Relationships of Social Physique Anxiety and Behavioural Regulations to the Intention-Behaviour Gap Model

by

Izabela Figueiredo

A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Science

Faculty of Kinesiology, Sport, and Recreation

University of Alberta

Abstract

Given the increasing rate of inactive individuals, it is crucial that there is research focused on understanding the factors that may be related to lower exercise behaviour. A number of constructs are known to have a relationship with participation in exercise behaviour, including social physique anxiety, motivational constructs from self-determination theory, and the intention-behaviour gap. The research that has been reviewed for this study demonstrates links between these constructs; however, it has yielded inconsistent conclusions. Accordingly, this study focused on understanding, in more detail, how social physique anxiety and motivational constructs from self-determination theory are related to the gap between intention to exercise and exercise behaviour. The main purpose of this study was to explore the relationship between the different motivation regulations proposed by organismic integration theory within self-determination theory and the presence of social physique anxiety along with the effects both of these have on translation of young adults' intentions to exercise behaviour. Thus, this study helped clarify some of the questions in regards to the gap between behaviour and intention when taking into consideration social physique anxiety and motivation regulation differences. Participants were 110 young adults, both men and women from the ages of 18-35. Of the 110 participants, only 28 were men; therefore, men and women were not examined separately. Two surveys were conducted online one week apart from one another. Most of the hypotheses were partially supported by the model with significant findings in motivation regulations. As predicted, individuals with more autonomous form of motivations were more likely to have intentions to exercise and to follow through with those intentions. Individuals with more external regulations were less likely to have intentions to exercise and less likely to follow through with

intentions. However, social physique anxiety was not related to the translation of intention to exercise behaviour. In conclusion, the intention-behaviour gap and the role of motivational regulations are important to consider when investigating exercise behaviours. If this gap is to be diminished, interventions will need to be developed to increase people's autonomous regulations and less focus should be given to motivating people with external rewards.

Preface

This thesis is original work by Izabela Figueiredo. Ethics approval was obtained through the University of Alberta Research Ethics Board, Pro00094752, November 5, 2019.

Acknowledgement

Thank you to my supervisor and mentor; Tanya Berry for her ongoing support throughout this program; her guidance, kindness and superb knowledge in my area of studies has helped me learn and succeed both personally and academically. I could not have asked for a better mentor through my academic journey. I would also like to thank Tara-Leigh McHugh for her ongoing knowledgeable advice in the last two years. I am grateful to have had the support of my lab-mates Maxine Myer and Kimberly Curtin, and others in the KSR graduate program. I am also forever grateful for my dear friend Tamara, and all those who have helped me through this journey in my graduate studies. Finally, I am especially thankful for my family, my fiancé Beal, my mom Cristina, dad Antonio (in memory), brother and sister in law for their patience, support and continued encouragement and motivation through my academic pursuits.

Table of Contents

Chapter 1. Introduction ***1***
Overview **1**
Physical activity/Exercise **2**
Social Physique Anxiety **3**
Self-Determination Theory **7**
Intention-Behaviour Gap **10**
Literature review **13**
Purpose statement **18**
Chapter 2: Methods/Procedure ***19***
Participants **19**
Procedure **20**
Demographics 21
Social Physique Anxiety Scale (SPAS) 22
Motivation (OIT) 23
Decisional Intention 24
Exercise Behaviour 24
Chapter 3: Results ***25***
Analysis **25**
Findings **27**
Table 1 27
Table 2 28
Table 3 30
Table 4 32
Table 5 36
Chapter 4: Discussion ***37***
Discussion of Research Study **37**
Limitations **51**
Concluding statement **52**
References ***53***
Appendix ***57***
Appendices A: Recruitment sheet **57**
Appendices C: Questionnaires **60**

List of Tables

1. Table 1. Participant demographic characteristics
2. Table 2. Means and standard deviations of SPAS and the behavioural regulations by intention group
3. Table 3. Variable Correlations and Means/SD between SPA and behavioural regulations
4. Table 4. Multinomial Logistic regression - Main analysis for intention-behaviour gap
5. Table 5. Sample Descriptive using *t*-test for different categorical variables

Chapter 1. Introduction

Overview

Intention to engage in physical activity is extremely important in people's motives to perform physical activity behaviour (Chu et al., 2008). There are many health benefits related to participating in physical activity (PA), including physical and mental health (Gilmour, 2007). Despite these benefits, the majority of North Americans fail to participate in sufficient physical activity (Statistics Canada, 2019). Furthermore, over the past few decades, physical activity for Canadians has decreased, regardless of the known positive health benefits of physical activity (Tremblay et al., 2011). In 2011, The Canadian Physical Activity Guidelines recommended that adults between the ages of 18-64 should accumulate at least 150 minutes of moderate to vigorous-intensity aerobic physical activity per week in bouts of 10 minutes or more. Muscle and bone strengthening activity is also recommended at least two days per week in order to achieve health benefits. The more active the individual is, the greater the health benefits (Tremblay et al., 2011).

Given the increased rate of inactive individuals, it is crucial that there is research focusing on the factors that will increase motivation towards adopting and maintaining an active lifestyle. It is also crucial that there is research focusing on understanding factors that may be related to lower physical activity behaviour. A number of constructs are known to have a relationship with participation in physical activity (PA), including social physique anxiety (SPA) (Brunet & Sabiston, 2009). SPA is characterized by a worry or concern that others may be judging their physical appearance negatively (Hart et al.,1989). Furthermore, individuals may also feel pressure from society's ideals about their body physique (Brunet & Sabiston, 2009).

A combination of SPA and motivational constructs from self-determination theory (SDT) are important when trying to understand exercise behaviours. SDT is a theory of motivation that differentiates between types of motivation for predicting outcomes of health and wellbeing (Deci & Ryan, 2008). To understand why and how people engage in exercise, a few different behaviour models have been studied. The behavioural intention model, in particular, has provided good direction for further research because it aims to predict behaviour by analysing attitudes and subjective norms that affect people's intentions and behaviours. A great challenge identified in behavioural intention research is whether or not intention translates into behaviour when other variables are present. This challenge is known as the intention-behaviour gap. The current study focused on different types of motivation regulations and how the effects of SPA impact both exercise behaviour and the gap between intention to exercise and exercise behaviour.

Physical activity/Exercise

Physical activity and exercise are distinct terminologies used in today's literature to evaluate different aspects of physical activity behaviour (Caspersen et al., 1985). Physical activity is defined as "bodily movements produced by skeletal muscles that result in energy expenditure" (Caspersen et al., 1985, p. 126). Physical activity is categorized as identified actions and doings that occur in one's life throughout the day (e.g. cleaning the house). Leisure time physical activity can be further subdivided as sports, conditioning exercise, or household tasks. Similarly, physical activity can be further divided into light, moderate, or heavy intensity; activities that are willful or compulsory; or, those that are weekday or weekend activities (Caspersen et al., 1985). Exercise has been used interchangeably with physical activity since they

both have common characteristics. They both involve movements of the skeletal muscles that expend energy; are measured in kilocalories ranging from low to high; and, are positively correlated with physical fitness in regards to duration, frequency, and intensity of exertion. However, exercise is a subcategory of physical activity and is defined as "a physical activity that is planned, structured, repetitive, and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective" (Caspersen et al., 1985, p 128). Exercise can be in the form of weightlifting, running, swimming, cycling, and so on. For the purpose of this study, exercise as a subtype of physical activity was used, as it is a more focused, narrow idea of physical activity.

Social Physique Anxiety

There are a number of constructs related to exercise that can be used to understand exercise behaviour. The main ideas used in this study are SPA and motivational constructs from self-determination theory. Exercise tends to have a lot of emphasis on evaluations of the body. Thus, these activities elicit a variety of positive and negative emotions (Sabiston et al., 2014). Constructs such as body image have, therefore, been studied and have received considerable attention as important factors related to physical activity and sport behaviour (Sabiston et al., 2019). Body image is defined as a multidimensional construct that focuses on the body's appearance and function (Cash & Smolak, 2011). People's *perceptual dimensions* are how one sees their own body appearance and function, and people's *cognitive dimensions* are when people assess thoughts of their body appearance and function. The *affective dimension* is focused on the individual's feelings and emotions about their appearance and function, and the *behavioural dimension* focuses on assessing one's behaviour resulting from perception, thought,

and feelings about body appearance and function (Cash & Smolak, 2011). In terms of sport and exercise psychology, body image is important as it acts as an antecedent and consequence of physical activity behaviour as different aspects of one's body image may implicate or facilitate the engagement of physical activity (Sabiston et al., 2019). Social Physique Anxiety (SPA) is a construct within body image. It is a commonly studied emotion that may influence someone's relationship with physical activity (PA) behaviours (Hart et al., 1989). SPA is defined by worry that an individual may feel about how others may be judging their physique (Hart et al., 1989). It is often studied as one aspect of the *affective dimension* within the body image construct (Hart et al., 1989). It may be further characterized by a desire to control the appearance of the body to avoid the guilt that may be caused by possible social disapproval (Crawford & Eklund, 1994). Thus, SPA adds to the relationship between the self and the body since it includes feelings about their perceptions of their own body (Crawford & Eklund, 1994). Feelings about people's perceptions of the body are described in self-presentation theory, where individuals are motivated to make good impressions on others for social and material gains (Schlenker & Leary, 1982). Self-presentation theory is a goal-directed attempt to control how the self is perceived by others and the relationship between an individual's motivation to make a desirable impression and perceived ability to attain these impressions (Schlenker & Leary, 1982). These desirable impressions are usually motivated by characteristics such as thin, toned shapes for women and muscular, toned physiques for men which are perceived as attractive appearances and physical characteristics within today's society (Sabiston et al., 2014). When these wanted physiques of desired body size and appearance are not attainable or perceived to be attainable, this may lead to increased SPA (Sabiston et al., 2014). SPA is often used as a representation of self-presentational processes or body image affect (Sabiston et al., 2014). Thus, based on self-presentation

perspectives, individuals may choose to either engage in or avoid PA in order to increase their chances of making positive, desirable impressions on others; or, individuals may avoid PA as their physique could potentially be evaluated negatively by others in exercise or sport settings (Sabiston et al., 2014).

There is evidence that SPA has state-like properties and demonstrates features in physical environments and interpersonal and intrapersonal contexts (Sabiston et al., 2014). Researchers have found that physical environments where a person who is working out feels that their body may be on display and evaluated (e.g. fitness center) or where a person is working out in front of a mirror increases SPA experiences compared to more private settings (Van Raalte et al., 2004). In an interpersonal context, researchers have also found that older teenagers who were accompanied by peers while exercising versus those that were accompanied by their parents reported higher SPA (Brunet & Sabiston, 2011). Moreover, other studies have also found that in a hypothetical scenario, women who attend fitness clubs report higher SPA in all-men exercise environments than in mixed-sex or only women settings (Kruisselbrink et al., 2004). There is some evidence that supports the idea that SPA is present most strongly among young and middle aged adults when compared to older adults; however, there are a few other studies that have found no association between age and SPA (Sabiston et al., 2014). Thus, the present research focused on young adults between the ages of 18-35 as the age group for this current study because people within this age category seem to be vulnerable to SPA. Additionally, another possible predictor of SPA that has been researched is gender. Sabiston (2014), addresses the consistent evidence that women have higher SPA than men, but how this does not protect men from experiencing SPA.

Gender, being a socialized concept that allows individuals to have expression of different identities could bring more challenges towards SPA. In today's society we can notice that men and women have been socially constructed to have certain body characteristics that individuals may feel need to be achieved in order to be more masculine or feminine, which in turn, could potentially increase the risk of developing SPA. Gender influences how people perceive themselves and each other, how they act and interact (Canadian institute of Health research, 2020). That being said, it is crucial to research gender differences as different gender ideals appear to be impacted by body ideals. Thus, for the current research, both men and women were included, as men may also experience SPA emotions and should not be disregarded.

