OPTIMAL EXPERIENCES AND EXERCISE ADHERENCE:
THE ROLE OF FLOW AND MOTIVATION

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requirements for the degree of
The purpose of this study was three-fold: (1) to determine if there was a relationship between now experienced by exercise participants, motivation to exercise, and exercise adherence; (2) to what extent is now associated with exercise adherence; and (3) what are the differences (if any) in now experienced and motivation to exercise among active versus less active exercise participants. The study used a cross-sectional quantitative survey design. A purposive sampling technique was used to recruit 100 individuals who participated in various physical activity programs within St. John's. \( M_{age} = 27.8 \); 80% female). Exercise adherence was measured using the Spons Physical Activity Index (Spons PA) of the Baecke Questionnaire of Habitual Physical Activity. Predictor variables included now experienced during exercise participation (Dispositional Flow Scale-2) and motivation to exercise (Motives for Physical Activities Measure-Revised). Results determined that now did not have a strong relationship with physical activity adherence. Future research suggests examining other variables such as efficacy for flow and goal orientations. As this study was exploratory in nature, it is suggested that this study be replicated and expanded to examine athletes in highly competitive situations.
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where I am today if it weren't for you. Katie, thank you for your help during this process. Your willingness and dedication to help was greatly appreciated. Thank you to all!
2.4.2 Theory of Reasoned Action and Theory of Planned Behaviour
2.8.1 Experience Sampling Method

2.8.3 Privette Experience Questionnaire

2.8.4 Dispositional Flow Scale

2.11 Significance of the Study

3.2 Participants, Sampling and Data Collection
5.4 Relationship Between Physical Activity Participation, Flow, and Motivation
5.4.1 Flow and Sport Physical Activity Participation

5.4.2 Motivation and Sport Physical Activity Participation

5.4.3 Extent of Flow’s Association with Exercise Adherence

5.5 The Experience of Flow and Motivation Among Active versus

5.5.2 The Experiences of Flow and Motivation Among

5.8 Recommendations for Practitioners/Guidelines to Achieving Flow

5.8.1 Establishing Order in Consciousness

5.8.2 Making External Conditions Match Our Goal

5.8.3 Changing our Experience of External Conditions and
Table I Descriptive Statistics for Work Physical Activity
Table 2 Descriptive Statistics for Leisure Physical Activity
Table 3 Descriptive Statistics of Dispositional Flow Scale-2
Table 4 Descriptive Statistics of Motives for Physical Activities Measure-Revised Scale
Table 5 Hierarchical regression analysis of Sport PA and Total Flow and controlling for socio-demographics and motivation
Table 6 Hierarchical regression analysis of Sport PA and the Challenge-Skill Balance dimension of Flow controlling for socio-demographics and motivation
Table 7 Hierarchical regression analysis of Sport PA and the Merging of Action and Awareness dimension of Flow controlling for socio-demographics and motivation
Table 8 Hierarchical regression analysis of Sport PA and the Clear Goals dimension of Flow controlling for socio-demographics and motivation
Table 9 Hierarchical regression analysis of Sport PA and the Uncertainty Feedback dimension of Flow controlling for socio-demographics and motivation
Table 10 Hierarchical regression analysis of Sport PA and the Concentration on the Task at Hand dimension of Flow controlling for socio-demographics and motivation
Table 11 Hierarchical regression analysis of Sport PA and the Sense of Total Control dimension of Flow controlling for socio-demographics and motivation
Table 12 Hierarchical regression analysis of Sport PA and the Loss of Self-Consciousness dimension of Flow controlling for socio-demographics and motivation
Table 13 Hierarchical regression analysis of Sport PA and the Transformation of Time dimension of Flow controlling for socio-demographics and motivation
Table 14 Hierarchical regression analysis of Sport PA and the autoleptic dimension of Flow controlling for socio-demographics and motivation
Table 15 Descriptive Statistics and T-Tests of Active versus Sedentary Exercise Participants in the Reporting of Flow

Table 16 Descriptive Statistics and T-Tests of Active versus Sedentary Exercise Participants in the Reporting of Motivation
2. Sport PA = Sport Physical Activity
Exercise adherence is one of the most highly researched and talked about phenomena in exercise and health related literature alike. In fact, many researchers such as Dishman and McAuley, to name a few, have conducted much research on the exercise adherence process and factors that influence adherence. Exercise adherence has a direct impact on our lives and our overall health as there are many health benefits associated with physical exercise. While most people are cognizant of the benefits of physical activity, attempting to get sedentary individuals to commence exercising and active individuals to maintain exercising has proven to be problematic (Dishman, 1994). Obesity rates continue to rise in Canada, with Newfoundland reporting the highest levels. In fact, with respect to Canada in 2008 as a whole, reports of height and weight of 17.2% of Canadians ages 18 and older were classified as obese (Statistics Canada, 2009). Additionally, from 2003-2008, obesity among men and women increased from 16.0% to 18.3% and 14.5% to 16.2% respectively (Statistics Canada, 2009). Finally, in a study of overweight individuals, 58.6% of men and 43.8% of women were at an increased health risk due to their weight (Statistics Canada, 2009). As obesity rates are a continuing problem in society, it is important to determine why individuals live sedentary lifestyles and explore the corresponding motives towards exercise among physically active...
There are many factors that can determine one's participation in physical activity and adherence to a particular exercise regime. As motivational characteristics are one of the crucial determinants in commencing or continuing a particular activity, the state of flow, totally absorbed in what one is doing, to the exclusion of all other thoughts and emotion (Jackson & Csikszentmihalyi, 1999). Although exercise adherence, motivation, and flow have all been studied extensively, there has yet to be a study that has examined all three variables and their relationships to one another. Furthermore, many theories have been used to study exercise adherence such as the Transtheoretical Model and Protection Motivation theory; however, flow has not been one of them. It has been suggested that highly motivated individuals experience high instances of the flow state (Kowal & Fortier, 1999). Additionally, self-motivation was consistently found to have a positive association with physical activity. Dishman and Sallis (1994) and Grove and Lewis (1996) reported that participants involved in an exercise program (i.e., circuit training) did experience flow and that the flow states generally increased as the exercise was prolonged. However, it is not known if a relationship exists among flow, motivation, and exercise adherence. Therefore, this study is unique in that it seeks to determine the relationships between exercise adherence, flow, and motivation. The objective is to examine the possible instances of flow in the course of exercise participation in addition
examine these three factors and their interrelationships in order to conclude influences

Specifically, Jackson et al. (1998) determined that perceived ability had the most substantial correlations with outcomes with regards to swimming, triathlon, cycling, and track and field. Furthermore, Csikszentmihalyi and Nakamura (1989) determined that there is a need for the challenges and skills to be reasonably high prior to experiencing an 'Oow' like experience. Therefore, athletes who have confidence in their abilities should be expected to experience a challenge/skill balance, although the challenge or panic in a particular activity may be high (Jackson et al., 1998). Bassi et al. (2003), in his study to investigate the quality of experience and risk perception associated with high-altitude rock climbing, determined that 'Oow' was the most frequently reported experience among the rock climbers and Grove and Lewis (1996) reported that participants involved in circuit training did experience 'Oow' and that the 'Oow' states generally increased as the exercise was prolonged. However, there is limited research examining the effect of exercise on adhering to a particular exercise regime. This study will attempt to uncover this area as I believe that one's motives and psychological state is directly related to our
The following chapter will discuss various factors of motivation and its corresponding attributes, a range of theories of exercise adherence and a description of the theory of flow. A review of the literature of the previously mentioned factors is then provided. Finally, the relationships amongst these factors will be discussed.

Adhering to an exercise program poses many dilemmas in terms of developing a healthy lifestyle. In fact, research has determined that approximately half of the participants who enroll in a supervised exercise program withdraw within 6 months (Dishman, 1988). Reasons cited for the discontinuation of exercise include injury, lack of direction, unrealistic goals, inability to slowly progress within an exercise program, lack of professional guidance, lack of support (Downs & Hassenblas, 2005), and unrealistic expectations with regards to weight loss (Sullivan, 1998). There are numerous factors of personal attributes, environmental factors and physical activity characteristics (Dishman, 1990). With regards to physical activity characteristics, Dishman and Sallis (1994) discovered that self-motivation, prior program participation, and social support from spouse and family were consistently documented as having a positive association with physical activity. On the contrary, perceived lack of time and perceived deficit demonstrated a negative association with physical activity. Many of the above reasons for
is likely to be present in situations that permit satisfaction of the needs for autonomy and competence. These types of circumstances are characterized as being informational (Deci et al., 1980). Although perceived competence is essential for motivation, perceived autonomy is compulsory for intrinsic motivation (Deci & Ryan, 2000).

There have been many studies that have showed the relationship between intrinsic motivation and competence. For instance, research has supported the concept that autonomy is essential to intrinsic motivation by showing that events such as threats (Deci & Cascio, 1972), surveillance (Lepper & Greene, 1975), evaluation (Larackiewicz et al., 1984), and deadlines (Amabile et al., 1976) led to a decrease in intrinsic motivation (Deci & Ryan, 2000). In contrast, providing choice (Zuckerman et al., 1978) and acknowledging people’s inner experience (Koestner et al., 1984) augments intrinsic motivation and increases people’s confidence in their performance in their activities (Tafarodieta et al., 1999). The following section will discuss another form of motivation.

Extrinsic motivation is another important type of motivation as it is difficult to find an activity that is purely intrinsic. Extrinsic motivation is defined as behaviors that are considered a means to an end (Deci et al., 2000). Similarly, it refers to the performance of an activity in order to attain some separable outcome (Deci & Ryan, 2000). The primary
goal for extrinsic motivation is to gain awards and avoid punishment. Extrinsic motivation has been classified into two different types of motivation: self-determined extrinsic motivation, which is when an individual engages in a particular activity due to personal choice, and non-self-determined extrinsic motivation, which is present when an individual places pressure on themselves in order to perform an activity or when they believe their behaviours are controlled by various external factors (Kowal & Fortier, 2010).

Various theories have been used to predict and explain exercise adherence. Additionally, many of these theories contain the construct of motivation. Theories such as the Transtheoretical Model, Theory of Reasoned Action and Theory of Planned Behaviour, Protection Motivation Theory, Social Cognitive Theory, Reversal Theory and the Self-Determination Theory have all been researched in conjunction with exercise adherence. The following section will therefore discuss these theories and their

The Transtheoretical Model (Prochaska & DiClemente, 1983) suggests that the relative strength of intrinsic or extrinsic motives to exercise has been found to change across many stages: the preparation stage (individual is considering exercise as a potential activity), the action stage (exercise has been performed for less than 6 months) and the maintenance stage (exercise has been performed for more than 6 months).
(Prochaska et al. 1983). In the preparation and action stages, extrinsic motives appear to be stronger whereas in the maintenance stage, intrinsic motives are more prominent (Ingledew et al. 1998). People who begin to exercise based on extrinsic motivations are less likely to continue with the particular activity if this remains the sole motivator (Ryan et al. 1997; Wankel 1993). Although extrinsic motives are essential when one is deciding whether or not to partake in a particular exercise regime, intrinsic motives are

The Theory of Reasoned Action and Theory of Planned Behaviour

According to the Theory of Reasoned Action (Ajzen et al. 1980; Fishbein et al. 1975), what one's intentions are (or are not), otherwise known as behavioural intentions, are one of the primary causes of behaviour. An individual's behavioural intentions are thereby influenced by their attitudes of the particular behaviour and their evaluation of other people's opinions. It is important to consider these factors as they can be important predictors of behaviour (Trafimow, 2009). Much of this theory consists of various types of salient beliefs, which are defined as beliefs which are first brought to mind when being asked an open-ended question (Sutton et al. 2003). Salient behavioural beliefs (attitudes with regards to the potential consequences when performing the behaviour) predict one's significant others' aid in determining their viewpoints of important individuals and their motivation to comply with their ideals (Sutton et al. 2003). In addition, salient control
paintings in their completed form were not expected to generate much, if any, revenue nor were rewards present. Therefore, why did the painters exert so much effort into their paintings if they would receive next to nothing in return? What was motivating these painters to paint? These questions plagued Csikszentmihalyi as he felt that all human behaviours happened for a reason; no matter how complex these behaviours might be (Csikszentmihalyi & Csikszentmihalyi, 1988)

