsistent by comparison. Though previous findings that social motives were significantly greater for females in relation to sport were also not supported (Beggs et al., 2004; Mirsafian et al., 2013) (Table 16).

5.6. Negotiation

Interpersonal negotiation strategies, as well as well-being strategies emerged as being frequently employed by students. A number of reasons likely attributed to the emergence of interpersonal strategies as relatively important. Students are likely to encounter social changes following the *transition* (Bray & Born, 2004), such as moving away from existing social networks, requiring students to more frequently encourage friends and others to participate. University sport competitions at this institution are largely mixed, and require one female player per side. This may explain the why participating with the opposite gender was a commonly employed strategy. The importance of well-being management strategies is also potentially attributable to a number of reasons, mainly due to the newfound independence that students

described, which is accompanied by increased responsibility for one's well-being making such strategies more salient to individuals.

In support of the emergence of the shift to less competitive and/or more social activities theme from qualitative analysis, there was a relatively strong response to the 'participation in less competitive activities' item excluded from FA. Also, responses to the 'skill acquisition' and 'information acquisition' items, which were both excluded from FA, were also relatively high (Table 20). The prevalence of the employment of skill acquisition strategies may be due to the changes in *participation* preferences that require students to learn new skills. Whereas the importance of information acquisition is likely due to students having to acquire information that in the past had been provided by secondary schools.

In contrast, time prioritisation and financial management strategies were employed relatively infrequently. Limited literature exists on students' *participation* constraints negotiation, and the findings have been relatively inconsistent. The findings of this study closely resemble those of two American studies which reported interpersonal relations as the most frequently employed strategies, followed by skill acquisition, and physical fitness strategies. Time management was the fourth most frequently employed strategy, followed by financial management and intrapersonal validation strategies (Beggs et al., 2005; Elkins et al., 2007). As such, they also contradict the findings of two Canadian studies in which time-management strategies were the most frequently employed, followed by skill acquisition and interpersonal strategies (Wood, 2011; Wood & Danylchuk, 2015). Findings may differ because the American studies involved students in general, whereas the Canadian studies involved students already engaged in intramural sports. Thus, the difference might be attributable to certain negotiation strategies being employed more frequently by active participants compared to students in general. Prior to this study variations in negotiation strategy factors or items based on participation levels or physical activity types had yet to be examined. This study offers such insight.

Variances in negotiation strategies based on socio-demographic variables have largely gone unexamined, with only Beggs et al. (2005) reporting variations based on gender, but not living situation or year of study. Unlike Beggs et al., no significant gender differences were found. Moreover, unlike Beggs et al., statistically significant

differences were found based on living situation. Compared to those in other living situations, university accommodation participated significantly more frequently with the opposite gender, and in less competitive activities. These differences are potentially associated with the greater participation rates of university accommodation residents in university sport competitions which are all mixed gender competitions and relatively uncompetitive. Both parametric and non-parametric analyses showed that, compared to those uninhibited by a disability, those inhibited by a disability reportedly significantly more frequently using strategies such as: improving physical fitness, improving eating habits, and coordinating participation with friends. The relative importance of physical fitness and eating habits to those inhibited by a physical disability may indicate their focus on rehabilitation or injury avoidance. The greater frequency of coordinating participation with friends may indicate a reliance on friends to participate.

5.7. Constraints

Results both supported and contradicted those reported previously in the literature. Constraints associated with facilities and services were relatively unimportant, in contrast to previous findings (Hashim, 2012; Henchy, 2011; LaCaille et al., 2011; Masmanidis et al., 2009; Masmanidis et al., 2015; Qianyu & Ross, 2014; Spivey & Hritz, 2013), and were mentioned infrequently in qualitative responses suggesting that students are relatively satisfied with the available facilities. However, like nearly all studies concerning students' constraints, time constraints were the greatest, and a lack of knowledge and a lack of partners were also important constraints (Masmanidis et al.; Masmanidis et al.; S. B. Smith, 2007; Spivey & Hritz; Young et al., 2003). Quantitative results are supported by themes that emerged from qualitative analysis. Time emerged as the most commonly mentioned constraint. A lack of, or difficulty acquiring, pertinent information about *participation* opportunities was also frequently mentioned, in particular by those who had attended non-public secondary schools. Participants frequently described interpersonal constraints, mainly those concerning a lack of partners due to not knowing anyone, or their peers' disinterest in participation. A lack of interest/motivation emerged from both quantitative and qualitative results as an important constraint in this study, despite

being one of the less important constraints in most other studies (Gyurcsik et al., 2004; Gyurcsik et al., 2006; Montasser et al., 2011; Tsai & Coleman, 2007). Participants also mentioned how health constraints, mainly pre-existing issues as well as including mental health constraints such as stress and anxiety, had constrained participation (Table 26).

Constraint strength was also found to differ significantly based on gender (Table 28). Compared to males, females reported significantly stronger overall constraints, as well as significantly stronger intrapersonal constraints. Of the intrapersonal constraints, females reported significantly stronger constraints concerning: a lack of motivation/interest, a lack of self-confidence, participation being too fatiguing, and health problems. Similar gender differences have been reported in previous studies (Abdullah et al., 2005; Mirsafian, 2014; Ramírez-Vélez et al., 2015; Young et al., 2003; Yusof & Shah, 2007). Qualitative results also support the greater influence of constraints on females, with one mentioning how she was constrained from working out at night alone due to safety concerns.

Females also reported significantly stronger constraints concerning their friends disliking participation. There is potentially a link between the significance of females' friends disliking participation and intrapersonal constraints, as intrapersonal constraints would decrease the pool of potential female friends willing to participate. Qualitative results reinforce the impact of interpersonal constraints, mainly a lack of partners due to not knowing anyone or peers' disinterest in *participation*, which were both particularly prevalent amongst university accommodation residents. Exactly why peers aren't interested was not mentioned, but variations in the motives associated with different activities suggest that some individuals' interests will simply not match up with their peers'.

Also related to constraints, is a change in priorities following the *transition*, which is a time related theme that emerged from the qualitative analysis. Most participants described how they had prioritised their studies over *participation*, with some also prioritising socialising over *participation* as well. In reality, for much of the year, perhaps with the exception of exam period, most students should have the time to comfortably take care of their studies and other commitments as well as be physically active. However, during the *transition* the routine students are used to at

secondary school becomes more irregular, students often end up with more unstructured time, and time management becomes more important.

For some, the *transition* is associated with increased transportation constraints attributable to either the loss of access to a vehicle and/or the absence of someone to transport oneself to and from activities. For example, a female university accommodation resident commented: “[Because] I did not have car it made it hard to get to [rowing] trainings and therefore I could no longer participate”.