Additionally, there are many other social triggers that appear to predict more or less SPA: peer group influences; encouragement or discouragement from friends, family, and others on body physique; and/or, personal identification as being more or less attractive than peers. However, for this study it was not feasible to individually measure all social triggers that could predict SPA. Consequently, there was a general focus on SPA levels that were evaluated, as opposed to measuring the triggers separately. Interpersonal sources that may increase SPA may include indirect parental commentary and controlling actions (e.g. controlling diet); the opinions of authority figures such as coaches, teachers, and fitness leaders; and, the influence of mass media messages (Sabiston et al., 2007). A review article by Sabiston (2014) states that electronic and print media can put pressure on individuals and has been an increasing source of SPA triggers. Thus, exposure to model-focused athletes, social media, and advertisement can create pressure on body physique and attractiveness which has a huge influence on increased SPA (Sabiston et al., 2014). Given the numerous possible triggers, SPA is a very important construct to consider when researching exercise.

SPA experiences also have a range of outcomes that are outside the scope of this paper, ranging from eating disorders, to commitment to PA, to mental health issues (Sabiston et al., 2014). However, Sabiston (2014) identified ambiguity in the understanding of whether higher SPA scores are related to participation or avoidance of PA. The failure, or perceived failure, to live up to society's physique "standards" may bring thoughts and feelings that others are negatively evaluating one's physique which in turn may produce emotions of SPA. In particular, those who feel societal pressure towards their physique may feel concerned about others judging them negatively and may increase or decrease their physical activity in order to manage their feelings towards their physique (Brunet & Sabiston, 2009). Therefore, SPA should continue to be studied in detail so that interventions can be developed to lower SPA. Accordingly, the aim of this research was to understand SPA and its relationship with exercise behaviour, as the pressure individuals feel to portray ideal physique are brought on by society and social forces in today's communities.

Self-Determination Theory

When trying to understand intention and exercise behaviour, it is important to look at people's motivation towards exercise, as this can help distinguish how to engage people in a more physically active lifestyle. Motivation is the energy, direction, persistence, activation, and intention a person has towards a behaviour (Ryan & Deci, 2000). People can be motivated because they value an activity or because there is a strong external force, such as a bribe (Ryan & Deci, 2000). Motives in a PA setting, such as in exercise, vary between individuals. For those individuals that feel strong SPA emotions, SPA can influence the motivation to exercise or demotivate individuals towards exercise, as they may feel judged when performing exercise behaviour (Portman et al., 2018).

Self-determination theory (SDT) is a theoretical framework that includes many aspects of motivation and may be a useful theory to analyze the relationship between people's motivation to exercise and their future intention to exercise (Sicilia et al., 2016). SDT is a theory of motivation that focuses on the types and quality of motivation as opposed to the total amount of motivation for predicting outcomes of health and wellbeing (Deci & Ryan, 2008). Autonomous and controlled motivation are the two central distinctions within SDT. Deci and Ryan (2008) define the motivational constructs as: Autonomous motivation being when the motives of an individual are driven by intrinsic forces. Intrinsic motivations being those that people have classified as internally valued activities that are integrated into their sense of self. Additionally, controlled motivation includes both external regulations and introjected regulations. External regulations, which are driven by extrinsic motivation, include those that are driven by outside sources such as bribes, rewards, and/or punishments. Introjected regulations, where actions are partially internalized, are motivated by factors such as avoiding shame, approval motivation, self-esteem, and ego-involvement. Both controlled and autonomous motivation vitalizes the direction of a behaviour and contrasts with amotivation, which is the lack of intention and inspiration (Deci & Ryan, 2008). Research suggests that autonomous motivation is superior for performance and long-term persistence of a behaviour and is also better for psychological health (Deci & Ryan, 2008). Research has also shown that having extrinsic exercise goals could hinder the exercise participation levels of individuals which supports the need to further understand motivation and exercise behaviour (Sicilia et al., 2016). These findings are critical and significant for this study as this may contribute to the understanding of developing intentions to be physically active and then translating intention to behaviour more or less frequently.

SDT has several sub-theories. Organismic Integration Theory (OIT) describes the degree of internalization accompanying extrinsically motivated behaviour and stipulates that the quality of extrinsic motivation varies from highly controlled to volitionally endorsed (self-determined). Both controlling and self-determined motives contribute to behaviour regulations (Deci & Ryan, 2008); however, it is seen that more self-determined reasons for performing a behaviour are linked to more sustained and more authentic mental health than a more extrinsically driven behaviour (Deci & Ryan, 2008). OIT positions that at the far left of the SDT continuum is amotivation: the state of lacking the intention to act. It proposes that people will not act at all or will but without intent. On the opposite side of amotivation in the continuum, intrinsic motivation is found: the state in which people experience pleasure performing a behaviour and are inherently satisfied with performing the behaviour. It is highly autonomous and is recognized as a self-determined behaviour (Ryan & Deci, 2000).

Extrinsically motivated behaviours cover the continuum from amotivation to intrinsic motivation with different levels of extrinsic motivation being the different extent of which their regulation is autonomous to a behaviour. The extrinsically motivated behaviours that are least autonomous are referred to as external regulations. Externally regulated behaviours are usually the ones that are done to satisfy a demand or are driven by reward. They are perceived as controlled forms of motivation (Ryan & Deci, 2000). The second type of extrinsically motivated behaviour is called introjected regulation. This motivation is relatively controlled as behaviours are performed to avoid guilt or anxiety or to attain an ego enhancement (i.e. pride) where people are motivated to demonstrate ability (Ryan & Deci, 2000). The third type of extrinsically motivated behaviour is more autonomous in nature and is known as identified regulation. This type of motivation reflects the person's valuing of a behaviour – the action is seen as personally

important and the behaviour is done because it is valued. Finally, the most autonomous type of extrinsically motivated behaviour, integrated regulation, is when the behaviour is integrated into the person's lifestyle and brings harmony with other structures, values, and needs within the self. Integration happens when identified regulations are fully assimilated in the self and are equivalent to the self's values and needs. When people's internalized regulations are incorporated into the self, individuals experience greater autonomy in their action (Ryan & Deci, 2000). Thus, we can speculate that individuals who have more autonomous forms of motivation, will have greater intentions to exercise and will more likely follow through with their behaviour.

Intention-Behaviour Gap

Overall, from the motivational aspects within SDT we can see some links to intention and exercise enactment based on different types of motivation. However, some problems present themselves with this intention-behaviour relationship which has generated the term "intention-behaviour gap" (Rhodes & Bruijn, 2013). This refers to situations whereby not everyone who has the intention to do a behaviour will follow through with the action they intended to do (Rhodes & Bruijn, 2013). It is also possible that SPA is related to the intention-behaviour gap.

Rhodes and Rebar (2017) define and measure intention using two themes: decisional intention and the degree of intention. Decisional intention measures the direction of intention and highlights its dichotomous nature. In other words, an individual can have the intention to exercise or not (Rhodes & Rebar, 2017). The degree of intention measures the intensity of intention. In other words, how much intention does the person have towards a behaviour measured in a scale. The current study used decisional intention as both a definition and a measure of intention. When studying intention versus behaviour, we must take into account the intention-behaviour gap. Why is it that some people have the intention to exercise and do, but

others have the intention to exercise and do not? Many researchers have found correlations that indicate intentions are related to behaviour. There have been numerous findings that indicate that forming an intention to change is vital if people are to initiate a new behaviour or are planning to make behaviour changes (Sheeran & Webb, 2016). However, recently there have been other studies that conclude that having intentions does not signify behaviour change. A way of understanding intention can be explained by the action control framework that is described as the "intention-behaviour gap." In the action control framework, intentions and behaviours that follow are divided into quadrants (Rhodes & Bruijn, 2013). These quadrants are: non-intenders (those who have no intention to be active and are not active); successful intenders (those who have positive intentions and successfully become active); non-intenders exceeding intentions or successful non-intenders (those who have no intentions and are successful actors regardless of their negative intentions); and, unsuccessful intenders (those who are unsuccessful actors on their positive intention to become active). Rhodes and Bruijn (2013) found that non-intenders who subsequently did not engage in PA represented 21% of participants, and non-intenders who subsequently performed PA represented 2%. However, intenders who did not follow through with PA behaviour represented 36% of the sample, showing that it is this group that is primarily responsible for the intention-behaviour gap (Sheeran & Webb, 2016). This demonstrates that intention is an important component of PA behaviour and further suggests that intention is important but not necessary for people to achieve PA enactment (Rhodes & Bruijn, 2013).

There are a few influences that effect intentions and whether intentions will be translated into behaviour. There is some evidence that intentions developed from personal beliefs are a better predictor of behaviour than those intentions that are based on social pressure, such as norms (Sheeran & Orbell, 1999). This is in line with SDT, as SDT states that behaviours that

arise from a more autonomous motivation are more likely to be sustained than those behaviours that arise from controlled, extrinsic motivations. These ideas are related to attitudes, as attitudes are made of cognitive and emotional feelings towards a behaviour. These feelings are a self-perception of the behaviour which would be congruent to their perception of themselves. Hence, intentions that are based on feelings about performing a behaviour (affective attitudes) rather than those on thoughts about the consequences of acting (cognitive attitudes) are associated with improved predictions of behaviour (Sheeran & Webb, 2016). Similarly to the ideas proposed by OIT, intentions that are more relevant to a person's identity will likely increase the probability that the intentions will be realized. Thus, someone who perceives themselves to have an exercise identity or has identified motivation towards exercise (one who loves exercising and sees this a part of their identity) is more likely to follow through with their intention to exercise more frequently than someone who does not see exercising as part of their identity developing more self-determined motivations towards exercise (Sheeran & Webb, 2016).

The controlled versus autonomous distinctions on motivation that the OIT theory addresses are important to consider when studying the intention-behaviour gap because intention and motivation have very similar characteristics when it comes to the likelihood of behavioural change (Chatzisarantis et al., 1997). Firstly, autonomous intentional motivation is associated with devotion to behavioural task, whereas controlled intentional motivation is associated with dropping out (Chatzisarantis et al., 1997). Thus, factors that are autonomous and form the basis of the intention influence rates of intention realization accurately because they lead to stable intentions that have more powerful effects (Sheeran & Webb, 2016). Accordingly, since the basis of intentions have properties that are aligned with the OIT motivation continuum, we can be confident that those motivations found on the OIT continuum can better predict the translation to

exercise behaviour when taking into consideration the intention-behaviour gap model (Chatzisarantis et al., 1997). In summary, different types of motivation towards exercise, such as those found on the OIT continuum, suggest that motivation impacts intention-translation. Thus, we can speculate that intentions that are accompanied by autonomous forms of motivation would be able to translate intention into behaviour more frequently than a more controlled form of motivation towards exercise.

Literature review

To date, few studies have examined the combined role of SPA and motivation as factors that explain exercise behaviour. Given the focus of the current study, reviewing the research that has considered the role of SPA and motivation to help explain exercise behaviour is crucial. Ryan and Deci (2000) proposed that controlling factors, such as how people feel or perceive a behaviour, indirectly influence motivation. This has led researchers to examine the relationship between SPA and voluntary exercise with the motivational sequence proposed by SDT. Sicilia (2016) developed a study that analyzed the relationship between SPA and intention to be physically active in adolescents while also looking at the mediating effects of basic psychological needs (autonomy, competence, relatedness) on behaviour regulation in exercise. Participants completed a self-administered questionnaire during their physical education class that assessed SPA, basic psychological needs, behavioural regulation in exercise, and intention to be physically active. The results indicated that SPA negatively predicted intention to be physically active through mediation of basic psychological needs and the three autonomous forms of motivation (intrinsic motivation, integrated motivation, and identified regulation). The model indicated that basic psychological needs totally mediated the effects of SPA on intrinsic motivation (through all three needs), integrated regulation (through the needs of autonomy and

competence), and amotivation (through the need for relatedness). Autonomous forms of motivation (intrinsic, integrated, and identified regulations) positively predicted future intentions to exercise and neither of the controlling forms of motivation predicted intention to exercise (Sicilia et al., 2016). The concluding argument for this study indicated that SPA indirectly predicts motivational regulations and the intention to be physically active. As hypothesized, SPA negatively predicted satisfaction of the needs for autonomy, competence, and relatedness. This makes sense as feelings that others are negatively judging one's body would probably lower feelings of competence, relation to others, and perceived autonomy (Sicilia et al., 2016). Thus, based on the outcomes of this study it can be predicted that SPA may have a negative relationship with exercise behaviour, and motivational constructs may have a positive relationship with exercise behaviour. However, the two variables together (SPA + autonomous motivation) may have the strongest effect on intention-behaviour translation. Similarly, SPA and extrinsic motivation may have the strongest effect on the intention-behaviour gap (intention when no action is made). The study by Sicilia (2016) explains the relationships between SPA, motivation, and the intention to be physically active. Similarly, the current study used SPA and constructs within SDT to try to explain any intention-behaviour gaps. However, the study by Sicilia (2016) does not investigate if the intentions that were observed were converted into action. The current study took this into account by following up with participants to see if their intentions were, in fact, translated into action.

