NORMS IN SPORT AND EXERCISE

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ABSTRACT

Studies examining descriptive norms in the activity area have demonstrated that an individual's perceptions of others' behaviour were related to (Priebe & Spink, 2011; Spink, Crozier, & Robinson, 2013), and influenced (Priebe & Spink, 2012, 2014) individual behaviour. Guided by focus theory of normative conduct (Cialdini, Reno, & Kallgren, 1990), the purposes of the studies examined in this thesis were three-fold: (1) to assess whether norms are related to an intention that is not a direct reflection of the norm, (2) to add to the examination of the relationship between norms and self-reported activity to include both descriptive (i.e., perceptions about others' behaviour) and injunctive (i.e., perceptions about others' approval) norms, and (3) to use a construct from another theory (i.e., positive outcome expectations from social cognitive theory, Bandura, 1986) to strengthen the predictions from focus theory of normative conduct to individual's physical activity. In Study 1, which was concurrent in design, the relationship between descriptive norms reflecting prosocial behaviour and an individual's intention to return to the group in youth sport camp participants was examined. A positive relationship emerged wherein individuals were more likely to intend to return to their group in the future when they also perceived that more group members provided encouragement, congratulations, positive and constructive feedback (i.e., prosocial) to other group members. Study 2 was an experimental field study, where the influence of normative (descriptive, injunctive) and non-normative (personal, team) motivational messages on self-reported frequency of maximal effort in adult volleyball athletes was examined. Individuals exposed to the normative messages about others exerting effort reported significantly higher frequencies of maximal effort compared to those exposed to messages highlighting personal reasons for exerting effort (i.e., to improve athletic ability). However, no differences emerged between

normative messages about the effort levels of others and those who received messages about working hard for the team. In Study 3, an online experimental study, exposure to messages differing in levels of descriptive norms and positive outcome expectations was examined in relation to the exercise patterns of university students during a final exam period. All students reported decreases in their activity from their typical levels during the exam period. However, between-group differences emerged between the two groups exposed to the message that many others were active during exams (high descriptive norm). When that message was coupled with a high positive outcome expectation, individuals reported significantly greater levels of moderate and vigorous physical activity than when the normative message was accompanied with a low positive outcome expectation. Results from these three studies suggested the following: (1) a descriptive norm surrounding one class of behaviours related to an individual's perceptions regarding an intention to return in the future to that setting, (2) normative messages influenced an individual's perceptions of how often he/she exerted maximum effort more than non-normative personal messages in sport, and (3) a message highlighting that many others were active during an exam period (high descriptive norm) influenced self-reported individual physical activity differently depending on the level (high, low) of positive outcome expectation provided.

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

GENERAL INTRODUCTION

When one thinks about people, one thinks about groups, and the physical activity setting is no exception. Many of the physical activities that individuals participate in involve other people: whether it is a sports team, aerobics class, or running group. This should come as no surprise as people are social creatures by nature (Baumeister & Leary, 1995). Further, as social beings, people rely on others for information about how to navigate the environment. Given this reliance, where there are others, there will be social influence.

The influence of others is all around us. It would be difficult, if not impossible, to go through a day without delivering or receiving some type of social influence. Whether it is doing something because of a desire to conform to the expectations of others (normative influence), or doing it because of the value that conformity may have for the individual (i.e., an individual's belief that the group knows more - informational influence), individuals are constantly being influenced by others (Deutsch & Gerard, 1955). Is wearing *lululemon* clothes or selecting the restaurant with the most customers as a dining destination a decision devoid of outside influences? Research would suggest otherwise.

It is well documented that the behaviour of others has a strong influence on individual behaviour (Asch, 1952; Latané & Darley, 1968; Milgram, 1974; Sherif, 1937). Two famous experiments serve to illustrate. In one of the classic experiments illustrating the power of normative influence, Solomon Asch (1952) asked an individual to select a stimulus line that was the same length as a comparison line, after witnessing confederates unanimously select an incorrect stimulus line. Results revealed that many of the individuals selected the same incorrect line as the confederates, even though the correct line should have been obvious. This incorrect response suggested that the reference line selected by the confederates in the group was used as information to

make the judgment requested rather than objective information from the individual's own sensory system. In another classic experiment, Muzafer Sherif (1937) demonstrated the power of informational influence using the autokinetic effect. In that experiment, individuals estimated how far a point of light moved in a darkened room when alone, or with others also estimating. After hearing the estimates of others, the initial diverse estimates of individuals eventually converged to the same distance.

Both of these studies suggest that social influence information affects how individuals respond. Within the general social influence literature, there is a growing body of evidence suggesting that *social norms* (rules that are understood and acted upon by group members without the force of laws, Cialdini & Trost, 1998) do impact the behaviour of individuals in meaningful and predictable ways (Goldstein & Cialdini, 2007; Turner, 1991). A number of theories have been developed that outline possible avenues through which social norms can affect behaviour. While theories exist where normative constructs comprise one element (e.g., subjective norm in theory of planned behavior, Ajzen, 1985), the theories that will be outlined in the following section have as their sole focus normative behaviour and have been used extensively.

1.1 Theoretical Frameworks

1.1.1 Social Norms Theory

Social norms theory is concerned with situations wherein individuals' perceptions of what others are doing are different from what they are actually doing (Perkins & Berkowitz, 1986). These misperceptions, termed pluralistic ignorance, are thought to cause individuals to change their own behaviour to conform to the misperception (Prentice & Miller, 1993). Misperceptions surrounding others' behaviour can occur for both healthy behaviours (which are typically underestimated by individuals) and unhealthy behaviours (which are typically overestimated). When behaviours are underestimated, individuals will be less likely to engage in them. Conversely, when they

overestimate how often behaviours occur, they are likely to increase their own engagement in these behaviours. Behaviour change occurs by correcting an individual's misperception of the existing behavioural norm within the group.