Though the loss of personal access to a vehicle may be a real constraint, the absence of someone to facilitate transport may be merely anticipated. This is because in most cases students could continue to participate if they were educated how to negotiate perceived transport related constraints.

5.8. Limitations

The results of the present study should be interpreted with a degree of caution. Most limitations are shared with the existing literature, including: generalisability to other NZ and international tertiary institutions; the use of self-reported measures; and, a cross sectional design. A major limitation of this study was the small sample size resulting from many students not receiving the initial email due to the university’s spam filter, and accumulated survey fatigue, thereby limiting the depth of analysis that was possible. Finally, data is correlational, and causal inferences cannot be drawn. Further limitations stem from the reduced length of the motives, negotiation, and constraints instruments and the yet unanswered questions regarding the theories that underpin these constructs. Despite these limitations, this research has theoretical importance, and has implications for the maximisation of student physical activity. These implications are discussed below, followed by a discussion regarding future research recommendations.

5.9. Theoretical implications

The results of this study offer further insight into the theoretical underpinnings of motives, negotiation strategies, and constraints, and the relationship(s) between these constructs and physical activity.

Contrary to popular beliefs, negotiation, rather than motives, would appear to have the greatest positive influence on physical activity. That negotiation mediates the relationship between motives and physical activity implies that in future the concept of negotiation should be considered when assessing the relationships between motives and physical activity. Also related to motives, the *participation* motives of students appear to support SDT, in that they reflect the needs for competence, relatedness, and autonomy (Weiss & Amorose, 2008), and motive factors cannot easily be defined as intrinsic or extrinsic, supporting SDT's assumption that motives fall upon an intrinsic-extrinsic continuum (Lauderdale et al., 2015).

In terms of negotiation, several theoretical implications emerged. First, the relationship between negotiation factors raise doubts as to the existence of a higher-order construct of negotiation. Next, in support of Jackson and Rucks (1995), though most constraints appear to be negotiated using a corresponding strategy, some constraints are negotiated tangentially rather than directly, indicating that negotiation strategies cannot be predicted based on the type of constraints. Another theoretical implication is the evidence that changes in *participation* patterns may represent a negotiation factor in its own right. Also, the emergence of such supports Jackson's (2000) proposition that life transitions, such as the *transition*, provide new opportunities for constraint negotiation. To the authors knowledge this study is the first to support this proposition. Theoretical implications also emerged concerning the relationship between constraints and negotiation. Interpretation of the findings lends support to the notion that there is a two directional relationship between negotiation and constraints, whereby constraints trigger negotiation, and negotiation reduces constraints.

In contrast to existing theories (Crawford et al., 1991; Godbey et al., 2010), time constraints would appear to represent a distinct type of constraints and/or bridge intrapersonal, interpersonal and structural constraints. This may in part be due to the anticipation of interpersonal, structural, and time constraints during the transition into a new stage in life, which may act as antecedent constraints. One example of this is the emergence of the prioritisation of one's studies, and to a lesser extent socialising, over physical activity. Also relating to constraints, the results of this study would appear to support a multiple-factor model, which provides a more detailed specification, rather

than a second-order model, which may oversimplify constraints and not be theoretically sound.

5.10. Practical implications

The present findings support those of previous studies indicating a significant decrease in students' *participation* following the *transition*, and that a large number of students are insufficiently active. This raises questions about the effectiveness of tertiary institutions' initiatives to foster physical activity among transitioning students. Further questions arise as to what governments and councils are doing, or could do, to minimise the decrease in *participation* given the potential benefits of doing so, let alone the costs of inaction.

In light of the significant decrease in *participation* following the *transition*, remaining practical implications concern findings that provide insight that could help shape initiatives to encourage/facilitate tertiary students to initiate, maintain, or increase *participation* following the *transition*. From a practical perspective, collectively the findings suggest that efforts should be spent on altering and minimising the perceptions of constraints, equipping students with the skills and resources to successfully and consistently negotiate constraints, and motivating students to initiate, maintain, or increase physical activity.

This study offers new insight into how students' *participation* preferences and patterns change following the *transition*. This gives tertiary institutions an insight that should inform decision-making regarding the allocation of resources to ensure that students' needs are met and satisfied. Students in this study would appear most interested in opportunities to participate in individual physical activities, such running, going to the gym, etc., as well as less competitive sporting activities. A key finding is the recommendation that tertiary institutions to invest more time and resources into promoting activities that meet student needs.

The prevalence of participation in different types of physical activities may also inform policy-making decisions. For starters, informal sport remained relatively popular following the *transition*. As such, institutions should ensure that facilities and spaces for students to participate in such activities are made available at viable times. The prevalence of membership to university and external sport clubs is relatively

similar, and very few participants were a member of both a university and an external sport club. This is certainly not a bad thing as university sport clubs are unlikely to have the capacity to accommodate all students. In this case what this does suggest, however, is that certain sports do not have a university club, local students are loyal to their existing club(s), and some students opt to join external clubs even when a university option is available. That students are active should be of greater importance to universities than whether they are university sport club members. Therefore, institutions should encourage students to stay active regardless of whether they play for a club associated with the institution, promote sport clubs where there is not a university club, and universally recognise the achievements of their students as opposed to university sport club members.

Participation was found to vary based on socio-demographic variables, in particular one's living situation, which plays an important role in the *transition*. Tertiary institutions should consider how they can include non-university accommodation residents in university sport competitions which, aside from getting students more active, would potentially increase their sense of belonging and identity to the institution. Gender was also shown to influence *participation*. In particular findings raise concerns about the pathway for females to continue to play sport at a relatively less competitive level following the *transition*. Therefore, institutions consider ways in which they can provide females with the opportunity to participate in sporting activities that are female only, relatively less competitive, affordable, and convenient.

In terms of the practical implications of findings relating to motives, the takeaway message is that one size does not fit all, and it should be appreciated that an individual's motives are just that, individual. In other words, a universal motivational profile does not seem to exist for students experiencing the *transition*. The importance of individual motives varied between genders and among those involved in different physical activities. This highlights that the motivational profile of participants in particular types of physical activities should be considered when marketing or promoting such. By way of example, university sport competitions could be marketed as an opportunity to spend time with friends and meet new people, whereas gym and fitness activities could be promoted as providing an opportunity to, in participants'

own words, 'de-stress' and 'escape' from one's studies for a bit. In addition, enjoyment consistently emerged as the most important motive, and enjoyment was significant. However, enjoyment was a significantly stronger motive for active participants, which potentially implies that less active students either do not enjoy physical activity, or have not found a physical activity that they enjoy. This highlights the importance that institutions assist students in finding physical activities that they enjoy, and ensure students' experiences are enjoyable.