Another interesting study on the relationship between SPA, SDT, and physical activity was completed by Brunet and Sabiston (2009). They looked at the motivational sequence proposed by SDT and investigated the relationship between SPA, basic psychological needs, motivation, and behaviour within the physical activity domain. Three hundred and eighty-one

individuals between the ages of 17-23 from schools in Montreal, Canada, participated in the study. The study demonstrated a model that supported the idea that SPA directly influenced need satisfaction and indirectly influenced physical activity motivation and behaviour. The hypothesis that SPA would be negatively correlated to perceived competence, autonomy, and relatedness was supported and in line with other SDT research which upholds the idea that SPA is a controlling factor that obstructs need satisfaction. Moreover, controlling influences such as SPA are likely to prevent need satisfaction, which would further lower levels of self-determined motivation and could influence an individual's motivation for physical activity behaviours (Brunet & Sabiston, 2009). Lastly, they also found that motivation was a significant positive correlate to leisure physical activity behaviour. Finally, the study suggests that SPA is a controlling factor that has extensive effects on perceptions of competence, autonomy, and relatedness which could be detrimental to the motivation of physical activity behaviour (Brunet & Sabiston, 2009). Hence, we can speculate that those who have high SPA may have decreased intentions to exercise and would be less likely to translate their intention to exercise into action. Additionally, if those with high SPA have higher levels of extrinsic motivation this may also hinder the probability that their intention to exercise will be translated into exercise behaviour as there is evidence, as previously mentioned, that extrinsically motivated actions are less likely than autonomous motivated actions to be translated into behaviour.

For the purpose of the current study, investigating the role that SPA plays in intention and exercise translation and the interaction of motivation regulations is worthwhile so that more accurate predictions of behaviour can be considered. Portman (2018) looked at SPA and its relationship between physical activity frequency, history of exercise, and physical activity intensity in regularly active men and women exercisers. SPA is said to be a deterrent for

individuals to perform physical activity behaviours because certain individuals are nervous about displaying their physique in a physical context due to fear of negative judgement (Portman et al., 2018). It is also said that some individuals with high SPA may be motivated to exercise more frequently in an attempt to improve the appearance of their physique and also reduce the possibility of experiencing future body-related anxiety. The aim of the study by Portman (2018) was to see if higher SPA was associated with opting for a particular training method in the form of higher or lower frequency, duration, and intensity of physical activity sessions. They predicted that there would be significant associations between SPA and PA behaviour in terms of frequency, gym membership duration, and intensity. However, this cross-sectional study found no relationship between SPA and PA frequency, length, and intensity for the whole sample (Portman et al., 2018). That study adds to the notion that individuals with high body-related anxiety are not definitively deterred from performing regular physical activity. Other research has also looked at SPA and PA frequency, length, and intensity and found no relationship between them (Portman et al., 2018). This could be due to the fact that these studies did not take into consideration the types of motivation that individuals have for these exercise behaviours. It would be interesting to explore if individuals with high or low SPA had more controlled or autonomous forms of motivation and how that affected their intention to exercise. For the present study, the effects of SPA on intention and intention-behaviour translation will be taken into account to have a better understanding of why there appears to be no relationship between SPA and PA.

Furthermore, Lantz and Hardy's (1997) study observed SPA similarly to the previous study mentioned, where the relationship between SPA and exercise behaviour was taken into

account. Their study also had a focus on the moderating effects of gender, age, and depression in the SPA and exercise behaviour relationship. Their study included 120 men and 180 women ranging from 18-60 years. Participants were required to answer the Social Physique Anxiety Scale questionnaire (SPAS), Beck Depression Inventory (BDI), and the Minnesota Heart Health program Leisure Time Physical Activity Questionnaire (MHHP). Results indicated that there was a significant negative relationship between SPAS scores and MHHP scores and that this relationship was moderated by gender, age, and depression (Lantz & Hardy, 1997). They found that individuals with higher levels of SPA may be less likely to engage in physical exercise in situations where their bodies may be evaluated negatively. Self-presentation may prevent individuals from participating in exercise behaviours due to their perceived negative notion of their own bodies or their anxiety towards being judged negatively by others in an exercise setting (Lantz & Hardy, 1997). Further, the study also showed that this prediction was supported with the inclusion of gender and age as moderators (Lantz & Hardy, 1997). Thus, it can be speculated based on this finding that individuals with high SPA may or may not have the intention to exercise but will be less likely to follow through with the behaviour creating a negative relationship between SPA and exercise behaviour.

Interestingly, Crawford and Eklund (1994) investigated how SPA may be associated with exercise behaviours but only had participants of college-age women, which is a population limitation. However, in contrast with the other studies, they hypothesized that SPA would not be associated with frequency and duration of women's exercise. They also predicted that SPA would be associated with self-presentation motives for exercise but not related to motives for exercise that were independent of self-presentation. They used questionnaires similar to other studies discussed. They concluded that there were no associations between self-presentation and

frequency or duration of exercise and that SPA does not influence exercise unless it is through the influence of situational factors related to showing off an individual's physique (e.g. clothing, exercise setting, etc.). Further research should replicate this study with more participants using a longitudinal study to measure if there would be a relationship in different points of time as a cross-sectional study cannot be used to analyze behaviour over time. Measures of frequency and duration using self-report surveys should be considered cautiously as they are often flawed due to misleading retrieval or inaccuracy of memory (Crawford & Eklund, 1994).

Frederick and Morrison (1996) looked at adherence to exercise behaviours, participation motivation, and emotional attitudes towards exercise. 326 Participants from different university fitness centers were surveyed. Their study demonstrated that those with higher SPA scores showed higher devotion to exercise than those who scored lower on SPA. However, they also reported that those with higher SPA scores reported higher extrinsic motivation than those with low scores. Thus, this study supports the notion that individuals who have higher SPA scores are overly concerned with body appearance and may exercise solely to attain a more desirable body (Frederick & Morrison, 1996). However, their intention to exercise may not have been translated into action if their intention to exercise was motivated solely by extrinsic factors. The participants may not have continued their participation long term, so a longitudinal study would need to be conducted to see if this devotion to exercise was translated into action and if it was continued for a period of time.

Purpose statement

The studies reviewed demonstrate some links between SPA, OIT, exercise intention, and exercise behaviour that are worth further investigating. That being said, due to conflicting and inconclusive results, more research is needed to understand the relationship between SPA, types

of motivation regulations, and the intention-behaviour gap. Accordingly, the main purpose of this study was to explore the relationship between the different motivation regulations proposed by OIT and the presence of SPA along with the effects both of these have on translation of young adults' intentions to exercise behaviour. This study will help clarify some of the questions in regards to the gap between behaviour and intention when taking into consideration SPA and motivation regulation differences. Therefore, based on the theoretical assumptions and empirical findings explored in the literature review, the current study explored the following predictions using the intention-behaviour gap quadrant as a model for exploration:

Hypothesis 1: Successful intenders will have higher autonomous motivation to exercise and lower SPA in comparison to the other intention groups.

Hypothesis 2: Unsuccessful intenders will also have high autonomous motivation to exercise but will have higher SPA in comparison to successful intenders.

Hypothesis 3: Successful non-intenders (those who have no intention to exercise but exercise) will have lower autonomous motivation in comparison to successful intenders but will also have low SPA.

Hypothesis 4: Non-intenders (those with no intention to exercise and do not exercise) will have lower autonomous motivation and higher SPA in comparison to successful intenders.

Chapter 2: Methods/Procedure

Participants

Men and women were recruited for this study, with a total of 124 participants. A power analysis using G*power 3.1 indicated that the necessary N for a power of .80 at an alpha of .05,

is a sample size (N) of 104 participants that would be needed in order to conduct a statistical analysis with meaningful results.

Procedure

Approval from the University of Alberta's ethical review board was obtained before the commencement of this study. Participants were between the ages of 18-35 years. Questionnaires were completed online through Research Electronic Data Capture (RedCap), a secure online server that is used to manage surveys and databases and is commonly used for research studies in universities (University of Alberta; RedCap, 2020). After being provided information about the study, consent to participate was indicated by clicking the Redcap link and starting the survey. Data collection occurred during two phases. During the first phase, participants completed survey measures of motivation, SPA, intention, and regular exercise behaviour. Their demographic information (i.e., gender, age, weight, and height) was also collected. Intention to perform exercise behaviour was measured using a single question "Do you intend to exercise for at least 150 minutes in the next week (7-day period)?" Motivational regulations from OIT was measured using the Behavioural Regulation in Exercise Questionnaire (BREQ- 2) (Mullan et al., 1997). SPA levels were measured using Social Physique Anxiety Scale (SPAS; Martin et al., 1997). Regular exercise behaviour pre-test was measured using the Leisure-Time Exercise Questionnaire (LTEQ) (Godin & Shephard, 1985). During phase two, an exercise behaviour question to determine if intention was translated into exercise was given, along with a question asking the location of exercise performance. Participants were recruited through a series of social media platforms, such as Instagram and Facebook, as well as *The Student Digest* through the University of Alberta. Participants who were interested emailed the principal investigator

expressing interest and an information email reply with the consent form and a link to the questionnaire was sent. Participants were notified that there were two phases to this study and that they were to complete the following questionnaires in the first phase. A week later, they received another email with the second questionnaire that verified how much exercise they had done in the previous week and where the exercise activity took place. Although online administration can be concerning as researchers are not present with the participants to control for variables that may cause problems, such as not understanding the question or completing the questionnaire incorrectly, online administration allows for the ability to gather more participants than required and has easier administration. Additionally, participants were more likely to participate since the questionnaires were done in the comfort of their own home, which made for easier recruitment. For the present study, the recruitment was done between the end of November to the middle of December. All the steps and efforts towards administering a safe and ethical online questionnaire study were completed.

Measures

A series of questionnaires were used to measure exercise intention, motivation, SPA, and exercise behaviour. Recruitment information is in appendix A, the information letter is in appendix B and all questionnaires are in appendix C.

Demographics

Participants were asked to report their age, gender, height, and weight. The age was asked as participants were required to be between the age of 18-35 to meet the requirement to participate. A young adult population is an important age group as studies show that people in younger age groups experiences more SPA because they are more concerned about how others

view their body physique than an older population (Sicilia et al., 2016). Furthermore, gender was also an area of interest for this study because there is some research that proposes that SPA is more prominent in women than men. Sabiston (2014), addresses the consistent evidence that women have higher SPA than men, but this does not protect men from experiencing SPA. Thus, for this research, both men and women were included, as men may also experience SPA emotions and should not be disregarded. Additionally, height and weight were used to calculate BMI. BMI was used to evaluate additional information for the current study, such as, if difference in BMI scores played a role in exercise behaviour and other variables (Page & Fox 1977; Crocker et al., 2003). Participants were also asked to report if they were an active fitness center member, how long they had been an active fitness center member, and how many times they use a fitness center in a typical week. This information was collected for additional information purposes as some research states that SPA has some associations between fitness center membership and exercise frequency. This is because individuals with higher SPA may be more body conscious in front of others or around mirrors which could affect their attendance frequency to fitness centers (Portman et al., 2018; Hart et al.,1989). Researchers have also found that physical environments, such as fitness centers, might make a person feel that their body may be on display and evaluated or that when a person is working out in front of a mirror it might increase SPA experiences compared to more private settings (Van Raalte et al., 2004). For these reasons, fitness center information was collected.

Social Physique Anxiety Scale (SPAS)

SPAS is a 9-item questionnaire used to measure the degree of anxiety an individual has in relation to how that individual feels others are observing and judging their body, either positively

or negatively. All participants indicated the degree that each item corresponds to themselves on a Likert scale ranging from 1 (Not at all) to 5 (Extremely). High scores on the SPAS suggest anxiety and concern in relation to the perceived negative evaluation of one's physique by others (Martin et al., 1997). Martin (1997) provided the 9-item unidimensional scale because three of the items in the 12-item scale correlated with body-dissatisfaction and appeared to be weak. Therefore, all three items were removed from the original scale. In the nine-item scale, participants were presented with a series of statements and asked to respond according to how well that statement fits their interpersonal body-image beliefs. Participants responded to items such as "There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively," and "In the presence of others, I feel apprehensive about my physique/figure," and "I wish I wasn't so uptight about my physique/figure." Some items were reversed scored before summing. Individual item scores were totalled to provide a total score for SPA: scores can range from 9 to 45, with a higher score indicating greater SPA. The 9-item SPAS scale has been found to have high validity and reliability (Martin et al., 1997).