Despite much of societal research at the time being directed towards the explanation of behaviour in terms of rewards or extrinsic values, Abraham Maslow, a highly acclaimed American Psychologist known for his development of the Hierarchy of Human Needs, appeared to have made a breakthrough to this mystery. Maslow's research played on much of the highly acclaimed condition of intrinsic situations (self-rewarding) limitations through intense activity and experience. Although this provided great insight into why the painters experienced so much enjoyment from painting, many questions were still left unanswered: (1) do all activities contain an intrinsic component? and (2) is everyone capable of experiencing intrinsic motivation? While these questions are ambiguous in nature, it is dear that individuals create enjoyment in and of their activity, foundation of the development of the theory, known as Slowl (Csikszentmihalyi &
challenges), which are matched with the person's own capacities to act (or skills)"
(Csikszentmihalyi & LeFevre. 1989, p. 2). Consequently, the complete opposite can occur. If your skills are greater than the task at hand, boredom is likely to occur whereas if the task at hand exceeds your skills or capabilities, anxiety is likely to occur. In both of these cases, performance is expected to decrease (Weinberg & Gould. 2003)
Specifically, individuals should partake in activities that are best suited to their own capabilities. For example, if a beginner chess player (i.e., low skill) is placed in an experience, anxiety. In contrast, if an avid mountain climber (i.e., high skill) climbs a mountain with minimal challenges in terms of incline and terrain (i.e., low challenge) he or she may experience boredom. However, if an individual participates in an activity with challenges that match his or her skill level (e.g., beginner chess player participating in a beginner tournament or avid mountain climber climbing Mount Everest), the experience is more likely to facilitate the experience of flow (i.e., an optimal experience). Additionally, if a person has just started to play tennis, ideally the first goal is to learn how to hold on to a racquet. As their skills become more developed and they have move on. Consequently, attempting to hit the ball over the net is a logical progression. However, if one does not know how to hold on to a racquet properly and attempts to hit the ball over the net, anxiety or frustration is likely to occur. There is an imbalance of likely to occur. Moneta and Csikszentmihalyi (1996) state that the theory of flow...
aClivity andor person-environment interaction need to be considered. There are many characteristics consistent with the theory or flow. These characteristics include 1) A balance of Challenge and Skills, 2) Complete Absorption in the Activity, 3) A Loss of self-Consciousness, 4) Clear Goals and Unambiguous Feedback, 5) Concentration on the Task at Hand, 6) Sense of Control, 7) Merging of Action and Awareness, 8) Autolelic experience and 9) Transformation of Time and Effortless Movement. Specifically, these activity. The following section will discuss these characteristics.

participation. anything external to the activity does not seem to matter and is considered irrelevant, complete absorption is apparent. This is known as Complete Absorption in the Activity. Specifically, the individual is completely absorbed in the activity and is only concerned with the present components of the activity itself. For example, an individual who is playing violin at a concert may become so absorbed in the activity that they are unaware of the audience to the point of being surprised when the audience applauds at the end of the musical piece. Additionally, the individual who has just learned to play tennis may enjoy the game so much that they are oblivious to the nearby noise of construction.
or other sounds due to this complete involvement. This characteristic is important for
without the fear of any distractions. Consequently, it is these activities that produce
immense amounts of enjoyment (Weinberg & Gould, 2003).

During the activity, concern for the self disappears during flow as the person
becomes one with the activity. This is known as the *Loss of Self Consciousness*
Specifically, there is no differentiation between the person participating in the activity or
the activity itself. The absence of preoccupation with the self does not mean the
individual is unaware of what is happening in their mind or body, but rather the
individual is not focusing on the information normally used to represent oneself who
one is (Jackson & Marsh, 1996); the individual is merely concerned with the activity they
are participating in. For example, the tennis player may become immersed in the
activity that they feel as though their racquet has become an extension of their own body.

This characteristic is important for exercise adherence in that participating in an activity
whole new journey of self-discovery as we become immersed in this deep psychological
condition (Csikszentmihalyi, 1990). Through this involvement, we are capable of
reaching needed depths as we discover ourselves further.

While participating in activities, individuals develop such a sense of control that
they are not actively aware of control (not thinking about the control present or lack of
control) nor are they concerned with lacking control. This is known as *Sense of Control*.
The thought of accomplishment or failure is not present and individuals are merely concerned with the participation in the activity. A sense of exercising control is experienced, without the person actively trying to exert control (Jackson & Marsh, 1996). For example, the tennis player is not concerned with their opponent but rather is just focused on hitting the ball in the desired spot. This characteristic is important for exercise merely enjoying participation. It is the ability to develop a sense of control in activities that is likely to result in superior performances and permit individuals to believe that they

While completely absorbed in the activity, the individual is aware of their own

Awareness. Involvement becomes so deep that it becomes spontaneous or automatic (Jackson & Marsh, 1996). It is a type of subconscious feeling that if it is made conscious can disrupt the experience as thoughts become diverted away from the task at hand. For example, when the tennis player is playing tennis, they do not need to consciously think about how to hit the ball as it appears to be a natural process. This characteristic is important for exercise adherence in that individuals are not preoccupied with their technique or form in an activity and are merely participating. It is at this point where the absorption is so prominent that actions in the activity appear to be spontaneous and they no longer view themselves as separate from the actions they are performing (Csikszentmihalyi, 1990; Weinberg & Gould, 2003)
in the amount of time spent in the activity. This is known as *Transformation of Time and

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for two hours when in fact they were only scheduled to play for an hour. This

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longer in an activity as opposed to watching the clock for the time pass by

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Complete concentration is critical while experiencing flow. This is known as

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irrelevant to the task is not processed, leaving only information relevant to the task at hand to be addressed. Consequently, total concentration is one of the most frequently

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is especially important in order to effectively complete an activity. For example, the

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the activity, such as the spectators. This characteristic is important for exercise adherence in that it permits the individual to fully focus on the activity in which they are participating and to dismiss everything external to it. It is the structure that this

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they possess particular traits. Specifically, the autotelic experience (or personality)
consists of a group of traits which are thought to facilitate intrinsic motivation in particular activities. Additionally, the autotelic trait encompasses concentration abilities, autonomy, self-confidence, an internal locus on control, a focus on process and challenge. Autotelic trait also tend to be internally driven and therefore participate in activities for intrinsic reasons. Additionally, individuals who possess the autotelic trait may be more likely to remain involved in exercise due to their intrinsic motivation.

As previously discussed during the Illow experience, the person perceives a balance between the challenges of a situation and one's skills, with both constructs operating at a personally high level (Jackson & Marsh, 1996). This is known as Challenge-Skill Balance. Csikszentmihalyi and Csikszentmihalyi (1988) describe this characteristic as occurring when a person's skill is at just the right level to cope with the situational demands. Consequently, individuals who do not possess the appropriate skills for the activity chosen will likely deem the activity meaningless and when an individual's skill level surpasses the activity that they are engaged in, their self and their potential cannot be realized. Additionally, this is also true when the characteristics of an activity surpass the individual's skill level. To clarify, one can assume that there are challenge-skill quadrants (See Figure 1). The vertical line represents challenges and the horizontal line represents skills. The top right quadrant represents the Illow state, the top left
quadrant represents anxiety. The bottom right quadrant represents boredom and the bottom left quadrant represents apathy. In activities where the challenge or the activity is high and so are the skills or the individual, we experience a sense of well-being such as flow. Keeping in line with the previous example, let us assume that an individual has just learned how to hit the tennis ball over the net. After practicing this skill a few times, he or she may progress to attempting to hit the ball over the net five times in a row and so on.

Since this activity is comparable with his or her skill level, the individual is likely to experience flow. In activities where the challenge or the activity is high and the skills or the individual are low, anxiety is likely to occur. Even though the individual has just learned to hit the ball over the net, attempting to put different kinds of spin on the ball may be quite difficult for the player and the individual would likely become frustrated and experience anxiety. In activities where the challenge or the activity is low and the skills are high, boredom is likely to occur. Since the tennis player has learned to hit the ball over the net, learning how to hold on to a racket again would be boring since they have already mastered that task. Additionally, in situations where neither skills nor challenges are present to a significant level, reeling or low energy levels and apathy is likely present and flow is not expected to occur (Jackson & Csikszentmihalyi, 1999, p. 37). This characteristic is important to exercise adherence in that the challenge or the activity in which an individual is participating must correspond with the skill level the individual possesses in order for a sense of well-being to occur. It is when the balance or challenges and skills are at an equilibrium that individuals are happy and stand flow experiences are imminent (Csikszentmihalyi, 1990; Weinberg & Gould, 2003).
although a low challenge and low skill situation can create a now experience, a true flow-like experience is evident when there is a match between high challenge and high skill involved. This characteristic can be applied to exercise adherence in that individuals may adhere more to exercise when they experience now during these activities, and now is more likely to occur in activities which meet individuals current skill level.

(Figure adapted from Weinberg & Gould, 2003 reprinted from Kimiecik & Stein, 1992)
characteristic can be applied to exercise adherence in individuals frequently establish
1996). Therefore, it is critical to develop a type of analysis which can accurately measure
low and its attributes. Although low is a subjective state, many studies have employed a
quantitative method of measurement in order to avoid limitations that are present during
qualitative research such as the retrospective nature of interviews (Karageorghis et al.,
2002). Among the most commonly used quantitative instruments are the Experience
(Csikszentmihalyi & LeFevre, 1989), the Flow Scale (developed by Jackson and
Marsh in 1996), the Privele Experience Questionnaire (developed by Bundrick, Privette
& Thornton in 1999) and the Dispositional Flow Scale (developed by Ford, Jackson,

The Experience Sampling Method (Csikszentmihalyi, Larson & Prescott, 1977) is
allleasforcollectinginformationaboutbolhthecontxiandconlent of the daily life of
individuals (Csikszentmihalyi et al., 2007). In a study that employs the Experience
Sampling Method, participants carry an electronic pager and Experience Sampling
Questionnaire booklet. Signals are sent to the pagers at random times throughout the day and participants are instructed to immediately fill out a section of the questionnaire pertaining to the physical context, social context, activities and thoughts and feelings.

This methodology has been used in several studies exploring the role of flow in sport (e.g., Fave & Massimini, 2003; Danielset al., 1995). For example, Danielset al. (1995) conducted a study to investigate the use of the Experience Sampling Method to measure flow among students enrolled in basketball activities. During a nine-week period, a research assistant would enter the gymnasium once a week and distribute activity to distribute the Experience Sampling Method questionnaires to participants. Upon completion of the questionnaires, participants resumed their activity. Results concluded students perceived the flow context to be the most enjoyable.

Additionally, Bassi et al. (2003) conducted a study to investigate the quality of experience and risk perception associated with high-altitude rock climbing by means of the Experience Sampling Method among six male rock climbers. Each climber carried an electronic pager that sent random signals five times a day for a week. Upon being signaled, climbers were asked to fill out a section of the Experience Sampling Method questionnaire which asked questions such as "What were you doing?" and "Please describe how you felt when you were beeped." Results concluded that climbing provided a potential source of flow and near-likes. In fact, flow was the most frequently
reported experience among the rock climbers. Additionally, according to the literature on the Experience Sampling Method literature by Csikszentmihalyi and Larson (1977), five signals a day for a standard one week session are effective in portraying participants daily.