Interpersonal strategies were a key differentiator between participants and non-participants in most types of physical activities. Furthermore, the positive influence of others and interpersonal strategies emerged as themes from qualitative analysis. The implication of this finding is that, to a certain extent, people are the company they keep. Thus, deliberately integrating physical activity into the tertiary institution's culture, and therefore students' lives, should promote physical activity throughout the university and wider community.

As discussed, the qualitative findings suggest that changes in *participation* patterns/preferences may represent a separate negotiation factor themselves, especially in populations experiencing considerable changes to aspects of their lifestyle. This suggests that tertiary institutions should not assume students will continue to participate in the same way or in the same activities as in the past, and should encourage all students to find activities that they can enjoy in conjunction with their studies.

Intrapersonal constraints emerged as most important after time constraints. Intrapersonal constraints are perhaps the most difficult for any individual to negotiate on their own, which why is key that institutions have an understanding of students' *participation* motives, the ability to inspire confidence in students, and provide students opportunities to learn new skills. Females perceived significantly greater intrapersonal constraints compared to males, as well as significantly greater constraints associated with friends disliking *participation*, which may in fact stem from females' peers being intrapersonally constrained. This potentially highlights the needs for female-focused initiatives that help them overcome intrapersonal constraints.

With respect to time, institutions should consider how they can help students manage their time. This could be achieved by understanding when students want to be

physically active, and ensuring that facilities are operational and programs are available at those times. Most importantly tertiary institutions should ensure that students understand their studies do not have to be prioritised at the expense of being active, and that physical activity can benefit academic performance (Khan et al., 2012). Finally, a lack of information emerged as an important constraint from both qualitative and quantitative data, which highlights the importance that pertinent information regarding *participation* opportunities is promoted and readily accessible through appropriate channels.

5.11. Future Research Recommendations

Physical activity tends to decline across the lifespan. However, this decline is not linear, as physical activity decreases considerably during certain life transitions. Understanding what influences physical activity, and understanding what differentiates those who are insufficiently active from those who are active, should offer insight into how physical activity can be increased.

Researchers can continue to advance the knowledge base concerning factors that influence *participation* in a number of ways. These include: collecting data from large samples to increase the array of analysis options, such as structural equation modelling; collecting an array of information on participants' socio-demographic variables; and, if available, using objective *participation* measures such as accelerometers, pedometers, or fitness trackers.

As shown in this study, and in the literature, socio-demographic variables can have significant relationships with physical activity and *psychological constructs*. As such, as long as the sample size allows for it, researchers should test for differences on all socio-demographic variables they have collected information on. Socio-demographic variables worthy of consideration are highlighted in chapter two.

This study has shown that *psychological constructs* vary significantly based on the types of physical activities individuals participate in. Thus, future research should either be highly specific and focus on a particular type of activity or, like this study, take a broader approach and examine what types of activities individuals participate in. Moreover, in addition to collecting information on physical activity duration and frequency, the frequency of resistance training should also be assessed to allow

comparison of how many participants meet national physical activity guidelines that incorporate resistance training along with moderate physical activity. To date, this is what this study, previous studies, and NZ government ministries (e.g. Health, and Sport and Recreation) have all neglected to do.

When investigating *psychological constructs* alone, as well as their relationships with one another and physical activity, future researchers may want to consider further development of motives, negotiation, and constraints instruments. The FA results of the present study, in particular the exclusion of items, offer insights into ways in which such instruments could potentially be improved.

In the case of the motives, the inclusion of enjoyment in the 'competition' item, and the double-barreled nature of the 'prevention or recovery from illness/injury' item may have confused some participants and resulted in the exclusion of these items from FA. If items were reworded and additional items included it is possible that these items, and the 'enjoyment' item, may either load on the existing factors, pull away items from the existing factors to create a new factor, or form a new factor in their own right. Each of these items were included within the EMI-2 as dimensions, which should provide researchers with ideas as to which items may warrant consideration for inclusion.

On the topic of potential motive instrument improvements, the emergence of a psychological factor is particularly interesting since two of its four items are excluded from the EMI-2. Moreover, psychological motives also emerged from the qualitative data analysis where participants described how they participated in order to balance and de-stress, relax, and have a break or to get away from study. Psychological motives may have been overlooked in the past due to their intangible nature, and the lack of association of psychological motives with physical activities resulting in them being less salient to participants compared to obvious physical motives, motives associated with physical prowess, and motives stemming from interpersonal interactions associated with physical activity, all of which are trumpeted as benefits of *participation* (Kelinske, Mayer, & Chen, 2001). In light of the emergence of psychological motives as important to students' *participation* future researchers may want to further investigate such motives.

As far as negotiation measurement, five items were excluded during FA, including: 'skill acquisition', 'transport arrangement', 'participation in less competitive activities', 'participation in less expensive activities', and 'information acquisition'. This is likely as a result of the condensed nature of the instrument. In future, aside from reintroducing some of the excluded items, since most varied based on participation or socio-demographic variables, researchers may want to consider inclusion of items relating to what previous researchers have referred to as 'changing leisure aspiration' strategies (A. C. Shaw et al., 2012; White, 2008). To date they have yet to be included in a student focussed study, and have been excluded by most studies. This suggestion is inspired by the emergence of changes in *participation* patterns, which would appear to approximate changes in leisure aspirations. If more items were to be included alongside items such as 'participation in less competitive activities', and 'participation in less expensive activities' a new factor may emerge. Potential items could include: 'participation in more individual/independent physical activities and/or sports e.g. running/gym', 'participating in more team/group based physical activities and/or sports', and 'participation in more social physical activities and/or sports'. Finally, qualitative results suggest that future researchers may also want to reconsider rewording items, for example, 'less expensive' could be replaced with 'affordable'.

Also related to potential negotiation measurement improvements, though time and financial items loaded on the same factor, future researchers may want to further examine whether this is replicable when additional time and financial negotiation items are included. Moreover, researchers may want to reconsider rewording time-related items. Rather than framing items in relation to 'cutting short' commitments for alternative activities, they may want to consider framing them in terms of 'prioritising' *participation* over various alternatives corresponding with time constraint items. This suggestion stems from qualitative data where prioritisation of study and social commitments over *participation* emerged as a theme, and cutting short time to participate was not mentioned. Thus, it may be more pertinent to examine how frequently the opposite occurs.

Finally, the underlying structure of the negotiation construct has not been examined in depth, and a study has yet to produce a second-order model that provides evidence that factors actually represent a higher-order construct of negotiation. The

next step in this process is for further qualitative research to be undertaken to guide the development of more comprehensive negotiation instruments. Following this, non-confirmatory FA should be used to examine the underlying structure of the instrument before any confirmatory or higher-order analyses are conducted.