Motivation (OIT)

To assess the OIT of motivation spectrum, the Behavioural Regulation in Exercise Questionnaire-2 was used (BREQ-2; Markland & Tobin, 2004). The BREQ-2 is a 19-item questionnaire used to measure amotivation, external, introjected, identified, and intrinsic motivation. It is a questionnaire that was created to analyze the relationship between behavioural regulations and psychological constructs in relation to motivation. The responses are on a 5-point scale ranging from 1 = "Not true for me" to 5 = "Very true for me" (Markland & Tobin, 2004). The BREQ-2 includes four subscales of the original BREQ assessing external (4 items, e.g. "I exercise because others say I should") introjected (3 items, e.g. "I feel guilty when I don't

exercise"); identified (4 items, e.g. "I value the benefits of exercise") and intrinsic (4 items, e.g. "I exercise because it is fun'') (Markland & Tobin, 2004, p.193). Additionally, amotivation was added to this scale with 4 items from (Mullan et al., 1997) including items such as: " I don't see why I should exercise", "I can't see why I should bother exercising", "I don't see the point in exercising", and "I think that exercising is a waste of time" (Mullan et al., 1997). Overall the BREQ-2 is shown to be a valid and reliable source of questionnaire to measure types of motivation towards exercise for a young adult population (D' Abundo et al., 2014).

Decisional Intention

This study used questions that assess decisional intention which measures direction of intention. To assess this, the following statement was provided: "Next week, I intend to exercise for at least 150 minutes." The response was captured using a Yes/No scale as a dichotomous measurement of intention direction (Rhodes & Rebar, 2017).

Exercise Behaviour

The Leisure Time Exercise Questionnaire (pre-test) (LTEQ; Godin & Shephard, 1985) was used to assess regular exercise behaviour during a 7-day period (a week). This questionnaire is valid, reliable, and easy to complete (Godin & Shephard, 1985). The LTEQ categorises people into several activity categories, which is helpful when assessing their exercise behaviour (Godin & Shephard, 1985). The category "mild intensity" included in the questionnaire was excluded as it does not contribute to health benefits (Godin, 2011). Thus, reported strenuous and moderate activity was used for the purpose of this research. The questionnaire asks participants to indicate how many times, on average, in a 7-day period they perform moderate or strenuous exercises for more than 15 minutes during their free time. Strenuous activity includes: running, jogging,

football soccer, squash, basketball, cross country, judo, roller blading, vigorous swimming, and vigorous distance cycling. Moderate activity includes: fast walking, tennis, easy biking, volleyball, badminton, easy swimming, alpine skiing, and popular folk dancing. Mild exercise activity includes: yoga, archery, fishing, bowling, horseshoeing, golf without a cart, snowmobiling, and easy walking (Godin & Shephard, 1985). The moderate-to-vigorous physical activity (MVPA) score was used for analysis. Overall, the scores from the questionnaire seems to give reliable and valid outcome to measure an individual's self-reported exercise behaviour (Godin & Shephard, 1985). During phase two, a two-question questionnaire was given to measure exercise behaviour (post-test) in the previous week asking "I have exercised at least 150 minutes during the past week" and "Did your exercise take place in a fitness center?" answered in a Yes/No nominal question. This question was included so that the location of the exercise could be further investigated to see if there was a correlation to SPA, as fitness centers may have a link to increased SPA.

Chapter 3: Results

Analysis

In order to evaluate contributions of demographics, SPA, motivation, intention on exercise behaviour and exercise behaviour (post-test), a bivariate correlation analysis and crosstabulation chi-square test were completed, along with a series of *t*-tests. The correlational analysis helped explain the strength of the relationship between SPA and motivation regulations, and the series of *t*-tests helped explain the relationship between other demographic variables. Crosstabulation chi-square tests were also completed to compare fitness membership, intention, and exercise behaviours (post-test). Firstly, a correlational analysis for SPAS and the different

subscales of the BREQ-2 was completed. Next, to test the main hypotheses, a multinomial logistic regression was used to predict group membership in the four quadrants from the intention-behaviour gap model. Multinomial logistic regression is a way to predict a nominal variable given one or multiple independent variables. Multinomial regression is considered an extension of binomial logistic regression which allows for more than two categories of dependent variables. In this case, we used multinomial regression to understand which category in the intention-behaviour gap quadrant model a participant belonged to based on levels of SPAS and BREQ-2 scores. Following the correlation analysis mentioned above, the six assumptions that needed to be met before conducting a multinomial logistic regression were checked. The following assumptions were met in the order stated. The dependent variables were in nominal groups of unsuccessful intenders, successful intenders, and non-intenders. The groups were compared to successful intenders. The independent variables were: SPAS and BREQ-2 subscales (which include amotivation, external regulation, introjected regulation, identified regulation, and intrinsic regulation). Independence of observations and dependent variables had mutually exclusive and exhaustive categories. Additionally, multicollinearity was assessed and was within acceptable limits in all models with all variance inflation factors (VIF) <3.00. Next, the linear relationship between continuous independent variables was revealed along with the logistic transformation of the dependent variable. Lastly, no outliers were displayed. Additionally, for further analyses, correlational analyses and several *t*-tests were performed. For the *t*-tests, a Bonferroni correction was made for a p-value of .006 in order to account for the potential of a type 1 error with the number of t-tests that were performed. Thus, the results only highlight those that are significant with the Bonferroni correction. As mentioned, a correlational analysis was completed for the relationship between SPA and BREQ subscales. Furthermore, several other

correlation analyses were done to check the relationship between age and SPA; SPA and fitness center workout, BMI, and MVPA; MVPA and SPA; and, BMI and SPA. Several *t*-tests were done to look for the relationships between gender and SPA; BMI and intention; BMI and exercise behaviour (post-test); BMI and fitness membership; SPA and intention; and, SPA and exercise behaviour (post-test). MVPA data was collected during the first week to gather individuals' regular exercise behaviour for moderate and strenuous activity, and exercise behaviour data was collected during the second week to check if those exercise behaviours from the first week were carried over to the second week. Additionally, a chi-square analysis was completed to check for the relationship between intention and exercise behaviour (post-test) as well as fitness membership and its relationship to intention and exercise behaviour (post-test). Lastly, a one-way anova analysis was used for descriptive purposes of the 3 independent variables groups: successful intenders, non-intenders, and unsuccessful intenders to compare means to the dependent variables: SPA and the motivational constructs in question.

Findings

Participants were 124 young adults between the ages 18-35. Of these, 117 completed all portions of the instruments. Of these 117, seven were removed from the analysis as they were classified as successful non-intenders, which only made up 1.7% of the data and, therefore, do not provide valuable statistical information. Thus, the data from 110 participants were used for the analyses. Demographic information is summarized in Table 1. Of the 110 participants, only 28 were men; therefore, men and women were not examined separately.

Table 1

Participant demographic characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	110	18	35	26.41	5.412
Gender	82 women				
	28 Men				
Weight Kg	110	40.91	127.27	67.04	13.95
Height Cm	110	152	195	168.45	8.55
BMI	110	15.01	37.38	23.51	3.77

In Table 2 we can see that nonintenders, successful intenders and unsuccessful intenders all had relatively moderate SPA scores. Additionally, participants also showed similar low scores for amotivation, and external regulations. Introjected regulation scores indicated similar higher scores for all the groups except nonintenders, who demonstrated lower mean scores for introjected regulation. Both identified and intrinsic regulations also presented higher mean scores, except for the nonintender groups in both behaviour regulations.

Table 2

Means and standard deviations of SPAS and the behavioural regulations by intention group

					95% Confidence Interval for Mean			
		N	Mean	Std. Deviation	Lower Bound	Upper Bound	Minimum	Maximum
SPAS	Nonintenders	26	2.8462	.78068	2.5308	3.1615	1.22	4.11

	Successful intenders	52	2.8077	.77078	2.5931	3.0223	1.22	4.56
	Unsuccessful intenders	32	2.8542	.96222	2.5072	3.2011	1.44	4.89
	Total	110	2.8303	.82556	2.6743	2.9863	1.22	4.89
Amotivation	Nonintenders	26	1.5000	.68920	1.2216	1.7784	1.00	3.00
	Successful intenders	52	1.1106	.31081	1.0240	1.1971	1.00	2.75
	Unsuccessful intenders	32	1.1094	.28354	1.0071	1.2116	1.00	2.00
	Total	110	1.2023	.45243	1.1168	1.2878	1.00	3.00
External	Nonintenders	26	1.9038	.80336	1.5794	2.2283	1.00	4.25
	Successful intenders	52	1.4087	.43732	1.2869	1.5304	1.00	2.50
	Unsuccessful intenders	32	1.4766	.59010	1.2638	1.6893	1.00	3.00
	Total	110	1.5455	.61441	1.4293	1.6616	1.00	4.25
Introjected	Nonintenders	26	2.6154	1.10631	2.1685	3.0622	1.00	5.00
	Successful intenders	52	3.3654	.92475	3.1079	3.6228	1.33	5.00
	Unsuccessful intenders	32	3.2813	1.00218	2.9199	3.6426	1.00	5.00
	Total	110	3.1636	1.03037	2.9689	3.3583	1.00	5.00
Identified	Nonintenders	26	3.0481	.89168	2.6879	3.4082	1.50	4.50
	Successful intenders	52	4.4615	.51778	4.3174	4.6057	2.50	5.00
	Unsuccessful intenders	32	4.0313	.72610	3.7695	4.2930	2.00	5.00
	Total	110	4.0023	.88079	3.8358	4.1687	1.50	5.00
Intrinsic	Nonintenders	26	2.9904	1.13464	2.5321	3.4487	1.00	4.75
	Successful intenders	52	4.4038	.59852	4.2372	4.5705	2.75	5.00
	Unsuccessful intenders	32	3.7969	.71402	3.5394	4.0543	2.25	5.00
	Total	110	3.8932	.96407	3.7110	4.0754	1.00	5.00

Note: Mean scores range between 1 - 5

Table 3 shows that the mean scores for the autonomous forms of motivation (i.e. intrinsic motivation, and identified regulation) were high, as well as introjected motivation. While the amotivation and external regulations were low. Table 3 also shows the Bivariate Correlation Analysis which showed a statistically significant positive association between SPA, external, and introjected motivation. It also showed a negative significant association to amotivation. SPA had a negative and non-significant association with identified and intrinsic forms of motivation (the most autonomous forms of motivation).

Table 3

Variable Correlations and Means/SD between SPA and behavioural regulations

	1	2	3	4	5	6	M(/SD)
1.SPAS							2.83/.82
2.Amotivation	-.221*						1.20/.45
3.External	.280**	.072					1.54/.61
4.Introjected	.298*	-.334**	.289**				3.16/1.03
5.Identified	-.003	- .523	-.217	.459**			4.00/.88
6.Intrinsic	-.044	-.436**	-.294**	.302**	.752**		3.89/.96

*Correlation is significant at the p< 0.05 level; **. Correlation is significant at the p<0.01 level

A multinomial logistic regression was performed to model the relationship between the predictors and membership in the three groups (successful intenders, unsuccessful intenders, and

nonintenders). The reference group in the model is successful intenders. The traditional .05 criterion of statistical significance was employed for all tests. The model fitting information shows that it is a good model for predicting the three groups (p<0.01).

The model summarized in Table 4, adequately fits the data because the model fit is significant. In addition, the deviance of the goodness of fit table is not significant which indicates that this model adequately fits the data p>0.05. The variables in this model can explain about 51% variance. Additionally, contribution of some variables in the model were significant (p<0.05). External (p= .031) and identified regulations (p=.016) were significant contributors to the whole model, with intrinsic motivation (p=.057) being borderline significant. Furthermore, the statistical analysis shows that the model gives good accuracies for the successful intenders 84.6% (N=44) and nonintenders 73.1% (N=19) and less than optimal accuracies for the unsuccessful intenders 37.5% (N=12). In other words, this model can make a highly accurate classification for successful intenders. However, for nonintenders and unsuccessful intenders the classification accuracy is lower.