The Flow State Scale provides a quantitative measurement of the eight dimensions of now outlined by Csikszentmihalyi (1990) in sport and physical activity settings. The 36-item instrument forms eight sub-scales which represent the dimensions of now. The dimensions measured include: 1) Challenge-Skill Balance, 2) Merging of Action and Awareness, 3) Clear Goals and Unambiguous Feedback, 4) Concentration on Taskal Hand, 5) Sense of Control, 6) Loss of Self-Consciousness, 7) Transfonnaion of Time and 8) Complete Absorption in the Activity. Statements were developed based on the eight dimensions of now (e.g. "I was challenged, but I believed my skills would allow me to meet the challenge" (Challenge-Skill Balance)) and respondents indicate the extent to which they agree with each statement on a 5-point Likert Scale (1 = "strongly disagree" and 5 = "strongly agree"). According to Jackson and Marsh (1996), The Flow State Scale has received initial psychometric support through confirmatory factor analyses, which confirmed the hypothesized nine-factor structure. Support was also demonstrated for a higher-order global factor; however, the fit of the data was slightly better for the nine-
Additionally, Jackson et al. (1998) conducted a study to examine possible psychological correlates of flow in a sample of 398 athletes participating in a World Masters Games open to all performers with no qualifying standards. Therefore, the skill level varied greatly as some participants were world-ranked competitors while others viewed themselves as recreational participants. The participants for this study were selected from four main sports: 1) swimming, 2) triathlon, 3) cycling and 4) track and field. In addition to using the Flow State Scale to assess the athletes, the Trait Flow Scale, based on Jackson and Marsh's Flow State Scale which is designed to assess the trait component of flow, was used during this study. Specifically, the Trait Flow Scale assesses the frequency with which respondents report experiencing flow in general during sport participation. Results concluded that relationships exist between flow and perceived sportability, anxiety, and an intrinsic motivation variable.

peak performance, defined operationally as "functioning at your best" (Bundrick et al., 1999, p.5 & Privette, 1999). This questionnaire contains 47 descriptive items/questions in a Likert-type format. In addition, the questionnaire was developed based on unstructured self-reports and literature concerning peak experience, peak performance and flow. The Privette Experience Questionnaire has been used in several studies examining the experience of flow. For example, Grove and Lewis (1996) conducted a study to examine
the hypnotic susceptibility and priorexperience as correlates of flow-like states during exercise by means of the Privette Experience Questionnaire among 96 participants who regularly attended circuit training classes at a university gymnasium. A subset of items was derived from the Privette Experience Questionnaire in order to assess the flow-like states. Participants completed the ten item flow questionnaire on two different occasions as they moved to other exercises. Participants were then instructed to assess their heart rate each time they answered dimensions of the flow scale. Results concluded that flow-like states were apparent during circuit training. Psychometric studies (Privette & Bundrick, 1987) supported reliability and construct validity and provided an

The Dispositional Flow Scale measures a particular individual's dispositional propensity to experience flow (Boric, 2005 & Jackson & Marsh, 1996). It consists of 36 items based on the eight dimensions of flow cited by Csikszentmihalyi (1990) to measure the frequency in which individuals distinguish experiences in flow in a particular activity. The Dispositional Flow Scale is based on a previous validation of Jackson and Marsh's (1996) Flow State Scale which measures flow experiences in a particular activity. Items on the Dispositional Flow Scale are based on a 5-point Likert Scale varying from "1" (never) to "5" (always). An example of a question assessing Challenge-Skill Balance is as follows: "I am challenged but I believe my skills will allow me to meet the challenge."
Additionally, each subscale is measured by four items (Jackson et al. 1998). Wanneret al. (2006) conducted a study to examine whether flow and dissociation were experienced across sports, recreational and pathological gambling in a sample of 511 college students.
concluded that describing flow is a relational performance which requires the use of

Flow and motivation have long been studied together. As both are crucial

participants versus sedentary participants
Research indicates that individuals often experience flow while participating in sport and physical recreational activities. The experience of flow has been found to be present in several sport and physical recreation contexts including netball (Fryer et al., 2002), swimming (Fortier & Kowal, 1999), basketball (Danielson et al., 1995), climbing (Bassi et al., 2003), circuit training (Grove & Lewis, 1996), sports at the World Masters Games (Ford et al., 1998) and canoeing (Sparkes & Partington, 2003). For example, Ford et al., (1998) concluded that perceived sport ability had the most substantial correlations with flow. Moreover, Bassi et al., (2003) concluded that climbing provided a great potential source for optimal experience. All in turn, flow. Specifically, the flow state was among the most commonly reported states among the climbers during the expedition. Grove and Lewis (1996) reported that participants involved in circuit training did experience flow and that the flow states generally increased as the exercise was prolonged. Particularly, participants who had more than six months of circuit training reported the most flow-like experiences. Finally, Sparkes and Partington (2003) concluded that flow experiences were imminent among the canoeists and that describing
flow is a relational performance which is primarily shaped by storytelling of the participants. However, the main purpose of these studies was not to determine whether participants experienced flow while participating in the sport or physical recreation activity, but to determine predictors and correlates of flow.

Within the context of flow and sport, research has primarily focused on the determinants of the flow experience. For example, sport psychologists have been interested in studying interventions that may increase the experience of flow and subsequently performance. For example, FTyer et al. (2002) concluded that music interventions induced the flow state among some netball players. However, flow states were not always consistent with changes in performance. Nevertheless, flow was present among the players following the music intervention. Various psychological determinants associated with motivation theories including intrinsic motivation, perceived ability, and enjoyment. In Fortic and Kowals' (1999) study, they found that swimmers who participated in their activity for their own benefit experienced the highest amount of perceived sport ability had the most substantial correlations with flow. Finally, Dallielset al., (1995) concluded that the basketball players found the flow context to be the most enjoyable and they reported having the most control in the flow state.

Some research suggests that individuals are more likely to experience flow while participating in sports and recreation compared to other types of activities that require
less skill and challenge. For example, a study conducted by Delespaul et al. (2004) explored the contextual and subjective determinants of flow with regards to activation in studying, and compared this with sports and watching television or listening to the radio. Forty-three undergraduates completed the Experience Sampling Method questionnaire and at various moments 10 times a day. Students valued the social highest activation levels and lowest activation was associated with passive leisure when

but low in perceived skills, sports was challenging and unrelated to skills and watching television or listening to the radio was low in challenges but high in skills. Therefore, the characteristics of engaging in an activity are intricate and are related to contemporaneous emotions and context. Despite the body of research examining the experience of flow in sports and recreation, there has been no research that has applied the theory of flow in an

The previous literature review has provided much information on various theories of exercise adherence, factors of motivation and the theory of flow. Although it is evident that motivation plays a vital role in exercise adherence, there has yet to be a study to determine the relationship between exercise adherence, motivation and flow. As previously stated, it has been suggested that highly motivated individuals experience high
consistently found to have a positive association with physical activity (Dishman &
This study attempted to determine if relationships existed among exercise adherence.

(1) Is there a relationship between now experienced by exercise participants' motivation to exercise, and exercise adherence? (2) To what extent is flow associated with exercise adherence?; and (3) What are the differences (if any) in flow experienced and motivation.

Participants in this study consisted of (1) individuals who were members of various fitness and recreation complexes and groups throughout St. John's and (2) students attending Memorial University. The aim was to recruit individuals with a variety of physical activity levels ranging from being physically inactive to being very physically active. In order to be eligible to participate in this study, participants had to be 19 years of age or older. A purposive sampling technique, in which an expert uses judgment in selecting cases with a specific purpose in mind, was employed to collect data from participants in various recreation complexes throughout St. John's as well as students attending Memorial University (Neuman, 2007, p.142). The intent was to accumulate
approximately 100 participants for this study. To recruit participants from fitness and recreation complexes and groups. I contacted the complex and groups to request permission to distribute questionnaires. When permission was obtained, I then distributed interested in completing the survey. Participants had the opportunity to either 1)
regarding factors of exercise adherence. Additionally, participants completed a questionnaire containing socio-demographic information regarding age, date of birth, gender, education, income, and employment status as the socio-demographic variables in this study. Exercise adherence was the dependent variable in the proposed study, defined as the ability and dedication an individual has in adhering to a particular exercise regime. According to the Public Health Agency of Canada (2011), adults (age 18-64) should be active 2.5 hours a week to achieve health benefits. Exercise adherence, conceptualized as level of physical activity, was measured using the Baecke Questionnaire of Habitual Physical Activity (Baecke et al., 1982). This questionnaire consists of 16 questions that separate physical activity into 3 distinct domains: (1) Work Physical Activity (Work PA), (2) Sport Physical Activity (Sport PA) and (3) Non-sports leisure (Leisure PA). Participants are asked to respond to statements using a 5-point Likert-type scale; with the exception of a couple of statements related to types of sports played. The Work PA domain consists of 8 statements: 1) one statement is related to main occupation as categorized by amount of physical activity associated with the occupation (1 = low activity occupations such as studying and office work; 5 = high activity occupations such as construction work); and 2) seven statements related to frequency of sitting, standing, walking, lifting, and sweating during hours of work. A
The SportPA domain consists of four self-report questions related to participation in sport. The set of questions is not on the index. Participants are first asked whether or not they play a sport. If the participant does play a sport, then they are asked to indicate their two most frequently played sports (open-ended question), the amount of time per week that the sports are played « 1 hour (weighted score of 0.5), 1-2 hours (weighted score of 1.5), 2-3 hours (weighted score of 2.5), 3-4 hours (weighted score of 3.5), >4 hours (weighted score of 4.5) and the proportion of the year in which the sports are played regularly « 1 month (weighted score of 0.04), 1-3 months (weighted score of 0.17), 4-6 months (weighted score of 0.42), 7-9 months (weighted score of 0.67), >9 months (weighted score of 0.92). Based on the type of sport indicated, the research determines the intensity of sport in terms of average energy expenditure (Baek et al.).

Energy expenditure of 0.76 MJ/h (e.g., bowling, golf); 2) middle intensity sports with an average energy expenditure of 1.26 MJ/h (e.g., dancing, badminton, swimming, tennis); and 3) high intensity sports with an average energy expenditure of 1.76 MJ/h (e.g., basketball, rowing, rugby). A sport intensity item is then calculated based on summing the product of the intensity, time, and proportion questions for both sports. Subsequently, this is then translated into a 5-point Likert scale (2: 12 = 5; 8 to < 12 = 4; 4 to < 8 = 3; 0 to < 4 = 2; 0 = 1). Next, participants are asked to respond to three statements: 1) "In comparison to others my own age I think my physical activity during leisure is.. ." (I = Much less; 5 = Much more); 2) "During leisure time I sweat" (I = never; 5 = very often); and 3) "During leisure time I play sports" (I = never; 5 = very often). A SportPA index is
calculated as a mean score among these 4 items and thus scores can range from 0 to 5. A Leisure PA index is calculated as a mean score among these 4 items and thus scores can range from 0 to 5. A total physical activity score is calculated as the sum score of the three indices thus allowing a total score from three (minimum) to fifteen (maximum). According to Hertogh et al. (2008), the validity of the Modified Baecke Questionnaire is fair-to-moderate. It was also determined that the questionnaire can correctly classify individuals as low or high active, but does a poor job for moderately active individuals. The construct validity of the questionnaire has been assessed in comparison to doubly labeled water, which is considered the gold standard measure in terms of energy expenditure: the total activity index of the Baecke yielded correlation coefficients of .68 against doubly labeled water (Philippaerts et al., 2001). Other investigators have also found good construct validity for the Baecke when compared to the doubly labeled water technique (p = 0.54; Hertogh et al., 2008). The scale has proven to have good test-retest reliability; indicating good reproducibility after 5 and 11 months among men and women aged 20-70 years (Pols et al., 1995). Test-retest correlation coefficients ranged between .65 and .89, and relative validity was assessed by comparing the questionnaire to a full-time repeated 3-day activity diary with correlations of .56 among men and .44 among women (Pols et al., 1995).