The findings of the present study suggest that much is to be gained by further improving the measurement of constraints. Firstly, more recent studies have employed constraint instruments with far more items than the present model and have demonstrated that multiple-factor models can emerge (Alexandris & Carroll, 1997a, 1997b; Chung et al., 2013; Liu et al., 2013; Masmanidis et al., 2009; Masmanidis et al., 2015). Prior to examining the factor structure of constraints, further research into conceptual standing of time-related constraints is required. As far the measurement of time, a number of more novel constraint items have emerged from the non-CT based literature which have an association with time, such as fatigue related constraints (i.e. tiredness, a lack of energy, a lack of sleep), sedentary leisure, and environmental constraints such as bad weather, the climate, and darkness. Fatigue will likely influence how an individual spends their energy, and therefore time. Environmental constraints impact the number of hours, and times at which people may be willing to participate, as do safety related constraints. Sedentary leisure, a constraint only mentioned by Chan Sun and Azmutally (2013), accounts for alternative leisure activities. In addition to the time-associated items, several other constraints also emerged from the non-CT based literature that may warrant consideration for inclusion in future constraints research and theories. These include: fear of injury; safety concerns; a lack of encouragement from friends and others; and, an abundance of unhealthy choices. In addition, constraints concerning a lack of knowledge and a lack of information could be examined in conjunction in future research, rather than separately as they have been in the past.

There would appear to be benefits of incorporating qualitative procedures, and EFA prior to CFA in any future development of psychological instruments. Instruments should be context specific, i.e. specific to the country and sub-population demographic at the very least. Researchers could also attempt to determine whether psychological construct factors pertain to higher-order factor model, or models where there is a greater number of factors.

Additional longitudinal research would appear to be required in relation to how *participation*, motives, negotiation, and constraints change during the *transition*, as well as other life transitions such as from secondary school or tertiary study to the workforce, from the workforce into retirement, and even the transition into parenthood. Along similar lines, NZ based research into other sub-populations, such as children, recent graduates, adults, and the elderly would also be valuable. Comparative studies, such as the comparison of *participation* and *psychological constructs* of students from different institutions may offer insight into the strengths and weaknesses of different contexts. Finally, conducting interventions to maximise *participation* in specific populations using the findings from the literature, including this study, as a guide as to what interventions will be the most effective, is another line of research worthy of consideration.

Chapter 6: Conclusion

This study's overarching purpose was to produce insight that could help shape initiatives to encourage and facilitate tertiary students to initiate, maintain, or increase *participation* following the *transition*. The use of a component mixed-methods design proved valuable, with quantitative data complemented by qualitative data revealing new findings such as the changes in *participation* patterns, as well as motives, and negotiation strategies constraints that were not encompassed by quantitative measures.

Most worryingly, *participation* had decreased significantly following the *transition*, leaving many students insufficiently active. In addition to the reduced *participation*, students' *participation* preferences and patterns appeared to change following the *transition*. Motives, negotiation strategies, and constraints were each revealed to influence *participation* in a variety of ways. Importantly, negotiation was found to mediate, likely fully, the relationship between motives and *participation*. Moreover, interpretation of the findings lends support to the notion that there is a two directional relationship between negotiation and constraints, whereby constraints trigger negotiation, and negotiation reduces constraints. Furthermore, individual motives, negotiation strategies and constraints were found to vary significantly based on socio-demographic variables as well as between different types of physical activities.

There is clearly a need for institution-specific vision with strategic plans targeted at increasing student *participation*. Such plans need to be consistent with and supported by central government policies and initiatives. The key conclusions that those responsible for, or interested in, getting tertiary students more active should appreciate are:

1. Students' *participation* decreases significantly following the *transition*.
2. Students' *participation* patterns and preferences change following the *transition*.
3. Students' motives shift from more extrinsic *pre-transition* to more intrinsic following the *transition*.

4. Motives are individual. A universal motivational profile does not seem to exist for students, highlighting the need to tap into a variety of motives when promoting physical activities.
5. Motives do not translate into *participation*. Above motives, students require the skills, knowledge and resources to negotiate constraints for greater physical activity to occur.
6. A perceived lack of time emerged as the greatest constraint to *participation*, but time management, rather than a lack of time, is likely to be the real constraint in most cases (Mercatante, 2009).
7. Following time constraints, intrapersonal constraints have the greatest negative impact on *participation*, and are perceived as significantly greater by females.

With this information, those responsible for, or interested in, getting tertiary students more active should be able to start to formulate targeted evidence-based initiatives to encourage/facilitate tertiary students to initiate, maintain, or increase *participation* following the *transition*. With respect to changes in *participation* preferences and patterns, such changes should be encouraged and facilitated by allocating resources accordingly to provide a diverse range of activities that suit students' preferences. In terms of motives, when promoting physical activities institutions should appreciate that motives are very much individual, but that some motives are of greater importance to females, and that certain activities offer the opportunity to satisfy particular motives and maximise the chances of enjoyment. Institutions should consider ways in which they can alleviate the perception, and/or facilitate the negotiation, of constraints, in particular intrapersonal and time constraints. Some ways in which intrapersonal constraints can be alleviated stem from self-efficacy theory (Bandura, 1977), whereby students can be provided with assistance in the forms of vicarious experience and verbal persuasion (e.g. observing and hearing about peers successfully negotiating constraints) and guided mastery through exposure to convenient and enjoyable forms of physical activity (Bray, 2007). Time constraints can also be alleviated by assisting and educating students as to how manage their time, perhaps by promoting a physical activity planning brochure (Bray et al., 2011).

In summary, until society places a priority on life-long physical activity, as opposed to merely youth sport and recreation participation, and high performance sport, the physical activity of New Zealanders is unlikely to increase, and in fact may well to continue to decrease. Minimising the decline during the *transition* is just one area where significant inroads can be made. Perception is often reality, so until students' perceptions are changed, the reality is that other activities will be prioritised at the expense of *participation*.

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Appendices

Appendix A: Evidence of Ethical Approval

University of Canterbury Human Ethics Committee (UC HEC) approval



HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen
Email: human-ethics@canterbury.ac.nz

Ref: HEC 2015/129

29 October 2015

Professor Richard Light
School of Sport & Physical Education
UNIVERSITY OF CANTERBURY

Dear Richard

The Human Ethics Committee advises that your research proposal "Factors influencing first-year tertiary student sport and physical activity participation: constraints, negotiation strategies and motives" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 22 October 2015.

Best wishes for your project.

Yours sincerely

A handwritten signature in black ink, appearing to read 'L. MacDonald'.