For the most part, the predictions of social norms theory have been well documented in the context of alcohol consumption. A number of studies reveal that college students typically overestimate the frequency and quantity of their peers' alcohol consumption (Borsari & Carey, 2003; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999). In turn, this overestimation is associated with increased drinking behaviour. Similar misperceptions also have been extended to a number of other negative health behaviours, including those that are overestimated such as cigarette smoking (Grube, Morgan, & McGree, 1986) and eating disorders (Kusch, 2002). For positive health behaviours, research has found misperceptions surrounding the underestimation of condom use (Scholly, Katz, Gascoigne, & Holk, 2005). Further, a number of colleges and high schools have successfully reduced problem behaviour by developing campaigns promoting accurate and healthy norms (see Berkowitz, 2004 for review).

Although support has been generated for some health behaviours where behavioural misperceptions are common, social norms theory has received little attention in the physical activity context. This might not be surprising given that behaviour change is associated with correcting misperceptions. As the perceptions in activity settings typically match the existing situation (e.g., media reports suggesting that a majority of adults are inactive appear to be consistent with published data, Cameron, Wolfe, & Craig, 2007), social norms theory would be of little use in an activity setting.

1.1.2 Deviance Regulation Theory

According to the tenets of deviance regulation theory (Blanton & Christie, 2003), an individual's decision to engage in behaviour will be made on the basis of whether the individual

perceives that the behaviour is the norm or not. In particular, the tenets of the theory predict that individuals tend to pay more attention to the costs and benefits of associating the self with behaviours that *deviate from the norm*. Further, individuals tend to pay less attention to the consequences associated with conforming to the norm. The theory identifies that rare attributes, attitudes, and behaviours of those who deviate from the norm will be more diagnostic of, and central to, one's social image than those that are common. Accordingly, individuals try to preserve a positive social image by seeking deviation from social norms in positive ways and by avoiding deviation from social norms in negative ways (Blanton & Christie, 2003). As the norm portrayed by the media suggests that most Canadians are not physically active enough (Cameron et al., 2007), deviation regulation theory would suggest that highlighting the positive attributes of individuals who deviate from this norm would be beneficial in influencing individuals to become more active. Deviation regulation theory has been used successfully in areas predicting behaviours such as condom use (Blanton, VandenEijnden, et al., 2001; Blanton, Stuart, & VandenEijnden, 2001) and the intention to get a flu vaccine (Blanton, Stuart, & VandenEijnden, 2001).

While the premise is interesting, deviation regulation theory has received no research attention within the physical activity literature. Blanton and Christie (2003) argued that the predictions of deviation regulation theory typically hold in decisional contexts where individual decisions primarily reflect identity concerns. In thinking about being active, there are likely many other important aspects associated with the decision to be active (e.g., barriers to exercise, time-constraints, health) than preserving one's social image.

1.1.3 Social Identity/Self-Categorization Theories

Both social identity and self-categorization theories suggest that group membership can significantly impact individual behaviour. Given that most social systems contain collections of individuals who differ from each other in a number of different ways (Tajfel, 1979), individuals

identifying with a group (or many groups) are influenced by these perceived differences between groups. As such, individuals are likely to conform to normative behaviour that further makes the ingroup distinct from other groups.

In early work, Tajfel and Turner (1979) demonstrated that putting anonymous, unrelated individuals into temporary groups influenced the member's perceptions and actions in systematic ways (e.g., members favoured the ingroup over the outgroup). To explain this effect, Tajfel and Turner (1979) developed social identity theory, which postulates that identification and categorization come together to transform an individual's membership in a group into an identity that affects the member's thoughts, emotions, and behaviours. Within the framework of social identity theory, individuals are motivated to conform to norms that make the ingroup identity better than, and different from, an outgroup (Rubin & Hewstone, 1998).

Social identity theory was a precursor to self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). The essence of self-categorization theory is that it offers a cognitive explanation as to why individuals' self-concepts might align with their conceptions of the groups to which they belong (Turner, 1991). Similar to social identity theory where identifying with the group is vital, self-categorization theory also suggests that an individual's perception of actual membership within the group is important. These self-perceptions are a function of the social environment, and a social identity will be adopted that maximizes contextual similarities within a group as well as differences between groups. This social categorization of the self and others into an ingroup and outgroup accentuates an individual's perceived similarity to others within the ingroup. As such, individuals are no longer represented as unique individuals, but rather as part of the ingroup, leading to collective group behaviour (Hogg & Terry, 2000).

Social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987) provide complementary explanations for why group norms are likely to serve as behavioural

standards. In general, these theories suggest that norms should guide behaviour to the extent that people have adopted the relevant group identity. In order to guide behaviour change, tenets of the two theories suggest highlighting the norm behaviour of a psychologically meaningful group (i.e., member identifies strongly with *and* perceives membership in that group). For example, student norms concerning exercise and sun-protective behaviours have been found to influence college students' subsequent behaviour, but only for those who strongly identified with their university reference group (Terry & Hogg, 1996; Terry & Hogg, 2001). In addition, research in the activity area has found that it is the behaviour of friends (assumed to be a meaningful reference group) that is related to individual behaviour the most when compared to less meaningful groups (e.g., other university students, Priebe & Spink, 2011; other athletes, Spink, Crozier, & Robinson, 2013).