Flow and motivation were the independent variables in this study. Flow is defined as a very positive psychological state that typically occurs when a person perceives a balance between the challenges associated with a situation and his or her capabilities to
accomplish or meet these demands (Csikszentmihalyi, 1990). Jackson and Marsh (1996) developed the Flow State Scale, which measures people’s level of flow in a specific activity. The Flow Trait Scale (Jackson et al., 1998) was developed as a parallel trait version of this state instrument. The theory of flow states that the autotelic personality can explain why some people are more likely to experience flow than others. Thus the Flow Trait Scale was developed using the same items that are reworded to assess participant’s dispositional assessment of the dimensions of flow in relation to their general experiences rather than an assessment of flow in relation to a specific experience. The Flow Trait Scale was subsequently renamed the Dispositional Flow Scale.

Modifications were made to this original version in order to improve the measurement of some of the flow dimensions resulting in the current version called the Dispositional Flow Scale-2 (Jackson et al., 2002). This scale consists of 36 items based on the nine dimensions of flow cited by Csikszentmihalyi (1990) to measure the frequency of flow experiences in a chosen physical activity and in general. It consists of nine subscales: Challenge-Skill Balance (e.g., “I am challenged but I believe my skills will allow me to meet the challenge”), Clear Goals (e.g., “I know clearly what I want to do”), Unambiguous Feedback (e.g., “I am aware of how well I am performing”), Sense of Control (e.g., “I feel in total control of what I’m doing”), Autotelic (e.g., “I love the feeling of that performance and want to capture it again”), Merging of Action and Awareness (e.g., “Things seem to be happening automatically”), Concentration on the Task at Hand (e.g., “My attention is focused entirely on what I am doing”), Transformation of Time (e.g., “The way time passes seems to be different from nonnal”) and Loss of Self-
Consciousness (e.g. "I am not concerned with what others may be thinking of me") Items are rated on a 7-point Likert Scale varying from "1" (never) to "7" (always), with high values indicating more flow. Subscales are computed by the average of the four respective items. A total scale score is obtained by summing the item-averaged dimension scores. The Dispositional Flow Scale-2 demonstrates good construct validity in the form of its factor structure and acceptable internal consistency with alpha levels on the subscales ranging from .78 to .92 (Marsh & Jackson, 1999; Jackson & Eklund, 2002; Jackson et al.,

Intrinsically motivated activities are defined as activities that individuals find interesting and would participate in the absence of operationally separable consequences (Deci & Ryan, 2000). Contrarily, extrinsic motivation is defined as the performance of particular activities in order to attain a separable outcome (Ryan & Deci, 2000).

Motivation to be physically active was measured using the Motives for Physical Activities Measure-Revised (Ryan et al., 1997) which determines reasons for participating in particular exercise activities. This scale is a revision of the Motives for Physical Activity Measure (Frederick & Ryan, 1993) and it was based on pilot testing of items (factor analysis and construct studies) on two different samples. The scale consists of 30 items which form five general motive subscales for participation in an activity: Interest/Enjoyment (7 items; e.g., "Makes me happy"), Competence (7 items; e.g., "Like physical challenges"), Appearance (6 items; e.g., "To define muscles, look better"), Fitness (5 items; e.g., "To improve cardiovascular fitness") and Social (5 items; e.g., "To be with others inactivity"). Each of these items is rated on 7-point Likert scales. The
items range from "\"" (not at all true for me) to "7" (very true for me) with higher scores indicating a higher level of truth with the specific statement. Subscale scores are and validity of the factors demonstrates a clear factor structure of the scale items. Internal consistencies (alphas above .87 for each subscale) and differences in relations with both choice of sport/exercise activities and associated outcomes (Fredrick & Ryan, 1993):

All participants were provided with an identification code (i.e., no identifying and analyzed in SPSS 7.0. First, data was screened for missing and invalid data points. and assumptions for performing parametric tests were tested. Descriptive statistics were conducted on socio-demographic and study variables. Next, correlations were conducted to determine bivariate and partial correlations between exercise adherence, motivation, and Oow. Finally, a series of multiple regressions and analysis of variance models were conducted in order to determine 1) the relationship between now experienced by exercise participants, motivation to exercise, and exercise adherence, 2) the extent to which Oow is associated with exercise adherence, and 3) to identify differences in now experienced and motivation to exercise among active versus sedentary participants.
The nature of this study was non-threatening and posed minimal risk to the participants involved. The danger existed in that a survey question may have triggered unpleasant memories and generally negative emotions for the participants. However, the questions posed likely did not cause any negative feelings for the participants. Due to the fact that participants in this study were required to complete three questionnaires, the time dedication may have resulted in a stressful response. Although this study did not pose much harm, it also did not pose many benefits either. During the completion of certain questionnaires, participants may have acquired new information about their participation in physical activity and may or may not have changed their participation habits based on this information. Since all participants in this study were 19+ years of age, compliance was assumed. Additionally, participants volunteered to complete a survey. Participants were also told that their participation was voluntary and that if they decided not to complete the questionnaires, there were no repercussions, penalty, or harm. Participants were permitted to withdraw from the study at any time. In addition, confidentiality and anonymity of the participants and their information was ensured. Participants were also told that their information would not be used for any other purpose other than for the study and that their information would be kept in a locked cabinet throughout the research process. Upon completion of the research, data will be erased or
The following chapter will discuss the results of the study. Sampled descriptors will be discussed proceeded by correlation results of flow, physical activity, and motivation. Regression results are presented which determined the association between variables. Finally, a series of independent t-tests are presented which determined differences in the experience of flow and motivation among active versus less active.

There were 100 (n = 100) participants in this study who ranged in age from 19-58 (M = 27.8; SD = 9.05). Moreover, 80% (n = 80) were female and 20% (n = 20) were male. Sixty-eight percent (n = 68) of participants reported being a student while 30% (n = 30) were not students. Fifty-seven percent (n = 57) were employed full-time, 32% (n = 32) were employed part-time, 8% (n = 8) were unemployed/homemakers, and 1% (n = 1) a high school certificate or equivalent. 38% (n = 38) had some post-secondary education (post-secondary not completed). 15% (n = 15) had an associate's degree or diploma from a community college or trade school. 34% (n = 34) had a university degree and 9% (n = 9) had obtained a graduate degree. With regard to annual household income, 19% (n = 19) of participants reported less than $10,000. 14% (n = 14) reported $0.00-$19,999. 100% (n = 100)
Exercise adherence, conceptualized as level of physical activity, was measured using the Baecke Questionnaire of Habitual Physical Activity (Baecke, Burema & Frijters, 1982). This questionnaire consists of 16 questions that separate physical activity into 3 distinct domains: (1) Work Physical Activity (Work PA), (2) Sport Physical Activity (Sport PA), and (3) on-sports leisure (Leisure PA). The Work PA domain amount of physical activity associated with the occupation (1 = low activity occupations such as studying and office work; 5 = high activity occupations such as construction work). In terms of intensity of participants' occupation, 91% (n = 91) people were classified as low intensity, 8% (n = 8) as middle intensity and 1% (n = 1) people were classified as high intensity. Additionally, seven statements related to frequency of sitting, standing, walking, lifting and sweating during hours of work were provided (see Table 1) scores can range from 1 to 5. The means of the Work PA statements were as follows. With regards to the question "What is your main occupation?..? M = 1.2. In terms of the question "A work I sit?", M = 3.9. With respect to the question "A work I stand", M =
2.9. With regards to the question "At work I walk", $M = 3.0$. In terms of the question "At work I lift heavy loads", $M = 2.0$. With respect to the question "After work I am tired", $M = 2.9$. In terms of the question "At work I sweat", $M = 2.0$. With regards to the question "In comparison to others of my own age I think my work physical activity is much heavier, etc"., $M = 1.9$. This population had a mean Work PA score of $1.76$ ($SD = .40$; $z_{skewness} = 3.71$; $z_{kurtosis} = 2.19$) indicating that as a whole, the respondents did not receive much physical activity.

Table I: Descriptive Statistics for Work Physical Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>At work I sit</td>
<td>3.9(.98)</td>
<td>-4.48</td>
<td>2.26</td>
</tr>
<tr>
<td>At work I stand</td>
<td>2.9(.99)</td>
<td>0.65</td>
<td>-1.01</td>
</tr>
<tr>
<td>At work I walk</td>
<td>3.0(1.02)</td>
<td>0.73</td>
<td>-1.01</td>
</tr>
<tr>
<td>At work I lift heavy loads</td>
<td>2.0(1.03)</td>
<td>4.51</td>
<td>1.62</td>
</tr>
<tr>
<td>After work I am tired</td>
<td>2.9(1.03)</td>
<td>-0.90</td>
<td>0.33</td>
</tr>
<tr>
<td>At work I sweat</td>
<td>2.0(.91)</td>
<td>2.82</td>
<td>0.27</td>
</tr>
</tbody>
</table>

In comparison of others of my own age I think my work physical activity is much lighter.

a 1 = never; 5 = always
b 1 = much lighter; 5 = much

The SportPA domain consisted of four sets of questions related to participation in sport/physical activity. Inety-nine percent ($n = 99$) people reported participating in sport/physical activity or exercise in comparison to 1% ($n = 1$) people who did not participate in physical activity. According to the Baecke Questionnaire of Habitual Physical Activity (Baecke et al., 1982), participants' activities were classified into ten settings.
Of the most frequently participated activity reported by participants, 6% (n = 6) were classified as low intensity. 74% (n = 74) were classified as middle intensity and 20% (n = 20) were classified as high intensity. Furthermore, 21% (n = 21) participated in running. 31% (n = 31) participated in hiking/walking. 20% (n = 20) were classified as participating in cardio/weights/gym. 3% (n = 3) participated in yoga/pilates. 6% (n = 6) participated in aerobics and 13% (n = 13) participated in individual sports/activities. On average, participants reported participating in the most frequently participated physical activity 3-4 hours per week during 7-9 months of the year. Of the second most participated activity, 7% (n = 7) were classified as low intensity. 76% (n = 76) were classified as middle intensity and 13% (n = 13) were classified as high intensity. With regards to the type of physical activity that was stated as the second most participated activity, 8% (n = 8) of participants participated in running. 17% (n = 17) participated in hiking/walking. 26% (n = 26) participated in cardio/weights/gym. 4% (n = 4) participated in yoga/pilates, 15% (n = 15) participated in competitive sports, 8% (n = 8) participated in aerobics and 18% (n = 18) participated in individual sports/activities. On average, participants reported participating in their second most frequently participated physical activity 1-2 hours per week during 4-6 months of the year. A sport intensity item was then calculated based on summing the product of the intensity, time, and proportion questions for both sports and translated into a 5-point Likert scale. On average, the sample had a sport intensity score of 3.0 ($SD = .72$) indicating that they were moderately physically active. Next, participants were asked to respond to 3 statements: 1)
In comparison to others my own age I think my physical activity during leisure is... (1 = Much less; 5 = Much more); 2) “During leisure time I sweat” (1 = never, 5 = very often); and 3) “During leisure time I play sports” (1 = never, 5 = very often). In comparison to others their own age, participants report being about the same amount of physical activity during leisure time (M = 2.5, SD = 1.07; zskewness = 1.51; zkurtosis = -1.34). Participants often sweated during their physically active leisure time (M = 3.59, SD = 1.01; zskewness = 1.30; zkurtosis = -0.45). Finally, participants often played sports during their leisure time (M = 3.66, SD = .97; zskewness = -0.94; zkurtosis = -1.23). A Sport PA index was calculated as a mean score among these 4 items and thus scores could range from 1 to 5. This sample had a mean Sport PA score of 3.18 (SD = 0.41; zskewness = -1.44; zkurtosis = 0.06) indicating that as a whole, the respondents were moderately active during their leisure time.