Lindsey MacDonald
Chair
University of Canterbury Human Ethics Committee

Auckland University of Technology Ethic Committee (AUTEC) approval



AUTEC Secretariat

Auckland University of Technology
 D-88, WU406 Level 4 WU Building City Campus
 T: +64 9 921 9999 ext. 8316
 E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

10 November 2015

Simon Walters
 Faculty of Health and Environmental Sciences

Dear Simon

Re Ethics Application: **15/400 Factors influencing first year tertiary student sport and physical activity participation: constraints, negotiation strategies and motives.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 10 November 2018.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 10 November 2018;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 10 November 2018 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,



Kate O'Connor
 Executive Secretary
 Auckland University of Technology Ethics Committee

Cc: Oliver.Wilson@xtra.co.nz

Appendix B: Evidence of Survey Approval**Erna Gardner**

13 October 2015 at 09:32

EG

To: Olly Wilson

Factors Influencing First-Year Tertiary Student Sport and Physical Activity - permission granted

Dear Olly,

As secretary to the University of Canterbury Survey Reference Group, I can confirm that the survey **Factors Influencing First-Year Tertiary Student Sport and Physical Activity** has the permission of the Survey Reference Group to be carried out as described in the application, and has been added to the UC Survey Calendar for 2015.

Kind regards,
Erna Gardner

Survey Reference Group Secretary
Academic Services Group
University of Canterbury
Private Bag 4800, Ilam
Christchurch.

+64-3-364 2987 extn 6850

Appendix C: Tertiary Student Insufficient Physical Activity Study Findings

Author(s)	Participants	Findings
Pauline (2013)	871 American undergraduates	35% were insufficiently active, and 18% did not engage in any MVPA
McArthur and Raedeke (2009)	636 American students	17% were largely sedentary, 33% reported some activity, and 50% were regularly active
Young et al. (2015)	655 American students	35% were physically inactive, and only 11% were sufficiently physically active
Downes (2015)	106 American students	86.6% were insufficiently active
Suminski et al. (2002)	2836 ethnically diverse American undergraduates	46.7% (males 40.3%, females 53%) of did not engage in VPA and 16.7% (males 11.3%, females 22%) of were physically inactive.
Minkel (2010)	215 female American students	25% were inactive, and only 18.6% were sufficiently physically
McElroy and Jordan (2014)	832 typical-age (≤ 23 years) American female students identifying as LBQ	60% were insufficiently active
Mirsafian et al. (2014)	1,120 female Iranian students	Two thirds did not participate in any sport
Mirsafian (2014)	1,315 Iranian students 1,893 Hungarian students	68.3% did not participate in any sport 41% did not participate in any sport
Atikovic et al. (2014)	543 Bosnian and Herzegovinian undergraduates	9.4% of males and 28.2% of females did not participate in sport regularly
Romaguera et al. (2011)	2051 Spanish students	31.6% of male and 51.6% of female students were physically inactive
Schmidt (2012)	152 Swedish Business students	28.8% of males and 28.4% of females were insufficiently active

Daskapan, Tuzun, and Eker (2006)	303 Turkish Caucasian sport science undergraduates	44% of males and 78% of females insufficiently active
Dodd et al. (2010)	410 UK students	70% were insufficiently active (males – 51.9%, females – 76.5%)
Tsai and Coleman (2007)	1,282 Australia students, and 1336 Hong Kong students	26% of student's from both countries were non-participants in active recreational activities
Chan Sun and Azmutally (2013)	358 Mauritian students	41% were insufficiently active
Awadalla et al. (2014)	1,252 Saudi Arabian Health students	58.0% were physically inactive
Seo et al. (2012)	12,137 students from Taiwan, Hong Kong, South Korea, Singapore, and Malaysia	Levels of physical inactivity were as follows: Singapore (7.2%), Malaysia (8.0%), Taiwan (13.5%), Hong Kong (16.8%), and South Korea (28.5%)

Appendix D: Questionnaire**Section A: socio-demographic information*****Data provided by Enrolment Services***

- Age
- Gender
- Ethnicity
- Domestic vs. international
- Course codes
- Last year of secondary school, and secondary school attended
- First year of tertiary study
- First person in family (or not)
- GPA

Data gathered using survey

X. Please enter your student ID/usercode (required). - Compulsory text entry. Only provided to those answering the open-link questionnaire

1. What is your living situation whilst studying at UC?
 - UC Accommodation (i.e. hall of residence)
 - Flatting
 - Parental/ Guardians home
 - Own Home
 - Home-stay
 - Other (text entry)

2. Did any physical disabilities inhibit / prevent you from participating in sport and physical activities this year?
 - Yes
 - No

3. On average, whilst studying, how many hours per week paid of employment did you have? - Text entry (hours). Numerical entry only/enforced

4. On average, whilst, studying how many hours per week did you undertake volunteer activities? - Text entry (hours). Numerical entry only/enforced

Section B: Participation

In this section we would like you to consider your participation in sport and physical activities at secondary school compared to your first year at UC.

Secondary School Participation

On average, *how many times per week* did you participate in physical activities and sports and during your final year of secondary school? - Text entry (times/week). Numerical entry only/enforced

On average, *how many hours* did you spend participating in in physical activities and sports during your final year of secondary school? - Text entry (hours). Numerical entry only/enforced

What types of physical activities and sports did you participate in during your final year of secondary school? (please select all that apply)

- Informal sport (i.e. mucking around with friends, family or on my own)
- School sport teams
- Sport clubs outside of school
- Representative (regional or national) sport
- Gym and fitness activities

Please feel free to list the physical activities and sports that you participated in during your final year of secondary school. - Text entry

Tertiary Participation

On average, *how many times per week* did you participate in physical activities and sports this year? - Text entry (times/week). Numerical entry only/enforced

On average, *how many hours* did you spend participating in physical activities and sports during this year? - Text entry (hours). Numerical entry only/enforced

What types of physical activities and sports did you participate in this year whilst studying at UC? (please select all that apply)

- Informal sport (i.e. mucking around with friends, family or on my own)
- UC Sport Clubs
- Sport clubs outside of UC
- Representative (regional or national) sport
- UC Sport Competitions (i.e. Social Sport Competitions, or UC Sport Leagues)
- Gym and fitness activities

Please feel free to list the physical activities and sports that you participated in during 2015. - Text entry

Section C: Psychological constructs

For the remainder of this questionnaire we would like you to reflect on your feelings and perceptions towards participation in physical activities and sports this year.

Motives

Please rate your agreement with the following statements in relation to why you personally participate in physical activities and sports.