1.1.4 Focus Theory of Normative Conduct

Focus theory of normative conduct (focus theory; Cialdini, Reno, & Kallgren, 1990) is based on the premise that the perception of other's behaviour will influence individual behaviour. One of the main postulates is that it distinguishes between two types of social norms. The first is called a descriptive norm. These norms reflect an individual's perception of what is most commonly done (i.e., "what is"), thereby providing individuals with evidence as to what will likely be effective action in a situation. The second type is the injunctive norm, which refers to the individual's perceived degree of social approval/disapproval for behaviour. This type of norm specifies "what ought to be done".

Each norm operates from a different motivational base. It is thought that the descriptive norm motivates behaviour by serving as a cue as to what is appropriate behaviour in a situation, while the injunctive norm motivates individuals via social sanctions – to avoid negative or seek positive consequences. Given these different motivational platforms, Cialdini (2003) also noted that descriptive and injunctive norms influence behaviour via different information processing routes.

The descriptive norm is thought to offer an information processing advantage or efficiency, where a decisional shortcut can be used when one is trying to choose how to behave in a situation (Cialdini et al., 1990). By noting how most others are behaving and then imitating their actions, it is thought that one would usually choose efficiently. In contrast, acting on information provided by injunctive norms requires more cognitive demand because it is based on an understanding of the culture's moral rules (i.e., what others are likely to approve). Instead of simply imitating the behaviour of others (as with descriptive norms), the individual has to process how others perceive this behaviour, and whether there are consequences associated with conforming (or not) with the norm. Overall, focus theory postulates that if individuals perceive that a majority of others will engage in a behaviour (i.e., the descriptive norm) or believe that a majority of others will approve of them engaging in a behaviour (i.e., the injunctive norm), they are more likely to perform that behaviour. While these two norms might act simultaneously in some situations (e.g., what is approved of, is often what is typically done), Cialdini and colleagues (1990) highlight that they are distinct.

The second main postulate of focus theory proposes that a given norm, whether descriptive or injunctive, will influence behaviour to the extent that it is focal (i.e., salient) in the individual's consciousness. When persons are dispositionally or temporarily focused on normative considerations, they are most likely to act in norm-consistent ways (e.g., Berkowitz, 1972; Berkowitz & Daniels, 1964). For example, when an anti-littering injunctive norm (i.e., others do not approve of littering) was made salient, littering rates were less than in conditions where a pro-littering descriptive norm (i.e., many people litter) was made salient (Reno, Cialdini, & Kallgren, 1993). In situations where both descriptive and injunctive norms are present (and possibly conflicting), the norm that is more salient will influence behaviour to a greater extent. Researchers have attempted to tap into norm salience by utilizing confederates (Cialdini, Kallgren, & Reno, 1991), altering the

environment (Cialdini et al., 1990), and providing positive versus negative messages (Cialdini et al., 2006). In these studies, behaviour was influenced to a greater extent by the norm that was ostensibly made salient.

Research supporting focus theory has shown that norms influence a multitude of individual behaviours, such as littering (Cialdini et al., 1990), recycling (Schultz, 1999), energy conservation (Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008), environmental conservation (Cialdini et al., 2006), and alcohol consumption (Larimer et al., 2011; Polonec, Major, & Atwood, 2006). Further, support for the relationship between norms and behaviour is abundant across many different health behaviours, including alcohol intake (Larimer et al., 2011), healthy eating (Stok, de Ridder, de Vet, & de Wit, 2012) and, most importantly for this thesis, physical activity (Priebe & Spink, 2011, 2012, 2014).

1.2 Theoretical Framework for the Dissertation

For the current dissertation, focus theory provides a useful framework to study norms and address the research questions of interest. Focus theory (Cialdini et al., 1990) was chosen as the guiding framework for this set of studies for three reasons. First, as one of the main foci in this thesis was the distinction between descriptive and injunctive norms, focus theory considers the unique influences of both types of norms. A second reason to utilize focus theory is that it highlights the importance of norm salience, which was considered in the third study. Last, a number of studies to date have found support for focus theory within physical activity settings (Priebe, 2013; Priebe & Spink, 2011, 2012, 2014; Spink et al., 2013). However, a number of questions remain to be answered from the results of these studies.

It also is worth reiterating that the other normative theories outlined above do not always map well with physical activity or with the research questions asked in this dissertation. First, as the perception surrounding others' participation in activity is likely congruent with the societal norm,

there is no misperception to correct. Therefore, trying to change these normative perceptions by social norms theory in the physical activity realm makes little sense. Further, none of the research questions addressed in this dissertation involved correcting misperceptions.

Suggestions from deviation regulation theory, on the other hand, posit that the motivational basis for conforming or deviating from a norm will be based on personal attributes associated with an individual's self-identity. While identity certainly has been implicated in activity (e.g., Strachan, Flora, Brawley, & Spink, 2011), it is unclear whether participation in physical activity is always grounded in identity concerns. As the prime driver in deciding to be active is unknown, it is unclear whether the utility of deviation regulation theory would be applicable to physical activity settings. Social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987) both focus specifically on how an individual's perception of group identity impacts the norm-behaviour relationship. As group identity was not a major concern in the present dissertation, the tenets of these theories were not examined.