Leisure PA deals with questions with regards to mode of transport to and from school and work, and frequency of television watching, walking, and cycling. Participants responded to four statements related to frequency of watching television and walking and cycling during leisure time (i.e., active transportation) as well as the number of minutes of non-walking and non-cycling physical activity per day from work, school, and shopping (see Table 2). A Leisure PA index was calculated as a mean score among these 4 items and thus scores could range from 1 to 5. This sample had a mean Leisure PA score of 1.27 (SD = 0.56; zskewness = 0.40; zkurtosis = -1.25) indicating that as a whole, the respondents were not very physically active during their leisure time. Finally, a total physical activity score was
(minimum) to fifteen (maximum). On average, participants had a mean physical activity score of 6.23 (SD = .93) and this variable was not significantly skewed (z_{skewness} =

Table 2: Descriptive Statistics for Leisure Physical Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>During leisure time I walk</td>
<td>3.2 (1.01)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>During leisure time I cycle</td>
<td>1.8 (1.03)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Minutes/day walking/</td>
<td>2.9 (1.38)</td>
<td>0</td>
<td>-2.55</td>
</tr>
<tr>
<td>cycling to and from work/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>school/shopping</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
^a 1 = \text{never}; 5 = \text{very often} \\
^b 1 = <5 \text{ minutes}; 2 = 5-15 \text{ minutes}; 3 = 15-30 \text{ minutes}; 4 = 30-45 \text{ minutes}; 5 = >45 \text{ minutes}
\]

Flow was operationalized in this study using the Dispositional Flow Scale (2) (Jackson et al., 2002). This scale consists of 36 items based on the nine dimensions (4 items per sub-scale) of flow cited by Csikszentmihalyi (1990) to measure the frequency of flow experiences in chosen physical activity in general. It consists of nine subscales: 1) Challenge, 2) Skill Balance, 3) Clear Goals, 3) Unambiguous Feedback, 4) Sense of Control,
5) Autotelic, 6) Merging of Action and Awareness, 7) Concentration on the Task at Hand, 8) Transformation of Time and 9) Loss of Self-Consciousness. Subscales are computed by the average of the four respective items. Please refer to Table 3 for the descriptive statistics of the items and sub-scales. The most frequently experienced now items include “I know what I want to achieve” ($M = 4.1; SD = .80$), “I have a sense of control over what I am doing” ($M = 4.1; SD = .71$), “I really enjoy the experience of what I am doing” ($M = 4.1; SD = .74$), “The experience leaves me feeling great” ($M = 4.1; SD = .81$), and “The experience is extremely rewarding” ($M = 4.1; SD = .81$). In terms of the frequency of the experience of the nine dimensions now, the sample, on average, reported them in the following rank order (highest to lowest): 1) Autotelic, 2) Clear Goals, 3) Sense of Control, 4) Challenge-Skill Balance, 5) Unambiguous Feedback, 6) Merging of Action and Awareness, 7) Concentration on the Task at Hand, 8) obtained by summing the item-average dimension scores (1 = no experience of now; 45 = frequent experience of now). On average, this sample experienced a mean Total Flow score of $32.9$ ($SD = 4.21$; $z_{skewness} = -1.35$; $z_{kurtosis} = .94$) indicating that participants experienced moderate levels of now during their most frequently participated physical.
I am challenged but I believe my skills will allow me to meet the challenge.

I do things spontaneously and automatically without having to think.

I have a good idea about how well I am doing while I am involved in the task/activity.

I can tell by the way things are progressing how well I am doing.
Motivation to be physically active was measured using the Motives for Physical Activities Measure-Revised (Ryan et al., 1997) which determines reasons for participating in particular exercise activities. The scale consists of 30 items which form 5 general motives sub-scales for participation in an activity: Interest/Enjoyment (7 items), Competence (7 items), Appearance (6 items), Fitness (5 items) and Social (5 items). Each of these items is rated on a 7-point Likert scale. The items range from "1" (not at all true for me) to "7" (very true for me) with higher scores indicating a higher level of truth with the specific statement. Sub-scores are calculated as the mean scores of all items within each sub-scale. Please refer to Table 4 for the descriptive statistics of the items and sub-scales. The most frequently experienced motivation items included "Because I want to be physically fit" ($M = 6.3; SD = 1.03$), "Because I want to maintain my physical health and well-being" ($M = 6.3; SD = 1.11$), "Because I want to have more energy" ($M = 6.2; SD = 0.81$), "Because I want to maintain my physical strength and live a healthy life" ($M = 6.1; SD = 0.89$) and "Because I make myself happy" ($M = 6.1; SD = 1.08$). The rank order (highest to lowest) of the motivation sub-scales for this sample was as follows: 1)
Fitness, 2) Interest/Enjoyment, 3) Appearance, 4) Competence, and 5) Social. The total motivation score was calculated by summing the item-averaged dimensions scores. On average, this sample experienced a mean Total Motivation score of 26.9 (SD = 4.18; $z_{\text{skewness}} = -0.65; z_{\text{kurtosis}} = -1.01$) indicating that on average participants reported a moderate level of motivation to participate in physical activity.

Table 4: Descriptive Statistics of Motives for Physical Activities Measure-Revised Scale

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Because I like engaging in activities that physically challenge me
Because I want to maintain my physical strength to live a healthy life.

Because I want to maintain my physical health and well-being.
In order to measure the strength of the relationship between socio-demographic variables (gender and age) to physical activity (work physical activity, sport physical activity, leisure physical activity, and total physical activity) now (Total Flow and subscales: Challenge-Skill Balance, Merging of Action and Awareness, Clear Goals, Unambiguous Feedback, Concentration on the Task, Hand, Sense of Control, Loss of Self-Consciousness, Transformation of Time and Autotelic Experience) and motivation (total motivation and subscales: Interest, Enjoyment, Competence, Appearance, Fitness and Social), a series of Pearson correlation coefficients were conducted.

Gender was significantly positively associated with work physical activity ($r = 0.266, p < .05$; small effect: $r = 0.017$) meaning that males experienced higher work physical activity levels. In terms of the experience of flow, gender had a small ($r = 0.013$) but significant and positive relation with Challenge/Skill Balance ($r = 0.250, p < .05$) suggesting that males participate in physical activity where the challenge meets their current skill level. Males also reported greater scores of Total Flow in comparison to females ($r = 0.209, p < .05$; large effect: $r = 0.043$). In terms of motivation, gender was significantly positively related with Interest/Enjoyment ($r = 0.273, p < .01$) and Competence ($r = 0.349, p < .001$); however, the effects were small. This suggests that males participate in physical activity for their own interest/joyment and to improve on their own knowledge/skill base. Finally, gender was also significantly positively
significantly negatively associated with the Social motivation sub-scale \( r = -0.210, p < 0.05 \) (large effect: \( r = 0.040 \)) suggesting that as education increased, the conception of participating in physical activity for social purposes decreased. Finally, contrary to the belief that higher rates of exercise behaviour have been correlated with increased socioeconomic standing (Rhodes et al., 1999, p. 399), income was not significantly

Physical Activity (Work PA), Sport Physical Activity (Sport PA), Leisure Physical Activity (Leisure PA), and Total Physical Activity (Total PA). Total PA scores were significantly positively associated with Work PA \( r = 0.515, p < 0.001 \) (small effect: \( r < 0.001 \)), Sport PA \( r = 0.716, p < 0.001 \) (small effect: \( r < 0.001 \)) and Leisure PA \( r = 0.757, p < 0.001 \) (small effect: \( r < 0.001 \)) meaning that people with high levels of work, sport and leisure physical activity also had high levels of total physical activity. Sport PA was significantly positively associated with Leisure PA \( r = 0.289, p < 0.01 \) (small effect: \( r = 0.04 ) suggesting that people who are physically active in sport are also physically active
In terms of the relation between physical activity and the flow sub-scales, Sport PA was significantly positively associated with ClearGoals ($r = .223, p < .05$; medium effect $r = .027$) and Aesthetic ($r = .234, p < .05$; medium effect $r = .021$) suggesting that clear goals are clearly evident in higher levels of sport physical activity, conceivably due to the highly competitive nature of sports, as well as signifying the highly psychological aspect of sports. In contrast, Leisure PA was significantly negatively associated with Merging of Action and Awareness ($r = -.214, p < .05$; medium effect $r = .034$) and with associations suggesting that since leisure physical activity is generally participated in at a low intensity, one cannot reach optimal psychological levels which result in total immersion in the activity. Additionally, due to the less intense nature of leisure physical

In terms of the relation between physical activity and motivation sub-scales, Work PA was not significantly associated with motivation. Sport PA ($r = .282, p < .01$; small effect $r = .034$) and Total PA ($r = .281, p < .05$; small effect $r = .01$) were significantly positively associated with the Interests-Enjoyment motivation subscale suggesting that people participated in sport for their own satisfaction and that people generally participated in physical activity for their own pleasure. Similarly, Sport PA ($r = .361, p$
were significantly positively associated with the Competence motivation subscale suggesting that higher levels of competence are associated with sport participation and that people partake in physical activity to further develop their pre-existing skills, qualities, etc. Finally, Sport PA was also significantly positively associated with the Fitness motivation subscale (r = .214, p < .05; medium effect: r = .034). Sport PA was the only form of physical activity that was significantly positively associated with Total Motivation (r = .299, p < .01; small effect: r = .004) suggesting that people tend to be motivated the most in sport participation compared to work or leisure physical activity significantly positively associated with all nine dimensions of flow: Challenge-Skill Balance (r = .760, p < .001; small effect: r < .001); Merging of Action and Awareness (r = .638, p < .001; small effect: r < .001); Clear Goals (r = .734, p < .001; small effect: r < .001); Unambiguous Feedback (r = .789, p < .001; small effect: r < .001); Concentration on the Task at Hand (r = .754, p < .001; small effect: r < .001); Sense of Control (r = .807, p < .001; small effect: r < .001); Loss of Self-Consciousness (r = .433, p < .001; 001); and Autotelic (r = .693, p < .001; small effect: r < .001).

In terms of correlations among the flow subscales, the Challenge-Skill Balance dimension of flow was significantly positively associated with five other dimensions of
Oow: Merging of Action and Awareness Total ($r = .443, p < .001$; small effect: $r < .001$); Clear Goals Total ($r = .585, p < .001$; small effect: $r < .001$); Concentration on the Task at Hand ($r = .643, p < .001$; small effect: $r < .001$); Sense of Control ($r = .549, p < .001$; small effect: $r < .001$); and Autotelic ($r = .583, p < .001$; small effect: $r < .001$).

In addition to the positive association with the Challenge-Skill Balance dimension, the Merging of Action and Awareness sub-scale was significantly positively associated with all other Oow dimensions: Clear Goals ($r = .323, p < .01$; small effect: $r < .001$) suggesting that people become immersed in an activity when they have goals set; Unambiguous Feedback ($r = .454, p < .001$; small effect: $r < .001$) meaning that people may become immersed in an activity when they are aware of how they are attaining their goals; Concentration on the Task at Hand ($r = .325, p < .01$; small effect: $r < .001$) suggesting that when people become immersed in an activity, they may have higher control; Loss of Self-Consciousness ($r = .302, p < .01$; small effect: $r < .002$) suggesting that as people become immersed in an activity, they have less negative thoughts and uncertainties; Transcendence of Time ($r = .286, p < .01$; small effect: $r < .004$) meaning that as people become immersed in an activity, time seems to slow down or speed up; and Autotelic ($r = .328, p < .01$; small effect: $r < .001$) suggesting that as people become immersed in an activity, they may have higher control.