1. For the personal challenge
2. To improve and learn new skills and abilities
3. To build strength and endurance
4. To increase or maintain speed, agility and flexibility
5. To enjoy the competition
6. To relieve/manage stress and tension
7. To relax physically and mentally
8. To escape from everyday life responsibilities
9. To spend time with friends

10. To meet new and different people/ make new friends
11. To gain a feeling of belonging
12. For enjoyment
13. To feel invigorated/revitalised
14. To achieve/support a more balanced/healthy lifestyle
15. To prevent or recover from illness/injury
16. To control or achieve my ideal/comfortable body weight
17. To improve my physical appearance/attractiveness
18. To gain recognition for my accomplishments
19. To gain the respect of others

Negotiation Strategies

How frequently did you use the following strategies to enable you to participate in physical activities and sports?

1. I organised myself effectively
2. I cut short time for social commitments
3. I cut short time on studies
4. I tried to budget money to participate
5. I participated in less expensive activities
6. I got a job to earn money to participate
7. I willingly participated with people I did not know
8. I encouraged friends and others to participate with me
9. I coordinated participation with my friends
10. I participated with people of the opposite gender
11. I arranged transport to participate
12. I improved my physical fitness
13. I improved my eating habits
14. I got more sleep
15. I acquired new skills
16. I sought out information on participation opportunities
17. I participated at a less competitive level than in the past

Constraints

Please rate your agreement with the following statements in relation to – I am constrained (inhibited or prevented) from participating in physical activities and sports by.

1. A lack of interest/ motivation to participate in physical activities and sports
2. A lack of skills to participate
3. A lack of the knowledge of where to participate
4. A lack of self-confidence
5. Participation is too fatiguing
6. Health problems
7. Cultural beliefs
8. A lack of partners (friends and others) to participate with
9. Friends dislike participating
10. Potential co-participants lack time
11. A lack of time due social commitments
12. A lack of time due to study obligations
13. *A lack of time due to work commitments
14. *A lack of time due to volunteering commitments
15. University sport and recreation programmes are sub-standard
16. University facilities are inadequate
17. University facilities are inconveniently located
18. Equipment required is unaffordable
19. Participation is unaffordable
20. Transportation takes too much time
21. A lack of transport to facilities

*based on logic from section 1 (i.e. will only appear if the participant works or volunteers).

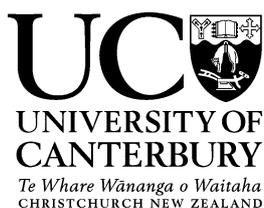
Section D: Transition Effects

The remaining questions offer you the chance to express in your own words how your participation, motives, use of strategies to participate, and constraints to

participation in physical activities and sports changed following the transition from Secondary School to UC.

1. Following the transition from Secondary School to UC, how did your *participation* in physical activities and sports change? - (Text entry)
2. Following the transition from Secondary School to UC, how did your *motives* for participation in physical activities and sports change? - (Text entry)
3. Following the transition from Secondary School to UC how did the *strategies* you use to participate in physical activities and sports change? - (Text entry)
4. Following the transition from Secondary School to UC, how did the *constraints/barriers/obstacles* to participation in physical activities and sports change?
 - Options:
 - Decreased
 - Did not change
 - Increased
 - Why? (Text entry)
5. Do you have any further comments to make about sport and recreation at UC? (please comment below). - (Text entry)

Appendix E: Participant Information Sheet



Dr Jenny Clarke

School of Sport and Physical Education

Telephone: 64 3 345 8329

Email: jenny.clarke@canterbury.ac.nz

10/11/2015

Factors Influencing First-Year Tertiary Student Sport and Physical Activity Participation: Constraints, Negotiation Strategies, and Motives.

Participant Information Sheet

My name is Dr Jenny Clarke, I am a Senior Lecturer in the School of Sport and Physical Education. The purpose of this research is to collect information about first-year student Sport and Physical Activity Participation (*participation*) to enable the University of Canterbury (UC) to effectively encourage/facilitate initiation, continuation, or even increase student *participation* while studying at UC. By providing information about existing sport and recreation programmes at UC, and providing an insight into student *participation*, this research will help to shape the future provision of sport and recreation facilities and opportunities at UC.

As a part of this research project confidential demographic data on participants will be provided by UC Enrolment Services to Dr Jenny Clarke to facilitate demographic analysis of responses. All data received through this survey, including demographic data, will be fully anonymised upon closure of the survey. Only anonymous data will be provided to the researcher (Olly Wilson, Masters Student) to carry out the analysis.

My involvement in this project is the distribution of this survey, and supervision of the analysis of data gathered in the survey. The survey will record your response to a number of questions related to *participation* in sport and recreation this year and will take only ~10min of your time.

Completion of the survey is not anticipated to cause any mental or emotional stress.

Findings will be made available for all students to access online following the analysis of the data, however no information will be provided which might allow individual participants to be identified.

Participation is voluntary and you have the right to withdraw at any stage without penalty by emailing jenny.clarke@canterbury.ac.nz by November 24th. If you withdraw, I will remove all information relating to you upon closure of the survey (November 24th).

The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public. Every effort will be made to ensure anonymity and confidentiality. Participants will not be able to be identified by name by the research team. Details provided for the prize draw via a separate link at the end of the survey will not be traceable to response of participants. UC will have access data during both the data collection and analysis stages, which will be handled by myself. Olly Wilson, a Masters student working with UC and Auckland University of Technology (AUT), will have access to anonymised data that is agreed necessary for the completion of his Thesis. Any further access to data granted to Olly, or any other researcher, is subject to negotiation and approval by Professor Richard Light and the UC Human Ethics Committee (HEC). The data will be password protected and stored on the researchers' computers. On completion of the study, the data will be deleted from their computers and will be securely stored in the UC College of Education – again password protected. After completion of analysis the raw data will be stored for ten years. A thesis is a public document, and the analysis carried out towards Olly's Masters as part of this study will be available through the UC Library.

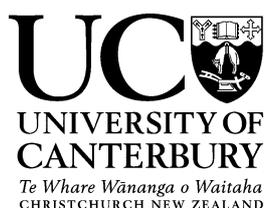
The project is being carried out: as a requirement for a Masters of Sport and Exercise (AUT) by Olly Wilson, under the supervision of Dr Jenny Clarke, who can be contacted at using the details above. It will also be used for further UC research and potentially for marketing purposes by UC. Jenny will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the UC HEC and participants

should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to participate in the study, you are asked to select the 'agree' button below to commence the survey. Completion of the survey represents an indication of consent.

Jenny Clarke



Appendix F: Consent Statement

Dr Jenny Clarke

School of Sport and Physical Education

Telephone: 64 3 345 8329

Email: jenny.clarke@canterbury.ac.nz

10/11/2015

I have been given a full explanation of this project and have had the opportunity to ask questions. I understand what is required of me if I agree to take part in the research.

I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.