1.2.1 Complementary Theory

In addition to Cialdini and colleagues' (1990) focus theory, social cognitive theory was used in a complementary fashion to inform the hypothesis of the third study. The concept that a valued positive outcome expectation around engagement in behaviour will influence an individual's engagement in that behaviour (Bandura, 1977, 1986) complements the rationale that descriptive norms must be salient in order to have an effect, as posited in focus theory. For example, if a behavioural outcome is valued by an individual, then that individual may pay more attention to information surrounding the prevalence of that behaviour. The purpose of the third study in this dissertation was to examine the possible interactive effects of positive outcome expectations and descriptive norms on behaviour through the complementary use of focus theory (Cialdini et al., 1990) and social cognitive theory (Bandura, 1977, 1986).

1.3 Focus Theory of Normative Conduct and Physical Activity Research

In terms of physical activity research, the majority of research has focused on descriptive norms (Okun, Karoly, & Lutz, 2002; Okun et al., 2003; Priebe & Spink, 2011, 2012, 2014). In general, a positive relationship has been established between the perception of others' activity behaviour (the descriptive norm) and individual physical activity (Okun et al., 2002, 2003). Further, this relationship was evident even after controlling for participants' personal reasons for being active (e.g., health reasons), suggesting that the perception of others' activity behaviour is an important factor when looking at individual behaviour (Priebe & Spink, 2011). The descriptive norm-behaviour relationship also has been extended to the sport setting, where it was found that the perception of how hard others worked was related to an individual's self-reported effort (Spink et al., 2013).

Researchers also have successfully implemented norm interventions to influence subsequent physical activity behaviour (Priebe, 2013; Priebe & Spink, 2012, 2014). For example, providing participants with normative messages targeting descriptive norms increased mild physical activity levels (i.e., stair use) compared to non-normative messages (Priebe & Spink, 2012). Further, descriptive norm messages influenced behaviour on a physical activity task (i.e., plank hold) compared to a no message condition (Priebe & Spink, 2014).

1.4 Gaps in the Literature

Although there have been a number of consistent findings in the activity literature, there are a number of gaps that will be addressed in this dissertation. A majority of the activity research has examined the norm-behaviour relationship by examining norms that directly match with self-reported behaviour (e.g., norm for physical activity and self-reported physical activity, Priebe & Spink, 2011, 2012; the norm for exerting effort and self-reported effort in sport teams, Spink et al., 2013). However, what has received little attention in the activity setting is the relationship between

other group norms that do not directly match, but might be related to the outcome of interest. For example, would an individual's perception that teammates support players when they make a mistake relate to that individual working harder?

In the activity setting, another outcome that has received attention is an individual's intention to return to the group in the future. An activity setting where intention to return to the group has been examined is sport (Spink, 1995). In terms of a behaviour that might be related to an individual's reported intention to return to a sport group is the prevalence of prosocial behaviour within the group. As prosocial behaviours are those intended to help or benefit others (Eisenberg & Fabes, 1998), an individual may be likely to want to return to a group where group members engage in these behaviours. Within sport groups, examples of prosocial behaviour include encouraging a group member, providing positive feedback, giving constructive feedback, and congratulating a team member for a good play (Kavussanu & Boardley, 2009).

Although the relationship between prosocial behaviour and intention to return has not been examined to date, there is evidence to suggest a positive relationship between the two constructs. In the sport setting, it has been suggested that positive interpersonal relationships that involve encouragement and support among members may facilitate the maintenance of the group (Munroe, Estabrooks, Dennis, & Carron, 1999), as well as keep young females involved in sport (Coakley & White, 1992). These findings suggest that the engagement of others in prosocial behaviour is related to adherence-related constructs. While the relationship between prosocial behaviour and intention to return to a sport group has not been examined previously, when individuals perceive that many group members engage in prosocial behaviours (e.g., encouragement, positive feedback), an individual might be more likely to want to return to that group.

In addition, none of the extant norm research in the physical activity area has examined the impact of others on individuals' perceptions that occur because of group involvement. Social impact

theory (Latané, 1981) suggests that the influence of others on an individual increases with the strength, immediacy, and number of sources present. Thus, examining the effect of social influence generated within intact groups, where individuals are directly surrounded by others (e.g., sport groups), appears warranted.

A third gap in the activity literature relates to the lack of research examining injunctive norms. As highlighted previously, a majority of the research in physical activity has examined descriptive norms (e.g., Priebe & Spink, 2011, 2012, 2014). However, focus theory (Cialdini et al., 1990) also identifies injunctive norms as an important normative influence of individual behaviour. In one activity study that examined injunctive norms, results indicated that injunctive norms did not influence subsequent behaviour significantly when compared to a control condition (Priebe, 2013). However, it is possible that the result was context specific, as theory would suggest that injunctive norms work particularly well when social sanctions are important for engaging in a behaviour that is normative. Supporting this supposition, Priebe (2013) highlighted that individuals may not have perceived social sanctions (i.e., approval/disapproval) as being important in relation to the specific activity task (i.e., plank hold) examined. However, changing to an activity context where sanctions may be more important might provide a better test of the theory. One setting within the activity area where approval may be important, and where successful performance is partially dependent on an individual's contributions to the group, is sport. Research has highlighted that social sanctions are important within a sport team (Munroe, Estabrooks, Dennis, & Carron, 1999). Thus, injunctive norms may have a greater influence in sport behaviour.