In addition to its positive association with the Challenge-Skill Balance and Merging of Action and Awareness dimensions of Oow, the Clear Goals subscale was also
significantly positively associated with Unambiguous Feedback \( (r = .789, p < .001; \text{small effect: } r < .01) \) and Concentration on the Task at Hand \( (r = .560, p < .001; \text{small effect: } r < .001) \) meaning that people who established goals for an activity had higher levels of

signifying that people may feel more in control in an activity when they have goals set and Autotelic Total \( (r = .530, p < .001; \text{small effect: } r < .001) \). The Unambiguous Feedback dimension of flow was significantly positively associated with Concentration on the Task at Hand \( (r = .557, p < .001; \text{small effect: } r < .001) \) meaning that people may experience higher concentration levels when they are aware of how they are doing; Sense of Control \( (r = .652, p < .001; \text{small effect: } r < .001) \) suggesting that people may feel more in control when they are aware of how they are doing; Transformation of Time \( (r = .331, p < .01; \text{small effect: } r < .001) \); and Autotelic \( (r = .429, p < .001; \text{small effect: } r < .001) \) meaning that people who experienced intrinsic enjoyment in an activity also experienced high

of Self-Consciousness \( (r = .234, p < .05; \text{medium effect: } r = .02) \) meaning that people who experienced total control in an activity may have also been free of negative thoughts.
about their selves; Transformation of Time (r = .274, p < .01; small effect: r = .006) suggesting that people who experience total control in an activity also feel that time is altered; and Alltotelic 1 (r = .510, p < .001; small effect: r < .001) suggesting that people who experience total control may also experience intrinsic enjoyment in the activity.

Finally, the Transformation of Time flow subscale was significantly positively associated with Autotelic (r = .274, p < .01; small effect: r = .006) suggesting that people who experience an alteration in time in physical activity are also experiencing intrinsic enjoyment.

was not significantly associated with the Appearance or Social motivations subscales;

Interest/Enjoyment (r = .517, p < .001; small effect: r < .001) suggesting that people with high levels of flow also participated in physical activity for their own interest;

Competence (r = .489, p < .001; small effect: r < .001) suggesting that people with high levels of flow may also participate in physical activity for their own benefit; and Fitness (r = .216, p < .05; medium effect: r = .037) meaning that people with high level of flow may also participate in physical activity for fitness reasons. Total Flow and Total Motivations scores were significantly positively associated (r = .358, p < .01; small effect: r = .001) suggesting that people with high level of flow also experience high level of
In terms of correlations among the flow subscales, the Challenge-Skill Balance dimension of flow was significantly positively associated with the Interest-Enjoyment motivations subscale ($r = .517, p < .001; \text{small effect}: r < .001$) suggesting that people will generally select activities that match their current skill level which in turn promotes enjoyment; Competence ($r = .608, p < .001; \text{small effect}: r < .001$) implying that people are likely more competent in their activity participation when their skills meet the challenge of the activity; and the Fitness subscale ($r = .359, p < .001; \text{small effect}: r < .001$) signifying that people want to become physically fit in activities that match their current skill level. The Challenge-Skill Balance dimension of flow was not associated with the Appearance or Social motivations subscales. Merging of Action and Awareness was significantly positively associated with Interest-Enjoyment ($r = .317, p < .01; \text{small effect}: r = .002$) signifying that when people become immersed in activity, they may experience greater enjoyment; and Competence ($r = .287, p < .01; \text{small effect}: r = .004$). The Merging of Action and Awareness dimension of flow was not associated with Appearance, Fitness or Social motivations subscales. The Clear Goals dimension of flow was significantly positively associated with Interest-Enjoyment ($r = .321, p < .01; \text{small effect}: r = .001$) meaning that people may experience more enjoyment in an activity when they have goals set; Competence ($r = .346, p < .01; \text{small effect}: r < .001$) suggesting that people who set goals may do so to improve on their own skills; and Fitness motivations subscale ($r = .324, p < .01; \text{small effect}: r = .001$) meaning that people who participate in physical activity for fitness purposes may also establish goals. Thus, Clear
Unambiguous Feedback was significantly positively associated with Interest-Enjoyment \((r = .356, p < .001; \text{small effect: } r < .01)\) meaning that people who participated in physical activity for their own enjoyment may also be aware of their progress throughout the activity; Competence \((r = .423, p < .001; \text{small effect: } r < .01)\); and the Fitness motivations subscale \((r = .261, p < .01; \text{small effect: } r = .009)\) meaning that people who engaged in physical activity for fitness purposes may also have been aware of how well they were doing in the activity. Again, this dimension of flow (Unambiguous Feedback) was not associated with appearance or the social motivation subscales. The flow with Interest-Enjoyment \((r = .365, p < .001; \text{small effect: } r < .01)\) suggesting that people who participated in physical activity for their own enjoyment also experienced higher levels of concentration; and Competence \((r = .431, p < .001; \text{small effect: } r < .01)\) meaning that people who participated in physical activity for their own benefit also experienced high levels of concentration. This dimension of flow was not associated with the Appearance, Fitness or Social motivation subscales.

Interest-Enjoyment \((r = .416, p < .001; \text{small effect: } r < .01)\) meaning that people who experience total control also participated in physical activity for their own interest-Enjoyment and Competence Total \((r = .340, p < .01; \text{small effect: } r < .01)\) suggesting that people who experience total control also participated in physical activity for their own Appearance, Fitness or social motivation subscales. The flow dimensions of
associated with the Appearance or Social motivations subscales but was significantly positively associated with Interest/Enjoyment ($r = .622, p < .001$; small effect: $r < .001$) suggesting that people who participate in physical activity for their own enjoyment also experience intrinsic enjoyment; Competence ($r = .515, p < .001$; small effect: $r < .001$) suggesting that people who participate in physical activity for their own benefit also experience intrinsic enjoyment; and Fitness ($r = .310, p < .01$; small effect: $r = .002$) suggesting that people who participate in physical activity for fitness reasons also experience intrinsic enjoyment. Total Motivation was significantly positively associated with the following dimensions of flow: Challenge-Skill Balance ($r = .490, p < .001$; small effect: $r < .001$); Clear Goals ($r = .306, p < .01$; small effect: $r = .003$); Unambiguous Feedback ($r = .311, p < .01$; small effect: $r < .001$); Concentration on the Task at Hand ($r = .283, p < .01$; small effect: $r = .006$); Sense of Control ($r = .254, p < .01$; small effect: $r < .001$); their current skill level, possibly due to the decreased chance of failure. These results may also suggest that people who have high motivation towards participation in physical activity also set goals, are aware of how well they are doing during participation, have higher concentration levels; have greater sense of control in an activity and experience intrinsic enjoyment. Total Motivation was not associated with the Merging of Action and
physically activity for their own interest may do so for their own benefit or for fitness or

445. p < .001: small effect; r < .001); and social (r = .369. p < .001: small effect <
adherence (sport physical activity), motivation and now, while controlling for socio-

(sport physical activity) and predictor variables (socio-demographics, Total Motivation

with gender bUI was negatively associated with age meaning that as age increased ($f^3 = -$
variables explained 7.1% of the variance in total anxiety. Step 2 of this model revealed that greater motivation ($\beta = .323, p \leq .01$) was related to greater participation in sport physical activity, and accounted for 9.9% of the total variance. After controlling for gender, age and motivation, Total Flow was not significantly related to sport physical activity. This regression model explained 14.9% of the total variance within sports participation.
physical activity was positively associated with Total MOivation ($r = .327, p < .01$) and explained $9.9\%$ of the variance. Results from step 3 indicated that sports physical activity was not significantly associated with the Challenge-Skill Balance dimension of Flow and only contributed $0.2\%$ to the explained variance. Overall, this regression model explained $12.6\%$ of the total variance within sports participation.

Table 6: Hierarchical regression analysis of Sport PA and the Challenge-Skill Balance dimension of Flow controlling for socio-demographics and MOivation

To determine the relationship between sport physical activity participation and the Merging of Action and Awareness dimension of Flow, a hierarchical linear regression model was computed (Table 7). Results from step 1 indicated that sport physical activity was not significantly associated with gender or age. Results from step 2 indicated that
aClivity was not significantly associated with the Merging of Action and Awareness regression model explained 1.4% of the total variance within sports participation was positively associated with motivation ($\beta = .328, p \leq .01$) and explained 0.3% of the
Table 7: Hierarchical regression analysis of Sport PA and the Merging of Action and Awareness dimension of Flow controlling for socio-demographics and motivation

Table 8: Hierarchical regression analysis of Sport PA and the Clear Goals dimension of Flow controlling for socio-demographics and motivation
Unambiguous Feedback dimension of Flow, a hierarchical linear regression model was computed (Table 9). Results from step 1 indicated that sport physical activity was not significantly associated with gender or age. Results from step 2 indicated that sport physical activity was positively associated with motivation ($f^2 = .331$, $P < .001$) and explained 10.4% of the variance. Results from step 3 indicated that sport physical activity was not significantly associated with the Unambiguous Feedback dimension of Flow and only explained 2.4% of the variance. Overall, this regression model explained 13% of the variance.

Table 9: Hierarchical regression analysis of Sport PA and the Unambiguous Feedback dimension of Flow controlling for socio-demographics and motivation
Table 10: Hierarchical regression analysis of Sport PA and the Concentration on the Task at Hand dimension of Flow controlling for socio-demographics and motivation

Table 11: Hierarchical regression analysis of Sport PA and the Sense of Control dimension of Flow controlling for socio-demographics and motivation
computed (Table 12). Results from step 1 indicated that sport physical activity was not significantly associated with gender or age. Results from step 2 indicated that sport physical activity was positively associated with motivation ($\beta = .330, p < .01$) and explained 10.4% of the variance. Results from step 3 indicated that sport physical activity was not significantly associated with the Loss of Self-Consciousness dimension of flow and did not contribute anything to the explained variance. Overall, this regression model explained 10.9% of the total variance within sport participation.

Table 12: Hierarchical regression analysis of Sport PA and the Loss of Self-Consciousness dimension of Flow controlling for socio-demographics and motivation
To determine the relationship between sport physical activity participation and the
computed (Table 13). Results from step 1 indicated that sport physical activity was not
significantly associated with gender or age. Results from step 2 indicated that sport
physical activity was positively associated with motivation ($\beta = .345, p = .001$) and
explained 1.2% of the variance. Results from step 3 indicated that sport physical activity
was not significantly associated with the Transformation of Time dimension of flow and
did not contribute anything to the explained variance. Overall, this regression model
explained 11.9% of the total variance within sport participation.

Table 13: Hierarchical regression analysis of Sport PA and the Transformation of Time
dimension of Flow controlling for socio-demographics and motivation
14). Results from step 1 indicated that sport physical activity was not significantly positively associated with motivation ($r = .327$, $p < .01$) and explained 10.1% of the variance. Results from step 3 indicated that sport physical activity was not significantly

Table 14: Hierarchical regression analysis of Sport PA and the Autotelic dimension of Flow controlling for socio-demographics and motivation
Participants were divided into two groups (active and less active) based on their Total Physical Activity scores (for respondents with complete scores) being below and above the 50th percentile. Respondents in the less active/sedentary group (n = 42) on average scored 5.46 (SD = .517; SE = .080) on the Total Physical Activity index (1 = sedentary, 15 = highly active) and scores ranged from 4.13 to 6.13. Respondents in the active group (n = 42) on average scored 6.99 (SD = .541; SE = .084) on the Total Physical Activity index and scores ranged from 6.25 to 8.38.

For the 48 participating respondents, a series of independent t-tests were computed. Group differences were illustrated by these t-tests as well as descriptive statistics and t-tests. According to the Kolmogorov-Smirnov normality tests, the following outcomes were clear:

- Active participants (D(40) = .159, p < .05)
- Active participants (D(40) = .159, p < .05)
Goals for less active participants ($D(38) = .203, p < .001$) and active participants ($D(40) = 142, p < .05$); Unambiguous Feedback for active participants ($D(40) = .184, p < .01$); Transformation of Time for active participants ($D(40) = .147, p < .05$); and All total for active participants ($D(40) = .146, p < .05$).