I understand that any information or opinions I provide will be kept confidential to the researchers, and all others who access the data, and that any published or reported results will not identify the participants. I understand that a thesis is a public document and will be available through the UC Library.

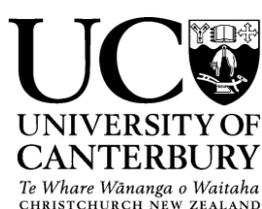
I understand that all data collected for the study will be kept in locked and secure facilities and/or in password protected electronic form and will be destroyed after ten years.

I understand the risks associated with taking part and how they will be managed.

I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.

I understand that I can contact the researcher Jenny Clarke using the contact details above for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

By clicking the 'agree' button below, I agree to participate in this research project.



Appendix G: Differences in Psychological Constructs based on Type of Physical Activity

Table 30: *Differences in Motives Based on Type of Physical Activity*

Type of Physical Activity	Motives	Non-participants/ members	Participants/ members	<i>p</i>	η^2
Informal sport	<i>Interpersonal</i>	3.81 (1.32)	4.29 (1.24)	.011	.053
	Spend time with friends	4.61 (1.74)	5.50 (1.63)	.005	.064
	Meet new people/make new friends	4.00 (1.80)	4.72 (1.62)	.023	.043
	Enjoyment	5.67 (1.51)	6.18 (1.28)	.049	.032
University sport club	Improve and learn new skills and abilities	5.01 (1.49)	5.68 (1.36)	.026	.042
	Meet new people/make new friends	4.17 (1.65)	5.09 (1.76)	.008	.057
	<i>Social recognition</i>	3.29 (1.62)	4.18 (1.59)	.012	.052
	To gain the respect of others	3.18 (1.71)	4.12 (1.89)	.010	.055
	To gain recognition for personal accomplishments	3.39 (1.73)	4.12 (1.67)	.038	.036
	Competition ^a	4.85 (1.85)	6.03 (1.38)	.000	.087
External sport club	Competition ^a	4.93 (1.84)	6.16 (1.31)	.000	.109
Representative sport	Strength and Endurance ^a	5.62 (1.49)	6.36 (0.67)	.007	.071
	Spend time with friends ^a	5.08 (1.79)	5.73 (0.65)	.019	.050
	Enjoyment ^a	5.89 (1.43)	6.82 (0.41)	.000	.178
	Competition ^a	5.04 (1.83)	6.64 (0.51)	.000	.287
University sport competition	Improve and learn new skills and abilities	4.82 (1.83)	5.73 (1.65)	.006	.061
	<i>Interpersonal</i>	4.16 (1.47)	4.96 (1.32)	.003	.071
	Spend time with friends	4.88 (1.70)	5.54 (1.70)	.037	.036
	Meet new people/make new friends	4.11 (1.80)	4.92 (1.50)	.011	.053
	To gain a sense of belonging	3.51 (1.67)	4.42 (1.61)	.004	.069
	<i>Social recognition</i>	3.28 (1.60)	3.88 (1.67)	.048	.032
	To gain recognition for personal accomplishments	3.18 (1.68)	3.85 (1.92)	.043	.034

	Competence-mastery	4.98 (1.40)	5.59 (1.09)	.008	.057
	Strength and endurance ^a	4.95 (1.63)	6.09 (1.16)	.000	.120
	Speed agility and flexibility	4.95 (1.68)	5.55 (1.31)	.032	.038
	Spend time with friends	5.60 (1.65)	4.88 (1.72)	.027	.040
Gym and fitness activities	Body/health related	4.60 (1.40)	5.37 (1.42)	.005	.064
	Weight management	4.02 (1.81)	5.12 (1.93)	.003	.072
	Physical appearance/attractiveness	4.37 (1.76)	5.09 (1.79)	.036	.037
	Psychological	4.77 (1.44)	5.32 (1.23)	.029	.039
	Stress management	4.77 (1.81)	5.49 (1.54)	.023	.043
	Prevention or recovery from illness/injury	3.14 (1.71)	3.78 (1.70)	.049	.032

^a Equal variances not assumed

Table 31: Differences in Negotiation Based on Type of Physical Activity

Type of Physical Activity	Negotiation strategies	Non-participants/ members	Participants/ members	<i>p</i>	η^2
Informal sport	<i>Interpersonal*</i>	4.15 (1.80)	5.15 (1.28)	.001	.087
	Encouragement of friends and others to participate *	4.33 (2.23)	5.40 (1.45)	.004	.069
	Coordination of participation with friends*	4.08 (2.24)	5.25 (1.50)	.002	.079
	Participation with the opposite gender*	4.37 (2.16)	5.35 (1.48)	.007	.060
	Willing participation with strangers	3.82 (2.01)	4.61 (2.03)	.035	.037
	Skill acquisition	4.14 (1.84)	4.85 (1.62)	.028	.040
University sport club	<i>Interpersonal*</i>	4.45 (1.64)	5.51 (1.17)	.000	.117
	Encouragement of friends and others to participate ^a	4.61 (1.95)	5.88 (1.30)	.000	.128
	Participation with the opposite gender ^a	4.70 (1.93)	5.62 (1.44)	.005	.065
	Willing participation with strangers ^a	3.83 (2.01)	5.44 (1.69)	.000	.142
	<i>Time prioritisation and financial management strategies</i>	2.72 (1.28)	3.56 (1.35)	.002	.079
	Cut short time for social commitments	3.28 (1.60)	3.94 (1.43)	.037	.036
	Cut short time on studies	2.93 (1.66)	3.79 (1.63)	.011	.053
	Attempted to budget money to participate	2.67 (1.74)	3.50 (1.97)	.025	.042
	Acquired a job to earn money to participate ^a	2.01 (1.61)	3.00 (2.20)	.021	.045
	Information acquisition	3.98 (2.03)	4.85 (1.71)	.028	.040
Skill acquisition	4.33 (1.77)	5.15 (1.52)	.020	.045	
External sport club	<i>Well-being management</i>	4.51 (1.45)	4.79 (1.12)	.044	.034
	Physical fitness improvement	4.65 (1.84)	5.92 (1.47)	.002	.079
	Eating habit improvement	3.71 (1.73)	4.60 (1.87)	.026	.041
	<i>Interpersonal</i> ^a	4.58 (1.67)	5.38 (1.02)	.004	.070
	Participation with the opposite gender ^a	4.77 (1.91)	5.64 (1.38)	.013	.053
	Skill acquisition ^a	4.34 (1.78)	5.40 (1.53)	.002	.086
Willing participation with strangers	4.08 (2.06)	5.08 (1.85)	.030	.039	