Last, one of the tenets of focus theory (Cialdini et al., 1990) posits that the norm (descriptive or injunctive) will only influence behaviour to the extent that the norm is made focal (i.e., salient). In a study assessing norm salience and littering rates (Cialdini et al., 1990), it was found that when only a single piece of litter was visible (i.e., a hollowed out watermelon rind) within an environment,

littering rates were the lowest. In comparison, littering was greater when either no litter was in the environment or when a large amount of litter was present (including the watermelon rind). It was assumed that the single piece of litter (i.e., watermelon rind) brought attention to the fact that the environment was otherwise clean, and that littering was not the norm (i.e., making the non-littering norm more salient).

To date, only one study within the activity setting has tried to manipulate norm salience (Priebe, 2013). In that study, the similarity of the reference group to an individual participant was manipulated in order to make the normative message more salient. Results indicated that highlighting more versus less similar reference groups in relation to the norm did not differentially influence sedentary behaviour or light activity in office workers. However, as that study was the first to attempt to manipulate norm salience in the activity area, further investigation would provide insight into other potential methods of influencing salience.

One possible way to influence norm salience in relation to physical activity might be to highlight the benefits associated with activity. These benefits are the expectations that an individual might perceive as being associated with physical activity. Outcome expectations reflect an individual's beliefs that his or her actions will lead to a particular valued outcome (Bandura, 1977, 1986). Therefore, whether or not an individual engages in a specific behaviour is a function of the expected positive and negative consequences an individual associates with that behaviour. In addition, behaviour is influenced by the importance (i.e., value) that an individual places on the outcome expectation. By providing individuals with information about the beneficial effects of physical activity for the self that are valued (i.e., positive outcome expectations), it may lead them to pay more attention to the normative information provided. In support of this idea, research has found that the relationship between descriptive norms and alcohol use became stronger as individuals' positive outcome expectations increased (Dieterich, Stanley, Swaim, & Beauvais, 2013). When

individuals perceived that similar others consumed alcohol frequently, they were more likely to drink alcohol when they perceived more positive benefits to the self (i.e., "drinking alcohol makes me feel good") compared to individuals who perceived less personal benefits. These findings provide preliminary support for an interaction between descriptive norms and positive outcome expectations. However, no research to date has used outcome expectations as a method to enhance the salience of a normative message.

1.5 Purpose

The goal of the current research was to further examine the relationship between norms and activity in three separate studies. The relationships examined in this dissertation were guided by the tenets of focus theory (Cialdini et al., 1990). Study 1 was conducted to assess the relationship between descriptive norms surrounding positive in-group behaviours (prosocial behaviour) in a sport group and an individual's intention to return to that group in the future. The purpose of Study 2 was to assess whether a descriptive or injunctive norm intervention (versus non-normative conditions) would influence an individual's self-reported frequency of effort in a sport setting. The focus of Study 3 was the examination of the interaction between descriptive norms and positive outcome expectations on individual exercise behaviour.

CHAPTER 2

STUDY 1: EXAMINING THE RELATIONSHIP BETWEEN NORMS FOR PROSOCIAL BEHAVIOUR AND INTENTION TO RETURN

2.1 Introduction

Within a group, people come and people go. Between these entry and exit points reside those who remain, and as a result, accrue the benefits of maintaining membership in that group. What motivates individuals to want to maintain membership with a group has long held a fascination with both researchers and practitioners. One group setting where activity is being done with others is sport. As the members of a group are known to influence those around them in non-physical activity settings (Cialdini & Trost, 1998; Turner, 1991), examining the sport group context for clues as to why individuals would intend to remain in that setting would appear worthwhile.

The idea of examining group factors to explain why people would intend to return to any group setting is not new (Zander, 1976). According to Moreland and Levine (1982), an individual's likelihood of remaining with a particular group (versus departing from it) may be associated with the characteristics of the group. These characteristics can include a person's recent experiences in the group, as well as their relationships with other group members. Regarding the latter, sport research has shown that positive interactions individuals have with their group members, whether it is friendship quality (Ullrich-French & Smith, 2009) or the unity individuals feel toward the group (Spink, 1995), are related to continued group membership. The identification of these factors begs the question of whether there are other variables within a group that might influence an individual's intention to return to a sport group.

2.1.1 Social Norms

One such factor occurring within a group may be the presence of social norms, which are thought to be inevitable components that emerge when individuals come together to form a group

(Shaw, 1981). Norms reflect the rules surrounding behaviour that are understood and acted upon by group members without the force of laws (Cialdini & Trost, 1998). As norms emerge in a group to satisfy basic human needs and desires (Sherif, 1937), examining normative behaviours that are affiliated with group survival would seem pertinent.

As there are many opportunities for communicating and interacting with others in intact sport groups, it is probable that norms will develop and influence individual member behaviour. Further, the member perceptions of normative influences occurring within a sport group might contribute to an individual's intention as to whether to return to that group in the future or not.

2.1.2 Prosocial Behaviour

The behavioural norm that was of interest in this study surrounded the prevalence of *prosocial behaviours*. By definition, prosocial behaviours are those acts that benefit some other person but typically have no obvious benefit for the individual engaging in the behaviour (Baron & Byrne, 1981). This definition highlights a key feature of prosocial behaviour where the behaviour is meant to directly benefit others and not the self. Closely aligned with this definition is the construct of social support, which is defined as an exchange of resources between two individuals, perceived by the provider or the recipient to be intended to enhance the well- being of the recipient (Shumaker & Brownell, 1984). While the two constructs share obvious similarities, it has been suggested that prosocial behaviours may represent a subset of social support (Shumaker & Brownell, 1984). Regardless, the focus in this study was on prosocial behaviours as a number of examples of prosocial behaviour have been identified as emerging within a youth sport setting including encouragement, providing positive and constructive feedback, or congratulating others for a good play (Kavussanu & Boardley, 2009).