According to Levene's Test, Loss of Self-Consciousness was the only now subscale that violated the assumption of homogeneity of variance ($F(1, 76) = 4.962, p < .05$) among active versus less active participants. The highest to lowest now subscale totals for active participants were as follows: Autotelic, Merging of Action and Awareness, Concentration on the Task at Hand, Transformation of Time and Loss of Self-Consciousness. The highest to lowest now subscale totals for less active participants were as follows: Sense of Control, Autotelic, Clear Goals, Unambiguous Feedback, Challenge/Skill Balance, Merging of Action and Awareness,
Table 15: Descriptive Statistics and T-Tests of Active versus Sedentary Exercise Participants in the Reporting of Flow

<table>
<thead>
<tr>
<th></th>
<th>K-S D&lt;sub&gt;(df)&lt;/sub&gt;</th>
<th>n</th>
<th>M (SD)</th>
<th>SE</th>
<th>K-S D&lt;sub&gt;(df)&lt;/sub&gt;</th>
<th>n</th>
<th>M (SD)</th>
<th>SE</th>
<th>t&lt;sub&gt;(df)&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>078&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>38</td>
<td>32.0 (4.72)</td>
<td>.77</td>
<td>10&lt;sup&gt;(40)&lt;/sup&gt;</td>
<td>40</td>
<td>33.6 (4.18)</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>159&lt;sup&gt;(31)&lt;/sup&gt;&lt;sup&gt;*&lt;/sup&gt;</td>
<td>41</td>
<td>3.6 (.59)</td>
<td>09</td>
<td>15&lt;sup&gt;(40)&lt;/sup&gt;&lt;sup&gt;+&lt;/sup&gt;</td>
<td>41</td>
<td>3.9 (.59)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>109&lt;sup&gt;(31)&lt;/sup&gt;</td>
<td>42</td>
<td>3.6 (.56)</td>
<td>09</td>
<td>12&lt;sup&gt;(40)&lt;/sup&gt;</td>
<td>41</td>
<td>3.5 (.63)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>203&lt;sup&gt;(38)&lt;/sup&gt;&lt;sup&gt;***&lt;/sup&gt;</td>
<td>41</td>
<td>3.9 (.75)</td>
<td>12</td>
<td>14&lt;sup&gt;(40)&lt;/sup&gt;&lt;sup&gt;+&lt;/sup&gt;</td>
<td>42</td>
<td>4.1 (.57)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>136&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>41</td>
<td>3.7 (.71)</td>
<td>11</td>
<td>18&lt;sup&gt;(40)&lt;/sup&gt;&lt;sup&gt;+++&lt;/sup&gt;</td>
<td>42</td>
<td>3.9 (.63)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118&lt;sup&gt;(36)&lt;/sup&gt;&lt;sup&gt;*&lt;/sup&gt;</td>
<td>42</td>
<td>3.3 (.85)</td>
<td>13</td>
<td>18&lt;sup&gt;(40)&lt;/sup&gt;&lt;sup&gt;+++&lt;/sup&gt;</td>
<td>41</td>
<td>3.5 (.68)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>42</td>
<td>3.9 (.71)</td>
<td>11</td>
<td>11&lt;sup&gt;(40)&lt;/sup&gt;</td>
<td>41</td>
<td>4.0 (.65)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>111&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>4</td>
<td>3.2 (1.08)</td>
<td>17</td>
<td>13&lt;sup&gt;(40)&lt;/sup&gt;</td>
<td>42</td>
<td>3.3 (.81)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>131&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>41</td>
<td>3.3 (.66)</td>
<td>010</td>
<td>42</td>
<td>41</td>
<td>3.3 (.88)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>134&lt;sup&gt;(38)&lt;/sup&gt;</td>
<td>42</td>
<td>3.9 (.80)</td>
<td>12</td>
<td>41</td>
<td>41</td>
<td>4.2 (.62)</td>
<td></td>
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</tbody>
</table>
compared to less active participants ($M = 32.0$, $SD = 4.72$) experienced a higher Total Flow suggesting that active participants may experience more flow during physical

Again, although not statistically significant, active participants compared to less active participants reported greater flow among the following dimensions: Challenge/Skill Balance, Clear Goals, Unambiguous Feedback, Concentration on the task.

This suggests that active exercise participants, compared to people who adhere to less exercise, may participate in more physical activities that match their current skill level; set clearer goals prior to physical activity participation; are more aware of their progress in physical activity; and during physical activity participation may have better concentration, experience higher levels of control, only focus on activity participation and are not preoccupied with other unrelated thoughts and experience an altered in time. Less active participants reported greater Merging of Action and Awareness and Loss ($M = 3.6$, $SD = .56$) compared to active participants ($M = 3.5$, $SD = .63$) experienced a higher

active respondents, a series of independent t-tests were computed. Group differences
investigated. The assumption of normality was determined with the Kolmogorov-Smirnov test (Field, 2005). Levene's test for testing homogeneity of variance was performed to determine if the variance between the two groups was roughly equal (Field, 2005). Table 16 illustrates the results of these assumption tests as well as the descriptive statistics and t-tests. According to the Kolmogorov-Smirnov normality test, the following motivation subscales were not normally distributed: Interest/Enjoyment for active participants (D(42) = .161, p < .01); Competence for active participants (D(42) = .166, p < .01); Appearance for less active participants (D(39) = .201, p < .001) and for active participants (D(42) = .155, p < .05); and Fitness for less active participants (D(39) = .202, p < .001) and active participants (D(42) = .184, p = .001). According to Levene's test, Interest/Enjoyment was the only motivation subscale that violated the assumption of Homogeneity of Variance \((F(1, 79) = 8.039, p < .01)\) among active versus less active participants. The highest to lowest motivation totals for active participants were as follows: Fitness, Interest/Enjoyment, Competence, Appearance and Social. The highest to lowest motivation totals for active participants were as follows: Fitness, Interest/Enjoyment, Competence, Appearance and Social. The highest to lowest motivation totals for active participants were as follows: Fitness, Interest/Enjoyment, Competence, Appearance and Social. Although the results were fairly predictable, unexpected results. For instance, the highest motivator for both active and less active participants was Fitness suggesting that although active and less active participants do not participate in the same amount of physical activity, they do participate in physical activity...
for the same reason—mainly for health purposes. The second highest motivators for active and less active participants were Interest/Enjoyment and Appearance respectively. Thus, people who are more physically active may tend to participate in more physical activities for their own pleasure whereas people who are less physically active may tend to only participate in physical activity if they feel they are physically unattractive. This finding suggests that active participants experience more intrinsic motivation with regards to physical activity in comparison to less active participants who appear to be more extrinsically motivated with regards to physical activity.

Table 16: Descriptive Statistics and T-Tests of Active versus Sedentary Participants in the Reporting of Motivation

<table>
<thead>
<tr>
<th>Flow Dimensions</th>
<th>Levene’s Test F(df(1, df))</th>
<th>K-S D(df)</th>
<th>n</th>
<th>M (SD)</th>
<th>SE</th>
<th>K-S D(df)</th>
<th>n</th>
<th>M (SD)</th>
<th>SE</th>
<th>t(df)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Motivation</td>
<td>.029 (1.79)</td>
<td>.112 (39)</td>
<td>39</td>
<td>5.2 (.83)</td>
<td>.13</td>
<td>.105 (42)</td>
<td>47</td>
<td>5.6 (.82)</td>
<td>.13</td>
<td>2.32 (78.41)</td>
</tr>
<tr>
<td>Interest/enjoyment</td>
<td>8.04 (1.79)**</td>
<td>.106 (39)</td>
<td>41</td>
<td>5.0 (1.41)</td>
<td>.22</td>
<td>.161 (42)**</td>
<td>42</td>
<td>6.0 (.83)</td>
<td>.13</td>
<td>3.89 (64.49)</td>
</tr>
<tr>
<td>Competence</td>
<td>.801 (1.79)</td>
<td>.122 (39)</td>
<td>42</td>
<td>4.9 (1.26)</td>
<td>.19</td>
<td>.166 (42)**</td>
<td>42</td>
<td>5.9 (1.17)</td>
<td>.18</td>
<td>-3.52 (81.54)</td>
</tr>
<tr>
<td>Appearance</td>
<td>1.14 (1.79)</td>
<td>.201 (39)**</td>
<td>40</td>
<td>5.7 (1.26)</td>
<td>.20</td>
<td>.155 (42)*</td>
<td>42</td>
<td>5.7 (1.30)</td>
<td>.20</td>
<td>.071 (80)</td>
</tr>
<tr>
<td>Fitness</td>
<td>.049 (1.79)</td>
<td>.202 (39)**</td>
<td>42</td>
<td>6.2 (.86)</td>
<td>.13</td>
<td>.184 (42)**</td>
<td>42</td>
<td>6.4 (.69)</td>
<td>.11</td>
<td>-0.87 (82)</td>
</tr>
<tr>
<td>Social</td>
<td>1.50 (1.79)</td>
<td>.105 (39)</td>
<td>39</td>
<td>3.9 (1.37)</td>
<td>.22</td>
<td>.064 (42)</td>
<td>42</td>
<td>4.1 (1.68)</td>
<td>.26</td>
<td>-0.66 (79)</td>
</tr>
</tbody>
</table>

* = p < .05; ** = p < .01; *** = p < .001

According to the Independent Samples Tests, active and less active participants differed significantly different in terms of Total Motivation (t(78.41) = -2.32, p < .05;
The purpose of this study was to determine whether or not people are experiencing flow during exercise participation as well as people's motives for exercising. The research questions were as follows: (1) Is there a relationship between flow experienced by exercise participants, motivation to exercise, and exercise adherence?; (2) To what extent is flow associated with exercise adherence?; and (3) What are the differences (if any) in flow experienced and motivation to exercise among active versus less active participants? The following sections will discuss the findings of this study as well as deliberate to the possible reasons for the results and their implication in sports and physical activity research and practice. The limitations of the study will then

This study uncovered some interesting results regarding gender, flow, and motivation. In terms of the relationship between gender and flow, gender was significantly positively related with the Challenge/Skill Balance dimension of flow (small effect size) suggesting that males may participate in physical activity where the challenge meets their current skill level. Also, gender was significantly positively related with Total Flow (large effect size) meaning that males experience more flow in comparison to females.
During physical activity participation. Participants in this study were non-randomly selected and the majority of males participated in higher intensity physical activities. That is, the majority of males in this study reported playing basketball and other highly sport-oriented activities, while the majority of females reported participating in aerobics, walking, cleaning, and other medium intensity activities. Therefore, in the current study, males and females participated in two different categories of physical activity. The challenge of an activity correlating with your current skill level is important in higher intensity physical activities but may not be as important in less intense physical activities. Thus, in the current study, males and females were not homogeneous in terms of the intensity of their most frequent physical activities which is a potential explanation for the

Several studies have investigated gender differences in the experience of flow among varsity athletes or in the participation of specific intense physical activities. Thus, in these studies, males and females are both participating in high-intense sport-related physical activities. For example, Hall et al. (2007) conducted a study to examine flow experiences following a variety of outdoor activities that were part of a study-abroad course. Ninety college students (55 females, 35 males; mean age = 20.30 ± 1.04 years) participated in this study while studying abroad in Australia for 3 weeks. Participants completed the Flow State Scale-2 (Jackson & Eklund, 2004) after the completion of three days of activities (rappelling (the controlled descent down a rope), canyoning, and snorkeling). These results were then compared with the means published by Jackson and Eklund (2004) for exercise and sport activity. The mean flow score was higher for the
canyoning; and \( M = 4.16 \pm 0.49 \) for snorkeling when compared with scores reported for exercise (\( M = 3.78 \pm 0.53 \)) and sport activity (\( M = 3.78 \pm 0.50 \)). Similar results were

Interestingly, there were no gender differences in terms of flow experiences. Thus, the experience of flow may be affected more by the type of physical activity one participates in rather than gender differences in these perceptions. Outdoor recreation, sports, and other highly intense physical activities may afford the experience of flow more than

Gender differences in the experience of flow during physical activity were also not evident in a study conducted by Russell (2002) which examined qualitative and quantitative aspects of flow within a group of 42 college-age athletes (15 females, 27 males, mean age = 20.43) representing team sports (i.e., football, baseball, volleyball, softball, and basketball; \( n = 28 \)) and individual sports (swimming, track, wrestling, and triathlon; \( n = 14 \)). The athletes were interviewed about what factors they felt helped, prevented, and disrupted flow occurrence. Results of the study indicated non-significant gender by sport interactions and non-significant main effects for the majority of the flow

there was a significant main effect for sport setting, indicating that team-sport athletes had a significantly higher level of Action-Awareness Merging than individual sport
activity) subscale, there was a trend toward significance on the gender and sport main effect for flow similarly, regardless of gender or sport setting. Therefore, although the current study found that males have higher flow levels than females, other studies did not find gender differences. It is unclear in this study whether gender differences in reporting of flow were due to real gender differences in optimal experiences, gender differences in the type of physical activity participation or simply a sample bias.