	<i>Time prioritisation and financial management strategies</i>	2.74 (1.28)	3.80 (1.30)	.000	.103
	Cut short time for social commitments	3.27 (1.54)	4.20 (1.56)	.008	.057
	Cut short time on studies	3.01 (1.65)	3.80 (1.73)	.037	.036
	Attempted to budget money to participate ^a	2.65 (1.64)	3.88 (2.24)	.015	.053
	Acquired a job to earn money to participate ^a	2.20 (1.56)	3.32 (2.43)	.017	.052
	Information acquisition	4.00 (1.98)	5.08 (1.78)	.015	.049
	Transport arrangement	3.27 (2.07)	4.92 (2.14)	.001	.095
	Physical fitness improvement ^a	4.77 (1.85)	6.27 (1.10)	.001	.118
	Participation with the opposite gender ^a	4.87 (1.90)	5.73 (0.91)	.017	.054
Representative sport	<i>Time prioritisation and financial management strategies</i>	2.83 (1.28)	4.27 (1.39)	.001	.096
	Cut short time for social commitments	3.37 (1.59)	4.36 (1.21)	.047	.033
	Cut short time on studies	3.05 (1.65)	4.45 (1.57)	.008	.058
	Attempted to budget money to participate ^a	2.74 (1.71)	4.55 (2.38)	.032	.048
	Information acquisition	4.10 (1.98)	5.45 (1.57)	.030	.039
	Transport arrangement ^a	3.42 (2.13)	5.55 (1.75)	.002	.106
	Participated in less competitive activities	4.86 (2.11)	3.00 (2.45)	.007	.060
University sport competition	<i>Interpersonal</i> ^a	4.20 (1.67)	5.57 (1.00)	.000	.211
	Encouragement of friends and others to participate ^a	4.44 (2.06)	5.77 (1.19)	.000	.146
	Participation with the opposite gender ^a	4.32 (1.95)	5.92 (1.13)	.000	.215
	Coordination of participation with friends ^a	4.25 (2.09)	5.58 (1.24)	.000	.141
	Willing participation with strangers ^a	3.81 (2.11)	5.02 (1.73)	.001	.091
	Participated in less competitive activities ^a	4.10 (2.30)	5.60 (1.69)	.000	.127
Gym and fitness activities	<i>Well-being management</i>	3.55 (1.38)	4.69 (1.26)	.000	.150
	Physical fitness improvement	4.00 (1.81)	5.41 (1.66)	.000	.136
	Effective personal organisation ^a	4.14 (1.95)	4.97 (1.33)	.015	.050
	Eating habit improvement	3.12 (1.55)	4.32 (1.78)	.000	.105
	Increased sleep	2.95 (1.48)	4.05 (1.74)	.001	.094

<i>Interpersonal</i>	4.25 (1.68)	5.02 (1.47)	.010	.054
Encouragement of friends and others to participate ^a	4.28 (2.03)	5.35 (1.68)	.004	.068
Coordination of participation with friends	4.28 (1.93)	5.05 (1.86)	.036	.038
Information acquisition	3.44 (1.74)	4.65 (1.99)	.001	.086
Cut short time for social commitments	3.02 (1.44)	3.71 (1.61)	.023	.043

^a Equal variances not assumed

Table 32: Differences in Constraints Based on Type of Physical Activity

Type of Physical Activity	Constraints	Non-participants/ members	Participants/ members	<i>p</i>	η^2
Informal sport	A lack of self-confidence	3.94 (2.04)	3.18 (1.74)	.030	.039
	A lack of skills	3.31 (1.84)	2.65 (1.50)	.034	.037
	Lack of time due to work commitments ^b	5.14 (1.77)	3.04 (1.89)	.044	.035
	Overall	3.13 (0.94)	2.57 (1.01)	.005	.065
	<i>Intrapersonal</i>	3.27 (1.38)	2.48 (1.16)	.004	.069
	A lack of interest/motivation	3.83 (2.04)	2.82 (1.73)	.012	.051
	A lack of self-confidence	3.74 (1.93)	2.85 (1.67)	.021	.046
	Participation is too fatiguing	2.89 (1.65)	2.12 (1.34)	.017	.047
	Health problems	2.86 (2.01)	2.00 (1.50)	.012	.053
University sport club	<i>Structural</i>	2.83 (1.29)	2.31 (1.20)	.045	.033
	Sub-standard university sport and recreation programmes	3.03 (1.69)	2.35 (1.61)	.046	.033
	Inadequate university facilities ^a	2.92 (1.53)	2.12 (1.32)	.005	.065
	A lack of knowledge of where to participate ^b	3.59 (1.81)	2.65 (1.65)	.010	.055
	Inconvenient university facility location ^{a,b}	2.66 (1.61)	2.06 (1.30)	.038	.036
	<i>Intrapersonal</i>	3.26 (1.36)	2.25 (1.07)	.001	.090
	A lack of interest/motivation	3.82 (1.97)	2.48 (1.76)	.002	.084
External sport club	A lack of skills ^a	3.14 (1.70)	2.08 (1.26)	.001	.091
	Participation is too fatiguing ^a	2.92 (1.64)	1.72 (0.98)	.000	.153
	Lack of time due to work commitments ^b	4.94 (1.78)	3.60 (1.88)	.022	.045
	Overall	3.05 (0.98)	2.22 (0.72)	.007	.062
	<i>Intrapersonal</i>	3.15 (1.37)	1.98 (0.78)	.006	.063
Representative sport	A lack of interest/motivation ^a	3.73 (1.98)	1.71 (1.19)	.000	.170
	A lack of self-confidence ^a	3.59 (1.91)	2.45 (1.37)	.025	.051
	Participation is too fatiguing ^a	2.76 (1.62)	1.73 (1.01)	.008	.072

	Potential co-participants lack time ^a	3.10 (1.85)	1.82 (1.25)	.008	.074
	A lack of time due to social commitments ^a	3.47 (1.78)	2.27 (1.01)	.003	.091
	A lack of time due to study commitments	4.68 (1.73)	3.09 (1.38)	.003	.070
	A lack of time due to work commitments ^b	4.90 (1.76)	2.29 (0.95)	.000	.109
	A lack of time due to volunteering commitments ^{a,b}	3.10 (1.86)	1.50 (0.58)	.002	.114
	<i>Intrapersonal</i>	3.25 (1.41)	2.74 (1.24)	.045	.033
University sport competition	A lack of self-confidence ^a	3.77 (1.95)	3.06 (1.73)	.045	.033
	Participation is too fatiguing	2.96 (1.67)	2.23 (1.39)	.013	.050
	Transportation takes too much time	3.00 (1.71)	2.29 (1.44)	.019	.045
Gym and fitness activities	A lack of interest/motivation	4.07 (2.08)	3.26 (1.91)	.032	.038

^a Equal variances not assumed

^b Excluded from FA