These prosocial behaviours also may be considered moral behaviours, and are influenced by societal norms and conventions that dictate the appropriateness of them (Bandura, 1986). For

example, youth sport participants learn to behave prosocially through both observational learning and the reinforcement of others within the larger socialization process. For the most part, studies have focused on examining the moral atmosphere that develops within a peer sport group, and how it relates to an individual's engagement in moral behaviours (see Weiss, Smith, & Stuntz, 2008 for a review). However, what is unknown is whether the moral atmosphere (i.e., whether others are perceived as engaging in prosocial behaviours) may relate to an individual's intention to return to that group.

In addition, a majority of the research to date examining the individual's engagement in prosocial behaviours has focused on examining the antecedents of prosocial behaviour (Kavussanu, 2008). Only one study (Sage & Kavussanu, 2008) has considered the possible consequences of being exposed to prosocial behaviours. In that study, it was found that an individual's perception of his/her own prosocial behaviours at the beginning of the season was positively related to perceptions of a task-involving climate at the end of the season. As this was the first study to examine outcomes associated with prosocial behaviours, the current study sought to add to this literature by examining whether perceptions of others' engagement in prosocial behaviours (i.e., social norms) would relate to an individual's intention to return to a group.

Although the relationship between prosocial behaviour and an individual's intention to return to the group has not been directly examined in sport, support for the relationship between the two constructs can be found. In the sport setting, it has been suggested that interpersonal relationships among members that are courteous and respectful may help groups to function well and maintain an existence (Munroe, Estabrooks, Dennis, & Carron, 1999). Further, it has been reported that one of the crucial antecedents to whether young females stay involved in sport is having peers who are supportive and encouraging (Coakley & White, 1992). Thus, it would appear as if behaviours

capturing positive interactions (i.e., prosocial behaviour) among group members would likely positively relate to one's intention to return to that group in the future.

Providing support in the form of prosocial behaviours (i.e., encouragement) to group members also has been cited as a social norm that is prominent within youth and adult sport groups (Munroe et al., 1999; Prapavessis & Carron, 1997; Shields, Bredemeier, LaVoi, & Power, 2005). However, the relationship between the descriptive norm for prosocial behaviour and intention to return to a sport group has not been directly examined. It may be that an individual would be more likely to want to return to that group at some future time, when prosocial behaviours (e.g., encouragement, positive feedback) are perceived as being normative within the peer group (i.e., majority of group members engage in these behaviours).

2.1.3 Gaps in the Literature

As noted in focus theory (Cialdini et al., 1990), an individual's perception of what many others are doing is a descriptive norm. Descriptive norms are thought to motivate behaviour through providing information to individuals about what is appropriate behaviour in a certain situation. In terms of descriptive norm/outcome interface, perceiving how others are behaving is thought to be related to an individual's own engagement in that behaviour. As such, the activity research to date has focused on the perceptions of norms surrounding one behaviour and how it relates to an individual engaging in that same behaviour. For example, communicating norms about others' physical activity was related to one's physical activity (Priebe & Spink, 2012). Similarly, witnessing the effort levels of others within a sport setting was related to self-rated individual effort in that setting (Spink, Crozier, & Robinson, 2013).

While these physical activity studies have provided insight into the relationship between norms and whether an individual's behaviour parallels the normative behaviour, little research has examined whether norm perceptions surrounding group behaviour might relate to a different

outcome. In one study, it was found that teams possessing strong norms surrounding social interactions (e.g., expectations surrounding attending social functions, interacting with other teammates), along with high levels of social cohesion, were comprised of athletes who self-reported the greatest effort in practice and competition (Patterson, Carron, & Loughead, 2005). In other words, when teams were socially cohesive, a positive relationship was found between the expectation for individuals to interact with each other and working hard. This finding highlights that knowing what is expected for one set of behaviours may possibly relate to a different member outcome. However, that study examined perceptions of others' *expectations* for behaviour (Patterson et al., 2005), whereas perceptions of *how many others* engaged in a behaviour (i.e., the descriptive norm), and how that may relate to a different outcome, has not been examined.

2.1.2 Purpose and Hypothesis

The purpose of this study was to add to the findings of previous research investigating the relationship between norms and individual behaviour. This study focused on examining normative behaviours (i.e., prosocial behaviour) that might be expected to be related to wanting to return to a group in the future. It was hypothesized that a positive relationship between norms for prosocial behaviour and intention to return to the group would emerge. This hypothesis was based on: (1) previous work demonstrating a positive relationship between supportive group behaviours and individual adherence-related outcomes (Fraser & Spink, 2002), and (2) research examining norms for social interactions and their relationship to a different outcome (i.e., self-reported effort) in sport (Patterson et al., 2005).

2.2 Methods

2.2.1 Participants

Female youth volleyball sport camp participants (N = 145) were recruited from a mid-sized Canadian university program. The mean age of the sample was 13.9 years (SD = 1.3, range = 12-

17). Female youth were examined as previous research has suggested that encouragement and support from peers is important to females in youth sport (Coakley & White, 1992).