Table 4 shows that for each point increase on the identified regulation scale, a participant was 5.55 (1/0.180) times more likely to be a successful intender than a nonintender. Thus, higher identified regulation scores significantly predicted the likelihood of an individual to be classified in the successful intender category. Additionally, external regulation significantly predicted nonintenders. Thus, the higher the external regulation score, the more likely the individual was to be a nonintender compared to a successful intender. As shown in the table, for every point increase on the external regulation scale, a participant was 4.41 times more likely to be classified in the nonintender category. Within the unsuccessful intenders group, Table 4 shows that intrinsic scores significantly predicted successful intenders more than unsuccessful intenders.

The results show that with each point increase on the intrinsic motivation scale a participant was 2.71 (1/0.369) times more likely to be classified as a successful intender than an unsuccessful intender. Thus, higher intrinsic motivation scores significantly predicted the likelihood of an individual to be classified in the successful intender category. The other motivation variables (amotivation and introjected regulation) were not significant with this model, along with SPA scores which were also not significant in this model.

Table 4

Multinomial Logistic regression - Main analysis for intention-behaviour gap

	$X^2 = 24.46$ ($df = 2$)* Nagelkerke $R^2 = .514$		
Predictors	Sig.	Exp(B)	95% Confidence Interval
Nonintenders			
SPAS	.901	1.059	(.431-2.604)
Amotivation	.937	1.076.	(.178-6.515)
External Regulation	.026	4.417*	(1.191-16.375)
Introjected Regulation	.262	.604	(.250-1.458)
Identified Regulation	.008	.180*	(.051-.640)
Intrinsic Motivation	.144	.447	(.152-1.316)
Unsuccessful intenders			
SPAS	.601	.847	(.454-1.580)

Amotivation	.415	.468	(.075-2.910)
External Regulation	.816	1.131	(.401-3.191)
Introjected Regulation	.757	1.101	(.599-2.021)
Identified Regulation	.151	.459	(.159-1.327)
Intrinsic Motivation	.023	.369*	(.156-.871)

a. The reference category: successful intenders.

b. * shows significance *p<.05

Further analysis was done for variables of interest for this study. With a correlation analysis, results found that BMI was negatively correlated with MVPA score, r (108) = -.230*, p = .016. Thus, the higher the individual's BMI the more likely that their MVPA score would be lower. Hence, individuals with higher BMI score are less likely to have regular exercise routines of moderate to strenuous levels. This is similar results to previous studies focusing on BMI.

Additionally, Table 5 shows a series of *t*-tests. In regard to intention to exercise and exercise behaviour (post-test), there was no difference in SPA by whether people intended to exercise or not and whether they reported exercise behaviour at post-test or not. However, participants who reported exercise behaviour at post-test significantly differed from those who did not report exercise behaviour for amotivation, external regulation and identified regulation and intrinsic motivation. Having the intention and not having the intention to exercise also showed significant difference in mean score for amotivation, external regulation, and intrinsic motivation. However, there was no significant differences in having the intention or not for introjected and identified regulations. Additionally, the results indicated that scores between

individuals who had fitness center memberships and those who did not have a fitness center membership had no significant mean difference in BMI. Participants who have a fitness center membership did not differ from those who did not on intention to exercise, $X^2(1) = 2.57$, $p = .108$. Similarly, there was no difference in post-test exercise behaviour between those who had fitness center membership and those who did not, $X^2(1) = 1.35$, $p = .245$ based on a chi-square test. However, having intention and not having intention to exercise did differ in exercise behaviour (post-test) scores, $X^2(1) = 30.52$, $p < .001$. Additionally, from the *t*-test results we can see that participants with a fitness center membership reported significant mean differences for having amotivation. However, fitness center memberships did significantly differ in MVPA at pre-test than those who did not have a fitness center membership, which suggests that those who exercised more regularly were more likely to have a fitness center membership. There was no difference in SPA scores by fitness centre membership group. Next, results indicated that those who had the intention to exercise did have a significant difference in mean scores for MVPA than those who did not have the intention to exercised. Additionally, participants reporting exercising at post-test did not have significantly different MVPA scores than those who reported not exercising. Moreover, those who reported exercising at post-test had statistically significant different BMI scores than those who did not report exercising at post-test. This means that BMI may have a relationship in whether people have exercise behaviours or not. Finally, based on the *t*-test results men and women did not report significant differences in SPA scores.

Table 5 also explained that people with the intention to exercise reported significant difference in mean scores for amotivation than those without the intention to exercise. Additionally, those who had exercise behaviour (post-test) also reported significant score differences for amotivation than those who did not report exercise behaviour. Moreover, mean

scores for having intention to exercise and not having the intention to exercise as well as exercise behaviour (post-test) were significantly different for external regulation scores. Furthermore, introjected motivation scores had no significant differences in mean scores between intention to exercise and no intention to exercise, as well as no significant difference between having exercise behaviour (post-test) and not having exercise behaviour. Next, scores between those with exercise behaviour (post-test) and no exercise behaviour reported significant differences in scores for identified regulation. Lastly, intrinsic motivation had significant differences in mean scores between intentions to exercise and no intention to exercise and significant score differences between exercise behaviour and no exercise behaviour (post-test).

Table 5

Sample Descriptive using t-test for different categorical variables

	Gender			**Intention**			**Exercise Behaviour (post-test)**			**Fitness membership**		
	Men	Women	t-test	Yes	No	t-test	Yes	No	t-test	Yes	No	t-test
Age	28.21 (5.06)	25.79 (5.41)	t = -2.07	26.45 (5.32)	26.27 (5.80)	t = -.150	26.40 (5.18)	26.41 (5.65)	t = .010	27.22 (5.12)	21.27 (4.35)	t = 4.26
BMI	25.00 (3.39)	23.00 (3.77)	t = -2.48	23.02 (3.31)	25.08 (4.68)	t = 2.09	22.71 (2.95)	24.21 (4.26)	**t = 2.12*** **	23.59 (3.90)	22.93 (2.78)	t = .632
SPAS	2.21 (.519)	3.04 (.807)	t = 6.23	2.82 (.843)	2.84 (.780)	t = .112	2.80 (.770)	2.85 (.877)	t = .271	2.82 (.824)	2.84 (.861)	t = -.071
MVPA	33.14 (18.95)	34.95 (25.48)	t = .344	41.54 (22.33)	11.69 (11.44)	**t= -9.01*** **	46.36 (20.06)	23.84 (22.14)	t = -5.56	34.04 (21.29)	37.33 (37.42)	**t = -.493*** **
Amotivation	1.27 (.566)	1.17 (.407)	t = -1.00	1.11 (.298)	1.50 (.689)	**t = 4.11*** **	1.11 (.310)	1.28 (.538)	**t = 2.09*** **	1.15 (.380)	1.48 (.722)	**t =1.70*** **
External	1.66 (.608)	1.50 (.614)	t = -1.24	1.43 (.498)	1.90 (.803)	**t = 2.81*** **	1.40 (.437)	1.66 (.720)	**t = -2.23*** **	1.51 (.593)	1.71 (.731)	t = -1.16
Introjected	3.22 (.907)	3.14 (1.07)	t = -.371	3.33 (.949)	2.61 (1.10)	t = - 3.23	3.36 (.924)	2.98 (1.09)	t = - 1.97	3.22 (1.00)	2.77 (1.15)	t = 1.57
Identified	4.08 (.890)	3.97 (.881)	t = -.604	4.29 (.637)	3.04 (.891)	t = - 6.64	4.46 (.517)	3.59 (.937)	**t = -6.11*** **	4.08 (.819)	3.50 (1.10)	t = 2.42
Intrinsic	3.91 (1.05)	3.88 (.937)	t = -.111	4.17 (.706)	2.99 (1.13)	**t = 5.02*** **	4.40 (.598)	3.43 (1.00)	**t = - 6.22*** **	3.93 (.926)	3.61 (1.17)	t = 1.19

*** p < .006, Indicates mean difference with Bonferroni correction

Chapter 4: Discussion

Discussion of Research Study

The purpose of the current study was to explore the relationship between the different motivation regulations proposed by OIT and the presence of SPA along with the effects both of these have on translation of young adults' intention to exercise behaviour. A way of understanding intention can be explained by the action control framework that is described as the intention-behaviour gap. This model is important because it explains why those who have the intention to perform an activity, do not always follow through with those intentions.

The hypothesis that successful intenders would have the highest autonomous motivation and lowest SPA was partially supported. The results indicated that successful intenders had higher identified and intrinsic motivation, as predicted. However, introjected motivation, amotivation and SPA were not related to whether people enacted their intentions. Additionally, the hypothesis that nonintenders would have lower autonomous motivation and higher SPA was also partially supported. As predicted, nonintenders had higher external scores (controlled forms of motivation) and lower autonomous motivation scores compared to the successful intender group. This means that if autonomous motivation scores were high, then participants were more likely to have exercise intentions and to follow through with their intentions. Thus, higher autonomous motivation scores meant that individuals were placed in the successful intender group, and if external regulation scores were high, they were more likely to be placed in the nonintender group. Consequently, people who have intrinsic types of motivation are more likely to successfully act on their intentions than those who report external types of motivation. Those who reported external types of motivation were more likely to be nonintenders than those who

had intrinsic types of motivation. These findings support research by Sicilia (2016) who indicated that having extrinsic exercise goals could hinder exercise participation levels of individuals. Ryan and Deci (2000) found that the more students were externally regulated the less they showed interest, value, and effort toward achievements. Similarly, Sheeran and Webb (2016) claim that intentions that are based on feelings about performing a behaviour, rather than those that are based on thoughts about the consequences of acting, are associated with improved predictions of behaviour. These are the same ideas proposed by OIT, where intentions that are more relevant to a person's identity (intrinsic motivation) will likely influence the probability that the intentions will be realized (successful intenders). Thus, someone who has identified intrinsic regulations towards exercise (one who loves exercising and sees this a part of their identity) is more likely to follow through with their intention to exercise more frequently than someone who does not see exercising as part of their identity and who develops more self-determined motivations towards exercise (Sheeran & Webb, 2016).

The hypothesis that unsuccessful intenders would have high autonomous motivation to exercise but would also have higher SPA in comparison to successful intenders was not supported as intrinsic scores were predictors of successful intenders. This means that the higher the intrinsic score, the more likely they were to be successful intenders. However, motivation regulations may have more to do with behaviour than intention, resulting in higher autonomous motivation being a predictor of exercise behaviour, but not necessarily of intention. Sheeran and Webb (2016) claim that factors that are autonomous and form the basis of the intention are seen to influence rates of intention realization accurately because they lead to stable intentions that have more powerful effects. This suggests that more autonomous regulations will create

intentions that will also be translated into exercise, making intention and behaviour work in conjunction to one another.

The hypothesis that successful non-intenders will have lower autonomous motivation in comparison to successful intenders but will also have low SPA was not tested as successful non-intenders were removed from the analysis due to low sample size.

SPA was not seen to have an effect on the relationship between intention and exercise behaviour (post-test) and needs to be further studied before it can be used as a predictor of exercise behaviour. This may be because there are more factors than solely SPA that affect whether intention is translated into behaviour. However, even though SPA was not related to whether people acted on their intentions, it was found that SPA did have some relationship with some of the motivation regulations. There was a negative relationship between SPA and amotivation, meaning those with higher SPA scores tended to have lower amotivation. This correlation is noteworthy as high SPA scores means the individual has a reoccurring worry of how others perceive their physique. Amotivation is the lack of motivation towards an activity, which means that an individual with amotivation does not care about the activity in question. Thus, those who do not care about exercising (higher amotivation) might have lower SPA, since they do not care about exercising. From a different perspective, it could be that those with higher SPA may be coping by having increasing efforts towards activities, which in turn would decrease amotivation. In other words, people may be more extrinsically motivated towards exercise if SPA is present. Sabiston (2007) suggest that some individuals cope with SPA experiences by increasing their efforts during activities, suggesting adaptive strategies may be used to manage SPA. Additionally, based on results, men and women did not differentiate in SPA scores which suggests that there may not be a difference between men and women when it comes to having

SPA. However, this result should be taken cautiously since there were not enough men participants compared to women participants to formulate a valid conclusion.