The current study also found gender differences related to motivation to participate in physical activity. Gender was significantly positively related to the Interest in Enjoyment and Competence (participating in physical activity to better oneself) motivation subscales suggesting that males participate in physical activity for their own interest, enjoyment, and to improve their own knowledge/skill base. According to Dunning (1986), sports serve as a secondary reinforcer of masculine identity which may explain why males may participate in physical activity to better themselves. Gender was also significantly positively associated with total motivation (medium effect size) suggesting that males experienced greater levels of motivation to be physically active. This is in contrast to other studies exploring the role of motivation in exercise adherence which did not find any gender differences (Rodgers et al., 2002; Ryan et al., 1997). However, Kilpatrick et al., (2005) conducted a study to compare motivations for sport participation versus exercise among college students and it was determined that males had higher levels of motivation for challenge, competition, social recognition, strength, and endurance in comparison to females. Similar to the experience of flow, motivation...
may also berclated to the lypeofphysical activity one participates in (Kilpatrick et al., 2005). Aspreviouslydiscussed, the males in the current study reported participating in physical activities with a higher intensity which may suggest why their motivation levels were higher. Thus, although the current study found that maleshave higher motivation levels than females, the gender diTerencescould be the result of gender diTerences in the type of physical activity participation or the non-random sampling technique employed resulting in non-equivalent groups in terms of the type of physical activity participation

This study also uncovered results regarding age and flow. Research shows the inverse relationship between age and physical activity participation is well documented (Sallis, 2000). The current study supports this relation as age was significantly negatively associated with Total Physical Activity (medium effect size) meaning that as age increased, physical activity decreased. Age was also significantly positively related with Challenge/Skill/Balance (large effect size) signifying that as age increased, so did the ability to find activities that met the skill level of the individual participant. As one gets older, self-awareness may increase and thus the ability to match skill level with the challenge of an activity. Thus, the ability to find activities that match one's skill level may increase with age. Seongyeul (1988) conducted a study to investigate the relationship between life satisfaction and the now experience among older adults. The respondents
potential changes may impact physical activity adherence across the lifespan
work), (2) Sport Physical Activity (Sport PA; participation in sportlphysical activity) and (3) Non-sports leisure (Leisure PA; physical activity during transportation and in daily life). Leisure PA was significantly positively associated with Merging of Action and significantly associated with motivation in terms of the relationship between physical activity and the motivation sub-scales. With regards to physical activity being associated found in this study. Interestingly, Sport PA was found to be not significant with Total Flow. Also, Total PA didn’t appear to have any relationship to flow. Reasons for this not always be interest or enjoyment in those types of activities. However, Total PA was significantly positively associated with clear goals in physical activity (small effect size) physical activity participation in leisure. This suggests that clear goals in physical activity may be more evident in higher intensity levels of sportlphysical activity conceivably due to the competitive nature of sports. Additionally, it's possible that an activity must possess a certain element of challenge in order to permit individuals to experience the state of flow; activities during Work PA or Leisure PA do not possess such a challenge (e.g., walking). Also, since this study was conducted among the general population of physically active people, it is possible that the flow experience is only present among
actively trying to exert control). Loss of Self-Consciousness (only concerns participating in the activity and nothing else) and Transformation of Time (altering of experience these characteristics. As participants in this study participated in physical flow. These results suggest that you need not necessarily need a high level of motivation
motivation to participate in sports physical activity as opposed to leisure or work physical activity. This result is not unexpected considering that Leisure PA measured people's physical activity in transportation and in their daily lives while Work PA was concerned with physical activity received during a work day. People are more likely to report high levels of intrinsic motivation as a result of sport and physical activity participation when they likely experience rushes of endorphins. Additionally, endorphin rushes are attributed to the Oowstate (Marr. 2001) and people who are intrinsically motivated as opposed to extrinsically motivated tend to experience these more frequently. For example, Tsorbatzoudis et al. (2006) conducted a study aimed at investigating the effects of motivational dimensions proposed by Pelleliet al. in 1995. Both on sport participation levels and on intention for continuing participation among adult recreational sport participants. Similar to the current study, Tsorbatzoudis et al. provided evidence to suggest that increased motivation leads to increased participation. Hamer, Karageorghis, and Vlachopoulos (2002) have reported that introjected regulation (to attain or avoid an outcome (Biddle, 2009) and identified regulation (doing something that was personally important (Losier et al., 1999) were the only predictors of exercise dependence among endurance athletes, whereas intrinsic motivation (the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn (Deci & Ryan, 2000) was shown to have no relationship with exercise dependence. Sport participation on a regular basis has been shown to have positive effects on physical health (Dishman, 1988; Martin & Dubbert, 1982; Paffenbarger & Hyde, 1988; TafTenger et al., 1986; Sisovickelel, 1985; Stehen et al., 1985): psychological
physical activity. it is no surprise that Clear Goals significantly predicted the Dispositional Flow Scale-2 which will further be discussed in the limitations section of the study. However, it is my opinion that the sample utilized in this study was the primary
the 50th percentile. This study conducted a series of independent tests to determine
as stated previously. Therefore, although there is a slight difference in the amount of physical activity among the two groups, both groups feel internally driven and experience enjoyment during participation in the activity as well as the activity.

The Experience of **Flow and Motivation Among Active versus Less Active**

This study conducted a series of independent tests to determine differences in motivation experienced among active versus less active respondents. Results found no significant differences among the reporting of motivation (total of the five subscales) to physical activity participation. Although there have been many studies conducted on the subject of exercise relapse, success in ameliorating long-term maintenance of physical activity has been minimal (Dishman, 1982, 1988a, 1988b; Martin & Dubbert, 1982, 1984). This is likely due to the fact that most exercise programs are designed for a substantial portion of the North American population can be classified as inactive or sedentary and who possibly haven't intent incommencing exercise (Prochaska et al., 1994). Consequently, effective interventions must be directed to the needs of the sedentary population (Prochaska & Marcus, 1994). Therefore, this may explain the insignificant motivation results for less active participants. The current study found that Total Motivation and the five motivation subscales were all significant in terms of the
participate in exercise may not be representative of actual motivation to exercise but

significant reasons for participation in sport. Similarly, it was determined in this study

sport participation has been determined to have substantial effects on exercise adherence
(Wanck, 1993). Therefore, it is not surprising that the Interest & Enjoyments subscale was
highly significant for active participants. Reasons for this result could be due to the fact

that if you participate in an insufficient amount of physical activity to be considered an

imperative due to the fact that if you plan to participate in a high amount of physical

Although this study had many positive aspects to it, it also had many limitations.
Oow, motivation and physical activity levels could not be determined. It was difficult to
representative of the population of exercise and non-exercise participants in St. John's

Using the Dispositional FlowScale-2 (Jackson et al. 2002), a scale which

now experiences in chosen physical activities and in general also caused problems for
this study. As it is challenging to quantitatively measure now, the questionnaire may
have been difficult to comprehend as questions dealt with highly psychological aspects
Additionally, it is difficult to call past now experiences as it is primarily an "in-the
moment" experience. It is believed that using the Experience Sampling Method to
measure the now experience would have been more appropriate as this scale aims to
measure physical activity in daily activities. Additionally, this study may have benefited

points that should be taken into consideration for future research. This study addressed
three questions: (1) Is there a relationship between now experienced by exercise
participants, motivation to exercise, and exercise adherence?; (2) To what extent is now
Although this study examined relationships between self-efficacy and physical activity, it may be of interest to future researchers to examine what type of motivation (intrinsic/extrinsic) influences exercise adherence the most. Also, considering that the majority of the people in this study were from St. John's, NL (Newfoundland has one province), therefore, it is suggested that full re-studies conducted in this study in different provinces throughout Canada. Finally, it is recommended that studies be conducted with larger, random, and more heterogeneous samples in order to further explore the
How does one achieve this unique condition of now? Unfortunately, the answer is as complex as the theory itself. Due to now's highly individualized nature, only general guidelines are capable of being provided and it is how the individual interprets and uses the guidelines that will determine the likely occurrence of flow. The following section aims to provide an understanding of these guidelines and their practical implications.

In order to experience now, we must first be able to control (to some degree) our experience of differentiating among a variety of stimuli, choose certain stimuli and focus selectively. (Csikszentmihalyi, 1988, p.17). Additionally, consciousness is largely present when something happens. The questioning of one's adequacy is absent; however, when one does stop to think about oneself, positive feedback is overwhelming. Consequently, we need to be able to control what we consciously perceive by only paying attention to relevant stimuli which are congruent with our goals. For example, an individual playing tennis should try to control their thoughts and not think about anything negative such as losing the match. It is the ability to choose and select information that is positive and congruent with our goals.
goals that we are able to take control of our consciousness and are more likely to experience flow, thus improving the overall quality of our lives (Csikszentmihalyi, 1990).

Making External Conditions Match our Goal

A second strategy in attempting to achieve flow is attempting to make external conditions match our goals. For instance, if we believe that intelligence is an important component to our happiness, we may support local education institutions or read more educational texts in order to gain intelligence. If we are unable to intrinsically create conditions to match our goals, we must attempt to modify external conditions. Our goals are then directly projected into our external conditions (Csikszentmihalyi, 1990, p. 43). For example, if the individual playing tennis wants to hit 5 balls over the net, they will position themselves properly and swing their racquet effectively in order to do so. However, if we cannot change our external conditions, we must modify ourselves.

Changing our Experience of External Conditions and Better Goals

Keeping in line with the previous example, if we are able to modify what we mean by intelligence, then we learn to understand that achieving intelligence is not always possible and that not achieving ultimate intelligence will not likely make us unhappy (Csikszentmihalyi, 1990). Therefore, it is the ability to change how we will
experiences something to make it line with all goals that we develop a sense of happiness. The following section will discuss some specific activity guidelines in terms of motivation, maintaining appropriate focus, optimal arousal and relaxation priorities to the Todo anything well a certain level of motivation must exist. Individuals can be motivated for a number of reasons, whether they are for personal reasons or are largely flow as the more we are motivated to do something, the more likely we will be successful (Weinberg & Gould, 2003). During the activity, developing a narrow focus and staying in the present are critical components to achieving flow (Weinberg & Gould, 2003). We must be able to dismiss anything external and just focus on the present components of the activity as complete concentration will aid us in achieving flow. Therefore, this requires much mental activity. While some activities require you to be relaxed, others may require you to be the opposite. Our psychological preparation will play a great part in our ability to achieve success in an activity. Activities such as pre-match and pep talks are important for an athlete prior to a match. Whatever the activity, appropriate measures such as the amollnt and type of skill required should be taken into consideration (Weinberg & Gould, 2003). Finally, confidence and a positive mental attitude are salient factors, regardless of the person's abilities. Believing that you can succeed all the challenges at hand can create a sense of control amongst the individual, which in turn may lead to optimal experiences (Weinberg & Gould, 2003, p. 146). Therefore.
have a strong relationship with physical activity adherence and therefore did not have

be a highly psychological state that is perhaps a state almost exclusive to highly

this study were representative of the general population of exercise people. It is quite
likely that participants were not in a position to experience now. As this study was