2.2.2 Procedures

Ethical approval was obtained for this study from the University Ethics Review Board. Consent from the director of the sport camps was first obtained prior to contacting the camp coordinators. The coordinators were then contacted via e-mail about attending a portion of the camp to recruit participants and administer the paper survey. Once permission was granted, parents were informed of the study objectives on the first day of the camp and were asked to contact the researchers if they did not wish their child to participate. As participants were at an appropriate age to provide their own consent, signed parental consent was not required, but passive consent was assumed if no contact between the parents and the researcher was made. Since no parents contacted the researcher, all sport camp participants were deemed eligible to participate. On the fourth day of a 5-day camp, the researcher attended the sport camp and explained the purpose of the study to the participants. Participants were instructed that the study was voluntary, and those who volunteered provided informed consent.

The mandate of the volleyball sports camp was to develop the skills of youth, aged 13-17 years. The camp ran for four 8-hour days, followed by a half-day. Participants were involved in skill development sessions, fitness sessions, as well as played on teams that competed with each other during the camp. Within the sport camp structure, participants were divided into smaller groups based on age and skill level *(k* = 13, average group size = 11) for the duration of the camp. As such, survey completion was conducted in these small groups, so that participants could reflect on the behaviours of others within that group and their perceptions of intending to return to that specific group. The survey took approximately 5 minutes to complete and included measures of descriptive norms for prosocial behaviours and intention to return to the group in the future.

2.2.3 Measures

Descriptive norm perceptions for prosocial behaviour. The descriptive norm items assessed participants' perceptions about the prevalence of the prosocial behaviours of others in their small group. As the conceptual definition of norms involves individual perceptions (Cialdini et al., 1990), this was deemed an appropriate way to operationalize this construct. Further, previous research in activity settings has used a similar method to capture norms (e.g., Priebe & Spink, 2011; Spink et al., 2013). As the participants from the larger camp were divided into small groups, norm perceptions were asked in reference to each individual's specific group. Participants were asked to rate their perceptions of how many others within their small group used prosocial behaviours during the week long camp. Four items were modified from the *prosocial behaviour toward teammates'* subscale of the Prosocial and Antisocial Behavior in Sport Scale (Kavussanu & Boardley, 2009). The wording in the original version asked participants to report the frequency of prosocial behaviours that they engaged in themselves. Evidence supporting the construct validity and reliability of the original measure and its subscales has been reported with samples representing a broad age range including youth (Boardley & Kavussanu, 2009; Kavussanu & Boardley, 2009). However, as the purpose of this study was to examine individuals' descriptive norm perceptions, the scale was modified to ask about *how many others* in their particular small group were perceived to be engaging in prosocial behaviours. As one example, participants were asked, "How many members within this group congratulated a fellow member for a good play?" versus the original which asked, "How frequently do you congratulate a fellow member for a good play?" For all descriptive norm questions, participants answered on a five-point scale (1 = *none*, 2 = *some*, 3 = *half*, 4 = *most*, and 5 = *all*). The four items were averaged, with higher numbers indicating that more group members engaged in these behaviours (i.e., more normative). It has been suggested that minor changes to scales involving context are acceptable, and have little or no effect on the internal consistency of a

modified scale (Schutz, 1966). The internal consistency score for this study was acceptable (α = .83).

Intention to return to the group. To assess an individual's intent to participate in the same group in the future, participants were asked to respond to two questions relating to their small group: "If this camp started again next week, how likely would you be to want to return to this small group again?" and "If you had the choice to be in any small group at next year's camp, how likely are you to want to return to this small group again?" These questions were designed specifically for this study in order to reflect the intention to be a member of the same group in the future. Responses were made on a 5-point scale that included the following categories: (1) *not at all likely (at or near 0% chance),* (2) *not likely (25% chance or less),* (3) *so-so (50% chance),* (4) *likely (75% chance or better),* and (5) *very likely (at or near 100%).* The two items were averaged, with higher numbers indicating a greater intent to return. Internal consistency for this measure was acceptable (α = .72.).

2.2.4 Data Analysis

Analysis of independence. Participants in this study were part of 13 different intact groups within the larger camp, creating a hierarchical data structure with individuals nested in groups. Given that players had been part of the same small group environment for four consecutive days, one might expect some similarity among their responses based on their small group membership. This similarity among group members could result in nonindependence of responses. Independence of responses is an assumption that underlies many statistical techniques, and if ignored, may result in standard errors being underestimated, increasing the probability of a Type I error (Clarke, 2008; Raudenbush & Bryk, 2002). To evaluate the degree of response independence, an intraclass correlation coefficient (ICC) is often used. The ICC estimate corresponds to the amount of variance in individual level responses (i.e., individual's ratings) that can be explained by group level membership (i.e., what group they are in; Bliese, Halverson, & Schriesheim, 2002). The ICC can

range from 0 to 1, with higher values representing a greater degree of dependence among individuals within each group. Given the nested nature of the data (participants nested within small groups), an ICC was calculated for a null model for intention to return (no predictors) using hierarchical linear modeling (HLM).

Assessing the relationship between norms for prosocial behaviour and intention to return. HLM was selected to test the hypothesis as camp participants (Level 1) were seen to be nested within their smaller groups (Level 2) suggesting both within- and between-group components. As HLM partitions variance into within- and between-group components, the unit of analysis is at both the individual and group level. A multilevel model predicting intention to return was specified using HLM 7.0 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). The descriptive norm for prosocial behaviour was added at Level 1, centered on the grand mean. To examine whether the relationship between the norm for prosocial behaviour and intention to return varied between groups, slopes of the relationships were examined. If slopes were not significantly different, a fixed intercept would be specified (i.e., all slopes will be fixed). Otherwise, the random slope model would be interpreted. Full maximum likelihood was used for model specification.