Other researchers have linked SPA to controlling types of motivation regulations (Brunet & Sabiston, 2009). Similarly, the current study suggested a positive correlation between SPA and external and introjected motivation, meaning that those with higher SPA scores tend to have higher external and introjected motivation, supporting the findings of Brunet and Sabiston (2009). This makes sense as controlled forms of motivations are linked to feelings of guilt, reward, and other emotions that can be closely related to SPA. Additionally, those with external regulations towards exercise may have feelings that could be fueled by the desire of changing body physique (external reward) which would in turn also increase SPA. It also makes sense that those who exercise because they feel a sense of guilt may also have increased SPA as they are more likely to associate exercising with changing body physique achievements. However, more autonomous forms of motivation (identified regulation and intrinsic motivation), intention, and behaviour did not have a significant relationship with SPA scores. Given that SPA is linked to external regulations, there is no clear explanation as to why autonomous forms of motivation were not significant. However, we can speculate that autonomous forms of motivation have no direct link to SPA in young adults specifically, or on their own. Brunet and Sabiston (2009) found that those individuals with higher SPA had lower autonomous motivations, and that less autonomous motivations were related to less physical activity levels in adolescents. Testing the direct relationship between SPA and autonomous motivation among young adults specifically may be beneficial before concluding the absence of a direct relationship between the two, since age may play a factor in these variables. Additionally, another explanation for the apparent relationship between SPA and autonomous motivation regulation is that this link may depend on

a unique combination of motivation types that each individual possesses, or because of its intra-personal and inter- personal characteristic variability instead of solely age or a specific characteristic or variable (Cox et al., 2013). Thus, it is unknown if autonomous forms of motivation may or may not have a direct relationship to SPA in young adults. Moreover, since SPA is directly related to external forms of motivation, autonomous motivation may not be as strongly linked to SPA. Feelings of SPA are more clearly linked to external feelings, such as guilt, body achievements, shame, and ego involvement than autonomous forms of motivation that include feelings that come from within and one's own free will to perform the activity.

Despite the lack of significant results of SPA in the current study, SPA is still concerning as it has been linked to negative consequences such as lower perceptions of competence and enjoyment within activities and avoidance of body displayed situations (Sabiston, Pila, Pinsonnault-Bilodeau, & Cox, 2014). Given the inconsistency of findings between multiple studies, we can suggest that a third variable, such as self-efficacy, might be worth investigating as it might mediate the relationship between SPA and exercise activity. Recently, the role of motivation regulation has been investigated as a potential mediator between SPA and physical activity behaviour. Brunet and Sabiston (2009) researched the relationship between SPA and basic psychological needs. Basic needs are necessary for people's health development, engagement, motivation, and well-being, this includes the need for autonomy, competence, and relatedness. Brunet and Sabiston (2009) found a negative relationship between SPA and basic psychological needs, which suggests that feeling that others are negatively judging one's body will limit the feelings of valuing their own physique. This may make an individual feel the need to be more isolated, increase feelings of being judged by others, and increase feelings that the decision to exercise comes from pressure rather than intrinsic motivation (Brunet & Sabiston,

2009). However, the study by Brunet and Sabiston (2009) had a sample size of 390 students, between the ages of 12-19 and the research was conducted in person. The present study had 110 participants between the ages of 18-35 and was conducted online. The age range of the present study could have played a factor, as perhaps the same results do not apply to the young adult population. Adolescents seem to experience more SPA as they are more concerned about how others view their body physique than an older population (Sicilia et al., 2016). Similarly, to the previous study mentioned, the study proposed by Sicilia (2016) indicated that SPA negatively predicted intention to be physically active through mediation of basic psychological needs and the three autonomous forms of motivation (intrinsic motivation, integrated motivation, and identified regulation). This means that the higher SPA scores the less likely individuals were to have fulfilled their needs of autonomy, competence, and relatedness. Additionally, the basic psychological need for autonomy predicted the three autonomous forms of motivation, and the need for competence predicted the three autonomous forms of motivation and introjected regulation (controlled for of motivation). Finally, the need for relatedness predicted intrinsic motivation and identified regulation. Sicilia (2016) also reported that autonomous forms of motivation positively predicted intention to exercise and that neither of the controlling forms of motivation predicted intention to exercise.

Furthermore, a study by Ginis and Sinden (2003) demonstrated that there may be more to the relationship between SPA and physical activity by concluding that other variables, such as self-presentation efficacy (one's confidence in their ability to perform a task (SPE)), have moderating effects on SPA and physical activity frequencies among older women. This result is consistent with the suggestion that there may be moderating effects, such as situation specific social cognition that effects the relationship between SPA and exercise (McAuley et al., 1995).

Thus, it would make sense that other situation specific social cognitions, such as basic psychological needs might act in the same manner.

Additionally, evaluation of SPA over a short term may not give the best representation of the relationship it has with exercise. Thus, non-significant findings may be observed in short term studies. Consequently, longitudinal studies, over a month or more may yield other findings that better represent this relationship (Chu et al., 2008; Portman et al., 2018). Nonetheless, SPA was predicted to have a relationship with exercise behaviour and motivation in the current study because exercise tends to have a lot of emphasis on the evaluations of the body which elicits a variety of positive and negative emotions towards exercise (Sabiston et al., 2014). Ryan and Deci (2000) proposed that controlling factors, such as how people feel or perceive a behaviour, indirectly influences motivation. This has led researchers to examine the relationship between SPA and voluntary exercise with their motivational sequence. However, the concluding argument for various studies indicates that SPA indirectly predicts motivational regulations and thus influences intention and behaviour to be physically active.

In my current study, SPA had no significant relationship with exercise intention and exercise behaviour (post-test). However, it did have a significant negative correlation with amotivation and a positive correlation with external and introjected regulation indicating that there is some form of relationship to the motivational regulations as proposed by the study by Sicilia (2016). However, identified and intrinsic motivation did not have any significant connection with SPA. Sicilia (2016) also reported no direct statistically significant effect of SPA on intrinsic, integrated, and amotivation. However, there is a direct link between SPA and basic psychological needs and an indirect relationship to autonomous forms of motivation that was reported. That being said, it may be that SPA only has a significant effect on autonomous forms

of motivation when basic psychological needs are taken into consideration as the basic psychological needs mediate feelings of autonomous regulations.

The intention-behaviour gap model in the current study showed similar results to those initially reported by Rhodes and Brujin (2013). Rhodes and Bruijn (2013) found that non-intenders who subsequently did not engage in PA (non-intenders) represented 21% of participants, and non-intenders who subsequently performed PA (successful non-intenders) represented 2%. Intenders who did not follow through (non-successful intenders) with PA behaviour represented 36% of the sample, and those who intend to exercise and who follow through with the behaviour (successful intenders) represent 42% of the sample (Rhodes & Bruijn, 2013). According to the results of the current study, successful intenders represented 59.1% of the sample, non-intenders represented 22.7%, and non-successful intenders represented 18.2%. Successful non-intenders represented 1.7% but were removed from the analysis. The prediction based on the sample for this study was very similar to the prediction percentages given by Rhodes and Bruijn (2013).

The current study also showed that having intention to exercise had differences in mean scores for amotivation than those without the intention to exercise. However, having exercise behaviour showed no different mean scores to those who did not have exercise behaviour (post-test). Thus, the higher the score for amotivation, the lower the probability of individuals having the intention to exercise. Since amotivation means lack of interest in the activity, it makes sense that individuals with high amotivation scores would have lower less frequent intentions towards exercise. Additionally, having intention to exercise and not having the intention to exercise as well as exercise behaviour (post-test) had significant different scores between each group for external regulation. This aligns with previous literature that the more externally motivated you

are, the less likely you are to have the intention to exercise and the less likely you are to follow through with an exercise behaviour (Sheeran & Webb, 2016).

Furthermore, introjected motivation scores had no significant differences in mean scores between intention to exercise and no intention to exercise, as well as no significant difference between having exercise behaviour (post-test) and not having exercise behaviour. This means that those with higher introjected scores were neither more or less likely to have positive intentions to exercise or to have positive exercise behaviour outcomes. Next, scores between those with exercise behaviour (post-test) and no exercise behaviour reported significant differences in scores for identified regulation. Which means that having identified motivation affects the likelihood that you will have exercise behaviour or not. Lastly, intrinsic motivation had significant differences in mean scores between having intentions to exercise and no intention to exercise and between exercise behaviour and no exercise behaviour (post-test). Accordingly, having intention to exercise or not as well having exercise behaviour or not made a difference in intrinsic motivation. However, identified scores only differed for having or not having the behaviour to exercise and not for developing the intention to exercise. Thus, those with intrinsic motivation scores were more likely to have positive exercise intentions and more likely to demonstrate more exercise behaviours. This supports previous literature that the more intrinsically motivated you are, the more likely you are to have the intention to exercise and the more likely you are to follow through with an exercise behaviour (Sheeran & Webb, 2016).

The findings of this study are very important for future research. The relationship between controlled forms of motivation and SPA signifies that there could be a potential mediation between SPA and exercise behaviour through motivation regulations or other social cognitive variables. This should be further investigated since there is a possibility that by

encouraging individuals to develop more autonomous forms of motivation, SPA could subsequently be lowered. Studies should also further investigate the relationship between controlled forms of motivation and SPA to better understand the relationship these constructs have on exercise behaviour. However, different population age groups should be used to investigate the relationship that SPA has on the intention-behaviour gap as age could be a factor that influences the relationship between SPA and intention-behaviour enactment. For example, Sicilia (2016) claims that adolescents are more sensitive to body image due to undergoing puberty which may lead to increased chances of developing SPA. By investigating this further, interventions for SPA should be created in the case that SPA interferes with exercise behaviour. Additionally, by exploring SPA further there is also a potential that the results will continue to show non-significant findings, suggesting that there is no direct link, and no relationship, to exercise behaviour.

Furthermore, creating interventions to lower SPA altogether may be a solution to diminish the impact it might have on motivational regulations and other, yet to be examined, social cognitive variables. In addition, creating SPA interventions would help individuals gain more competence, autonomy, and relatedness towards exercise behaviour, increasing their autonomous motivation which in turn would increase the chances of the individual to successfully translate their intentions into behaviour. Physical activity interventions have also been seen to help improve SPA. A study by McAuley (1995) examined the effects of a six-month physical activity intervention with a six month follow up on SPA in older adults. They found that there was a significant overall decrease in levels of SPA over 12 months which suggests that improving physical fitness and physical self-efficacy play roles in SPA. Thus,

interventions that increase physical activity levels would also cause SPA levels to decrease showing that these two variables do have a relationship to one another.

The findings proposed by the main model of my current study are critical for future studies as they show the intention-behaviour gap model very clearly. The gap between intention and behaviour is clearly signified by motivation regulations, meaning that different forms of motivation will predict different forms of exercise behaviour, as hypothesized. Intention plays a role in exercise behaviour, as proposed by the model, but other variables also impact whether intention will be translated into behaviour. The current study demonstrated that intrinsic motivation plays a factor on developing exercise behaviours. Those who have a higher intrinsic motivation score – the individuals who are internally driven to exercise – will be more likely to follow through with an exercise behaviour. Less focus on external forms of motivation and more focus on developing autonomous forms of motivation should be considered. External motivations are driven by external factors, such as rewards. Many interventions to increase exercise behaviour are driven by external rewards, such as acquiring a "better" body physique. This should be re-evaluated and reconsidered. Enforcing external motivation with external rewards, such as focusing on body images can increase SPA, which would be more harmful to the individual. A study by McAuley (1995) indicated that body composition and SPA relationships were stronger at the end of the exercise program that was provided by the study than prior to program onset, suggesting that perhaps increased sensitivity to SPA developed over the program. This would support the idea that body composition focus when trying to motivate those to exercise will feed SPA.

Further analyses indicated several other relationships worth mentioning for future studies. Results demonstrated that BMI had a negative relationship with MVPA which indicates

individuals with higher BMI score are less likely to have regular exercise routines of moderate to strenuous levels. This is similar results to previous studies focusing on BMI and should be further researched for more detailed results (Page & Fox1977; Crocker et al., 2003). However, individuals who had fitness center memberships and those who did not have a fitness center membership had no significant mean difference in BMI. This demonstrates that BMI made no difference in whether people had a fitness membership or not and BMI is not a reason that someone would get a fitness membership or not. However, fitness center membership did have a significant difference in mean score for MVPA than those who did not have a fitness center membership, which suggests that those who exercised more regularly were also likely to have a fitness center membership. However, as these variables were not the main purpose of the study, these results should be considered carefully. Nevertheless, based on the results, people who had a fitness center membership did not have a significant difference in SPA scores than those who did not have a fitness center membership, which could suggest that people with high SPA do not necessarily avoid attending gym facilities or that SPA does not dictate whether an individual uses a fitness center or not as some literature suggests (Portman et al., 2018; Hart et al., 1989). Similarly, this would need to be further investigated given the limitations of this study and given that this was not a focal point for the current study.

Next, results indicated that those who had the intention to exercise had a significant difference in mean scores for MVPA than those who did not have the intention to exercised. This may suggest that people's intentions may have a relationship with their normal exercise behaviour. In other words, individuals with high MVPA score are more likely to have the intention to exercise the following week (post-test). However, participants reporting exercising at post-test did not have significantly different MVPA than those who reported not exercising.

This suggests that MVPA is not a factor that someone would have exercise behaviour (post-test). Moreover, those who reported exercising at post-test had statistically significant different BMI scores than those who did not report exercising at post-test. However, those who reported having the intention to exercise did not have statistically significant different scores than those who did not report having the intention to exercise. This means that BMI may play some part in whether people follow through with their exercise behaviour, which would be interesting to investigate further. However, these results only show a relationship to a small population and may not show a correct representation on BMI and exercise behaviour. There are other factors, such as weight bias, that could affect the reasons that BMI has some part in whether people follow through with exercise behaviour or not. Thus, these results should be further investigated before any valid conclusions can be made. Moreover, gender differences did not report significance in SPA scores. However, these results should be considered carefully since there were much fewer men participants than there were women. Finally, the results showed that having the intention or not and having exercise behaviour or not were very different in scores with one another. This means that intention and behaviour are highly related to each other and intention may play a big factor in whether individuals follow through with their behaviour. This idea was also supported by the study by Rhodes and Bruijn (2013) and their intention-behaviour gap theory.

To summarize, the current study showed that individuals who have higher identified regulation scores – a more autonomous form of motivation – are more likely to follow through with their exercise behaviour. Thus, this supports that autonomous forms of motivation are important when it comes to exercise behaviour enactment. Additionally, individuals with higher intrinsic motivation scores are more likely to develop intentions to exercise that will translate into behaviour than those who develop an intention to exercise but do not translate that intention

into exercise behaviour. These significant findings are important to further investigate as they follow the theoretical perspectives that are presented in previous literature. This means that there is a great need to develop interventions within the exercise field to create more autonomous forms of motivation when it comes to exercise behaviour. This can be done when providing social contexts that support autonomous regulations by supporting basic needs which will facilitate internalization of regulatory processes. Thus, both autonomy support and autonomous regulation is important for behaviour change (Deci & Ryan, 2000). By providing an intervention that creates a sense of autonomy support, structure, and involvement, autonomous regulation may increase since it corresponds to psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000). Using intervention strategies that have been known to increase autonomous motivation would validate the intervention method. More autonomous motivation will result in increased intention to exercise and increases in rates of exercise behaviour. Understanding autonomous regulations as a predictor of behaviour change is an important topic for many reasons, especially for developing effective exercise promotion interventions. Additionally, health care professionals could help individuals shift the mindsets of others to "want" instead of "need" by teaching them certain behaviour change skills. Skills such as goal setting and self-monitoring are key behaviours that promote autonomous regulation. Strategies such as verbalizing behaviour goals, identifying factors that encourage autonomous regulations, promoting competence and confidence, support for autonomy, self-initialization by assuring choices are all ways to promote autonomous forms of motivation. Moreover, exploring individuals' values, meanings, and goals and how this can link to their exercise behaviour change are great ways to help promote autonomous motivation (Silva, et al., 2011).

Further research should be conducted to re-create a similar study with different population groups so that the variables that were not significant could be investigated further. Additionally, adding another variable, such as self-efficacy, or the basic psychological needs as a mediator or moderator, might facilitate the findings of a relationship between SPA and the intention-behaviour gap. As previously mentioned, SPA has properties that demonstrate features in physical environments and interpersonal and intrapersonal context variability which may contribute to the nonsignificant direct findings towards exercise. It may be the that there is more of an indirect relationship towards exercise when looking at SPA and the relationship with the intention behaviour gap model than a direct relationship. Furthermore, it would be beneficial to conduct a longitudinal study that has more than one week in between phases in order to give a more realistic prediction of outcomes and validity to the study. Lastly, it would be advantageous to conduct the questionnaires in person, as opposed to the questionnaires being administered online, as any questions regarding the questionnaires could be answered directly by the researcher, yielding more consistency and validity to the results.

Limitations

Although the present findings contribute to some of our understanding of how SPA and motivation regulations contribute to the intention-behaviour gap, there are limitations to this study. Firstly, this study was conducted online, which means that individuals did not have the opportunity to ask any questions. The study included a specific age group limited to young adults between 18-35 which may limit the generalization of the findings. Thus, this study should be replicated with different age groups as some of the variables in question may change for each age group. Additionally, much of the population seemed to be active individuals which also could limit the generalization of this study, since recruitment was limited to mostly social media and

UofA student newsletters. Having a more diverse group of individuals would bring more generalizability to the study. In addition, using self-reported questionnaires is also a limitation as self-report does not guarantee accuracy due to limitations in memory. Participants could also be reporting based on social desirability. Another factor that is considered a limitation is the time of year this study was conducted. The study was done during the month of November and December which includes months of higher stress for students and individuals with families. Avoiding times that includes final exams and major holidays could have been helpful to getting a range of different individuals and more participation desirability.

Differences between men and women results were also inconclusive as not enough men participants were recruited. This added further limitations to the study as there may be several unknown differences in variable scores between genders. As mentioned previously, several studies have inconclusive results that women are more likely to have higher SPA. Consequently, men should also be studied as they are also at risk for having SPA. That being said, SPA scores may have been skewed due to more women being present in the study, thus yielding the results that SPA between genders had no significant differences. Additionally, having a sample of primarily women may bring other limitations to the sample in terms of difference in various scale scores, how women answer certain questions vs men, interpretation of questions and other gender limitations that may have also been an issue. Finally, the study was a longitudinal study with only one week apart. Having this study replicated with more time in between both phases could be beneficial to see the relationship patterns between SPA and motivation regulations on the intention-behaviour gap model, leading to more realistic results.

Concluding statement

Overall, the current study can be used as a starting point for future research. Even though SPA was not related to the enactment of intention, it nonetheless affects many individuals. The current study supports previous research by demonstrating that motivation regulations are important to consider when evaluating exercise and increasing exercise behaviours. Additionally, the intention-behaviour gap model needs to be considered when investigating exercise behaviours and the role of motivational regulations in the intention-behaviour gap. If this gap is to be diminished, interventions will need to be developed in order to increase people's autonomous regulations and less focus should be given to motivating people with external rewards, which increase external motivation.

References

Ajzen, I., & Madden, T. J. (1986). Prediction of Goal-Directed Behaviour: Attitudes, Intentions, and Perceived Behavioural Control. *Journal of Experimental Social Psychology*, 453-474.

Brickell, T. A., & Chatzisarantis, N. L. (2007). Using self-determination theory to examine the motivational correlates and predictive utility of spontaneous exercise implementation intentions. *Psychology of Sport and Exercise*, 758-770.

Brunet, J., & Sabiston, M. C. (2009). Social physique anxiety and physical activity: A self-determination theory perspective. *Psychology of Sport and Exercise*, 329–335.

Brunet, J., & Sabiston, C. M. (2011). In The Company We Keep: Social Anxiety Levels Differ Around Parents and Peers. *Journal of Health Psychology*, 42-49.

Cash, T. F., & Smolak, L. (2011). *Body Image: A handbook of science, practice, and prevention.* New York: NY: Guilford.

Caspersen, C. J., Powell, E. K., & Christenson, M. G. (1985). Physical Activity, Exercise, and Physical Fitness: Definitions and Distinctions for Health-Related Research. *Public Health Reports*, 126-131.

Chatzisarantis, N. L., Biddle, S. J., & Meek, A. G. (1997). A self-determination theory approach to the study of intentions and the intention-behaviour relationship in children's physical activity. *British Journal of Health Psychology*, 343-360.

Chatzisarantis, N. L., Biddle, S. J., & Meek, G. A. (1997). A self-determination theory approach to the study of intentions and the intention-behaviour relationship in children's physical activity. *British Journal of Health Psychology*, 343-360.

Chu, H.-W., Bushman, B., & Woodard, R. (2008). Social Physique Anxiety, Obligation to Exercise, and Exercise Choices Among College Students. *Journal of American College Health*, 7-13.

Cohen, J. (1992). Quantitative Methods in Psychology: A Power Primer. *Psychological Bulletin*, 155-159.

Cox, A. E., Ullrich-French, S., & Sabiston, C. M. (2013). Using motivation regulations in a person-centered approach to examine the link between social physique anxiety in physical education and physical activity-related outcomes in adolescents. *Psychology of Sport and Exercise*, 461-467.

Crawford, S., & Eklund, R. C. (1994). Social Physique Anxiety, Reasons for Exercise, and Attitudes Toward Exercise Settings. *Journal of Sport and Exercise Psychology*, 70-82.

Crocker, P., Sabiston, C., Forrestor,S., Kowalski N., Kowalki K., McDonough, M. (2003). Predicting Change in Physical Activity, Dietary Restraint, and Social Physique Anxiety in Adolescent Girls. Examining Covariance in Physical Self-perception. *Canandian Journal of Health,* 332-337

D' Abundo, M. L., Sidman, C. L., Milroy, J., Orsini, M., & Fiala, K. (2014). Construct Validity of College Students' Responses to the Behavioural Regulation in Exercise Questionnaire (BREQ-2). *Recreational Sports Journal*, 40-49.

Deci, E. L., & Ryan, R. M. (2008). Self-Determination Theory: A Macrotheory of Human Motivation, Development, and Health. *Canadian Psychological Association*, 182–185.

Deci, E., & Ryan, R. (2000). The ''what'' and ''why'' of goal pursuits: human needs and the self-determination of behaviour. *Psychol Inq*, 227–68.

Frederick, M. C., & Morrison, S. C. (1996). Social Physique Anxiety: Personality constructs, Motivations, Exercise Attitudes, and Behaviours. *perceptual and Motor Skills*, 963-972.

Gilmour, H. (2007). Physically active Canadians. *Health Reports*, 45-65.

Ginis, K., & Sinden, A. (2003). Physical Activity and Social Physique Anxiety in Older Women: The Moderating Effects of Self-presentation Efficacy. *Journal of Applied Bio behavioural Research*, 116-127.

Godin, G. (2011). The Godin-Shephard Leisure-Time Physical Activity Questionnaire. *Health & Fitness 2011;4(1):18-22. Journal of Canada*, 18-22.

Godin, G., & Shephard, R. J. (1985). A Simple Method to Assess Exercise Behaviour in the Community. *Exercise Behaviour in the Community*, 141-146.

Hart, E. A., Leary, M. R., & Rejeski, J. (1989). The Measurement of Social Physique Anxiety. *Journal of Sport and Exercise Psychology*, 94-104.

Hurst, R., Hale, B., Smith, D., & Collins, D. (2000). Exercise dependence, social physique anxiety, and social support in experienced and inexperienced bodybuilders and weightlifters. *Br J Sports Med*, 431–435.

Kendzierski, D. (1988). Self-Schemata and Exercise. *Basic and Applied Social Psychology*, 45-59.

Kruisselbrink, D. L., Dodge, A. M., Swanburg, S. L., & MacLeod, A. L. (2004). Influence of Same-Sex and Mixed-Sex Exercise Settings on the Social Physique Anxiety and Exercise Intentions of Males and Females. *Journal of Soirt & Exercise Psychology*, 616-622.

Lantz, C. D., & Hardy, C. J. (1997). Social physique anxiety and perceived exercise behaviour. *Journal of Sport Behaviour*.

Markland, D., & Tobin, V. (2004). A Modification of the Behavioural Regulation in Exercise Questionnaire to Include an Assessment of Amotivation. *Journal of Sport and Exercise Psychology*, 191-196.

Markus, H. (1977). Self-Schematic and processing Information about the Self. *Journal of Personality and Social Psychology*, 63-78.

Martin, K. A., Rejeski, J. W., Leary, M. R., McAuley, E., & Bane, S. (1997). In the Social Physique Anxiety Scale Really Multidimensional? Conceptual and Statistical Arguments for a Unidimensional Model. *Journal of Sport & Exercise Psychology*, 359-367.

McAuley, E., Bane, S., Rudolph, D., & Lox, C. (1995). Physique Anxiety and Exercise in Middle-aged Adults.

Mullan, E., Markland, D., & Ingledew, D. K. (1997). A graded conceptualisation of self-determined behaviour: Development of a measure using confirmatory factor analytic procedures. *Person. individ.Diff.*, 745-752.

Page A, Fox K. Adolescent weight management and the physical self. In Fox K (Ed.), The Physical Self: From Motivation to Well-being. *Champaign, IL: Human Kinetics, 1997;229-56.*

Portman, R. M., Bradbury, J., & Lewis, K. (2018). Social physique anxiety and physical activity behaviour of male and female exercisers. *European Journal of Sport Science*, 257–265.

Rhodes, R. E., & Bruijn, G.-J. D. (2013). What Predicts Intention-Behaviour Discordance? A Review of the Action Control Framework. *Exercise and Sport Sciences Reviews*, 201-207.

Rhodes, R. E., & Rebar, A. L. (2017). Conceptualizing and Defining the Intention Construct for Future Physical Activity Research. *Exercise and Sport Sciences Reviews*, 209-2016.

Rodger, W. M., & Wilson, P. M. (2002). The Relationship Between Exercise Motives and Physical Self-Esteem in Female Exercise Participants: An Application of Self-Determination Theory. *Journal of Applied Biobehavioural Research*, 30-43.

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, 68-78.

Sabiston, C. M., Pila, E. M., & Thogersen-Ntoumani, V. C. (2019). Body image, physical activity, and sport: A scoping review. *Psychology of Sport & Exercise*, 48-57.

Sabiston, C. M., Sedgwick, W. A., & Crocker, P. R. (2007). Social Physique Anxiety in Adolescence An Exploration of Influences, Coping Strategies, and Health Behaviours. *Journal of Adolescent Research*, 78-101.

Sabiston, Pila, E., Pinsonnault-Bilodeaua, G., & Cox, A. E. (2014). Social physique anxiety experiences in physical activity: a comprehensive synthesis of research studies focused on measurement, theory, and predictors and outcomes. *International Review of Sport and Exercise Psychology*, 158-183.

Schlenker, B. R., & Leary, M. R. (1982). Social Anxiety and Self-Presentation: A Conceptualization and Model. *Psychological Bulletin*, 641-669.

Sheeran, P., & Orbell, S. (1999). Implementation intentions and repeated behaviour: augmenting the predictive validity of the theory of planned behaviour. *European Journal of Social Psychology*, 349-369.

Sheeran, P., & Webb, T. L. (2016). The Intention–Behaviour Gap. *Social and Personality Psychology Compass*, 503–518.

Sicilia, A., Sáenz-Alvarez, P., González-Cutre, D., & Ferriz, R. (2016). Social Physique Anxiety and Intention to Be Physically Active: A Self-Determination Theory Approach. *RESEARCH QUARTERLY FOR EXERCISE AND SPORT*, 354-364.

Silva, M., Markland, D., Carraca, E., Vieira, P., Coutinho, S., Minderico, C., . . . Teixeira, P. (2011). Exercise Autonomous Motivation Predicts 3-yr Weight Loss in Women. *Medicine & Science in Sports & Exercise*, 728-737.

Singley, A., & Bushman, B. A. (2004). Social physique anxiety and obligation to exercise in female college students. *Missouri Journal of Health, Physical Education, Recreation & Dance* , 49-54 .

Statistics Canada. (2019, 04 17). Retrieved from Tracking physical activity levels of Canadians, 2016 and 2017: https://www150.statcan.gc.ca/n1/daily-quotidien/190417/dq190417g-eng.htm

Tremblay, M. S., Warburton, D. E., Janssen, I., Paterson, D. H., Latimer, A. E., Rhodes, R. E., . . . Duggan, M. (2011). New Canadian Physical Activity Guidelines. *Appl. Physiol. Nutr. Metab.*, 26-46.

Van Raalte, J. L., Cunningham, J., Cornelius, J., & Brewer, W. B. (2004). Environmental effects on social physique anxiety. *Kinesiologia Slovenica, 10*, 85-95.

Wilson, P. M., Mack, E. D., & Grattan, P. K. (2008). Understanding Motivation for Exercise: A Self-Determination Theory Perspective. *Canadian Psychology*, 250-256

Appendix

Appendices A: Recruitment sheet

Exercise Behavior Study
Opportunity to participate in a research study

You are eligible if:

- ∀ You are an adult (Between and including ages 18 to 35)
- ∀ You are comfortable reading and understanding English

Participants will engage in an online survey during the first week, and another short survey the second week. The whole process will take about 10 minutes the first week and no longer than 3 minutes the second week. This can be done from any computer and no meeting is necessary.

If you are interested in participating, please contact **Izabela Figueiredo** by:

Email: pames@ualberta.ca with subject **"Exercise behavior study"**

Thanks! We appreciate your interest!

Principal Investigator:

Izabela Figueiredo,

Faculty of Kinesiology, Sport, and Recreation.

Pro00094752

Appendices B: Information Sheet

Information Sheet

Study title: The Intention-behavior gap for exercise

Principal Investigator:
Izabela Figueiredo, MSc Candidate.
Faculty of Kinesiology, Sport, and Recreation, University of Alberta
8840-114st NW Edmonton, AB T6G 2H9
ifigueir@ualberta.ca

Supervisor:

Dr. Tanya Berry,
Faculty of Kinesiology, Sport, and Recreation, University of Alberta
8840-114st NW Edmonton, AB T6G 2H9
Tanyab@ualberta.ca

You are invited to participate in a research study. The purpose is to examine exercise behavior, motivation and social physique anxiety (when individuals have concerns that others may be judging their physical appearance) among young adults. You will be asked to complete some questionnaires on any computer at two time points, one week apart. The total time it will take for you to participate is about 23 minutes (20 minutes for the first session and no longer than 3 minutes for the second)**.** You will be asked to provide your e-mail so that we can contact you for the second part of the survey. Your e-mail will immediately be deleted from the data file after the second survey is completed. There are no risks to participating in this survey. The benefit to you might be just helping us out and hopefully helping design future research. The results of this study will be used in research papers and presentations. This study is part of my MSc thesis.

Your participation is completely voluntary, and you can quit at any time. Your responses will be kept private. Only the research team will have access to the data. You will be assigned a code number that will be associated with your e-mail until the end of the study at which point any identifying information will be deleted. Data can only be removed from the data set until the post-test. No person will be identified in any research presentations or papers. Normally data are kept for a period of five years post-publication, after which it is destroyed. If you don't want to answer a question or wish to stop at any time for any reason you are free to do so.

By starting the survey, you indicate that you understand and agree to participate in this research study.

If you have questions or concerns about the study, please feel free to contact any of the investigators listed above. The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at 780-492-2615 (reoffice@ualberta.ca). This office has no affiliation with the study investigators.

Sincerely,

Izabela
Figueiredo

ifigueir@ualberta.ca
Pro00094752

Appendices C: Questionnaires

Information sheet immediately precedes the questionnaire itself.

Session one questionnaires

Demographics

Age (in years):

Gender:

Height:

Weight:

1. Are you a fitness center member? Yes/No

2. How long have you been an active fitness center member (e.g., Goodlife, a recreation centre, L.A Fitness, etc...)? Check appropriate.

6 months or less___. 7month to 1 year___. More than 1 year___. More than 3 years ___.

3. How many times a week (in a 7-day period) do you typically attend a fitness center? Check appropriate.
0 ___ 1 ____ 2 ____ 3-4 ____ 5-6 _____ 7+ ____

The Leisure Time Exercise Questionnaire of Godin and Shephard

(1) Considering a 7-day period (a week) how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time?
• strenuous exercise (heart beats rapidly): number of times in week
• moderate exercise (not exhausting): number of times in week
• mild exercise (minimal effort): number of times in week
(2) Considering a 7-day period (a week) during your leisure time how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?
• often
• sometimes
• never or rarely
Strenuous exercise (9 METS): running, jogging, hockey, football, soccer, squash, basketball, cross country, skiing, judo, roller skating, vigorous swimming, vigorous long distance, bicycling.
Moderate exercise (5 METS): fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing.
Mild exercise (3 METS): yoga, archery, fishing from river, bank bowling, horseshoes, golf, snow mobiling, easy walking.
activity score in arbitrary units =

= (9 * (number of strenuous exercise episodes)) + (5 * (number of moderate exercise episodes)) + (3 * (number of mild exercise episodes))

Social Physique Anxiety Scale (Martin et.al, 1997)

The following questionnaire contains statements concerning your body physique or figure. By physique or figure we mean your body's form and structure; specifically, body fat, muscular tone, and general body proportions.

Instructions: Read each item carefully and indicate how characteristic it is of you according to the following scale.

1 = Not at all characteristic of me
2 = Slightly characteristic of me
3 = Moderately characteristic of me

4 = Very characteristic of me
5 = Extremely characteristic of me

* = Reverse Score = 45 max points

_____ 1. I wish I wasn't so uptight about my physique or figure.

_____ 2. There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively.

_____ 3. Unattractive features of my physique or figure make me nervous in certain social settings.

_____ 4. In the presence of others, I feel apprehensive about my physique or figure.

_____ 5. I am comfortable with how fit my body appears to others. *

_____ 6. It would make me uncomfortable to know others were evaluating my physique or figure.

_____ 7 When it comes to displaying my physique or figure to others, I am a shy person.

_____ 8. I usually feel relaxed when it's obvious that others are looking at my physique or figure. *

_____ 9. When in a bathing suit, I often feel nervous about how well-proportioned my body is.

Exercise Regulation Questionnaire (BREQ-2)

We are interested in the reasons underlying peoples' decisions to engage, or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you.

Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.

1. I exercise because other people say I should

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

2. I feel guilty when I don't exercise

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

3. I value the benefits of exercise

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

4. I exercise because it' s fun

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

5. I don't see why I should have to exercise

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

6. I take part in exercise because my friends/family/partner say I should

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

7. I feel ashamed when I miss an exercise session

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

8. It's important to me to exercise regularly

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

9. I can't see why I should bother exercising

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

10. I enjoy my exercise sessions

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

11. I exercise because others will not be pleased with me if I don't *

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

12. I don't see the point in exercising

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

13. I feel like a failure when I haven't exercised in a while

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

14. I think it is important to make the effort to exercise regularly

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

15. I find exercise a pleasurable activity

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

16. I feel under pressure from my friends/family to exercise

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

17. I get restless if I don't exercise regularly

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

18. I get pleasure and satisfaction from participating in exercise

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

19. I think exercising is a waste of time

Not true for me Sometimes true for me Very true for me

0 1 2 3 4

Decisional Intention Questionnaire

1. Next week (in a 7day period), I intend to exercise for at least 150 minutes: Yes/No

2. How many times in the next week (in a 7day period), do you intend to exercise for at least 30 minutes? Check appropriate.

   0 ___ 1 ____ 2 ____ 3-4 ____ 5-6 _____ 7+ ____

4. Of those exercise sessions, how many times a week (in a 7day period), do you intend to exercise in a fitness center? Check appropriate.

   0 ___ 1 ____ 2 ____ 3-4 ____ 5-6 _____ 7+ ____

Session 2: Exercise Behavior Questionnaire

As you have previously agreed to, participation is voluntary, you can skip question or withdraw at any time. However, withdrawal will not be possible after your responses have been submitted.

Please answer the following:

1. How many times did you exercise during the past week (in a 7day period) for at least 30 minutes? Check appropriate.

   0 ___ 1 ____ 2 ____ 3-4 ____ 5-6 _____ 7+ ____

2. Of those exercise sessions, how many of them took place in a fitness centre (e.g., Goodlife, a recreation centre, L.A Fitness, etc...) ? Check appropriate.

   0 ___ 1 ____ 2 ____ 3-4 ____ 5-6 _____ 7+ ____