2.3 Results

2.3.1 Analysis of Independence

To initially determine whether there was any group-level variance in intention to return, a null model was run with intention to return and no predictors. The resulting intraclass correlation (ICC) for intention to return was .079, suggesting some degree of dependence between responses from members within each group. According to Barcikowski (1981), analyzing at the individual level in this situation might be misleading owing to alpha inflation. He demonstrated that an ICC of .05 inflates a .05 alpha to .11 with group sizes around 10 members. To avoid the possibility of

committing a Type 1 error, it was deemed appropriate to use multilevel analysis to assess the relationship between descriptive norms for prosocial behaviour and intention to return to the group.

2.3.2 Assessing the Relationship between Descriptive Norms for Prosocial Behaviour and Intention to Return

Descriptive statistics for the variables indicated that the norm for prosocial behaviour (M = 3.23, SD = 0.80, range = 1.75-5) was above the scale mid-point, suggesting that just over half of individuals within a group were perceived as providing prosocial behaviour. Similarly, intention to return to the group (M = 3.89, SD = 0.89, range = 1-5) was rated above the scale mid-point, indicating that individuals were likely to want to return to the same group in the future. This finding might be expected as participants were not provided with an opportunity to compare between different group experiences, and thus could only reflect on this most recent group experience.

Table 2.1 provides the results for the null and the full models examined. In comparison with the null model (no predictors), the inclusion of the norm for prosocial behaviour improved the model fit, as indicated by a comparison of the deviance statistics ($\chi^2 = 6.38$, $p < .05$). Results from the full model revealed that the norm for prosocial behaviour was significantly related to intention to return to the group ($p = .01$). As more individuals in the group were perceived to be engaging in behaviours that help others (i.e., encouraging, providing constructive feedback), a positive relationship emerged with an individual member's intention to return to that same group in the future.

Table 2.1 Summary of Model Coefficients (SE) for Intention to Return

Parameter	Model 1 (Null)	Model 2 (Full)
Intercept	3.86 (.10)***	3.87 (.09)***
Prosocial behaviour		.23 (.09)*

Note. *$p < .05$, *** $p < .001$

As the variable slope was not significant, the recommendation of Kreft, de Leeuw, and Aiken (1995) was followed to fix the slope and center the predictor variable around its grand mean. When the slopes for the teams were fixed to be the same, it was then possible to estimate the proportion of variance that was explained at each level (Raudenbush & Bryk, 2002). Prosocial norm perceptions accounted for an estimated 3.3% of the individual-level variance in intention to return. In addition to the relationship found at the individual level, it was found that prosocial norm perceptions also accounted for an estimated 25.3% of the group-level variance in intention to return. Taking into account both individual- and group-level variance, prosocial norm perceptions accounted for a small amount of the total variance, 5%, in intention to return.

2.4 Discussion

The importance of the group's influence on individual behaviour has long been recognized (e.g., Asch, 1952; Cartwright, 1951). Although there are many factors within the group environment that may relate to an individual's intention to return to the group in the future, this study examined the perception of others' prosocial behaviours as a form of group norm. The results supported the hypothesis that the perception of the engagement of others in prosocial behaviour would be associated with an individual's intention to return. In particular, the perception of *how many others* (i.e., the descriptive norm) were providing encouragement, congratulations, positive and constructive feedback to others within the group was positively related to an individual's report of intending to return to the same group in the future.

2.4.1 Group Factors and Intent to Return

This result supports the suggestion that interactions among group members may relate to an individual's intention to return to a group (Moreland & Levine, 1982) at a general level. At a more specific level, the results add to previous sport research examining perceptions of cohesion and intention to return (Spink, 1995). Findings indicated that the perception of others' prosocial

behaviour directed toward group members was related to intention to return to the group. This finding is aligned with research in sport settings, which found that the presence of positive interactions among their peers were associated with adherence-related outcomes (Coakley & White, 1992; Fraser & Spink, 2002; Munroe et al., 1999). What is interesting about the results of this study was that as the proportion of group members that were perceived as positively interacting with others increased, individuals were more likely to want to return to the group.

2.4.2 Descriptive Norms and Intent to Return

The finding that descriptive norms were positively related to a self-reported outcome in sport is consistent with previous research, which examined self-reported effort (Spink et al., 2013). What is novel about this study was the examination of norms that were not directly related to the outcome of interest. Descriptive norms are thought to motivate by informing individuals about what is the most appropriate behaviour in a given situation (Cialdini et al., 1990). As such, researchers in the activity literature have generally examined the norm for a specific behaviour and how that norm relates to an individual's engagement in that same behaviour (Priebe & Spink, 2011, 2012, 2014; Spink et al., 2013). However, the results of this study suggest that knowing what is most commonly exhibited for one set of behaviours may relate to a different outcome; in this case, an individual's intention to return. This finding is in line with prior research, which indicated that norms surrounding social interactions were related to self-reported effort of athletes (Patterson et al., 2005). In the present study, perceiving that a greater number of group members were displaying prosocial behaviour was related to the perceived likelihood of returning to the same group in the future.

2.4.3 Individual- versus Group-Level Variance

The sources of variance that emerged in this study also are worth mentioning. The results from the multilevel model revealed that perceptions of the group's prosocial behaviour predicted intention to return at both the individual and group levels. Of interest, more of the variance was

accounted for at the group (25.3%) than the individual level (3.3%). This finding may seem contrary to what may be expected as intention to return was assessed as an individual's perception of his/her intent to return, so intention would ostensibly be identified as an individual-level variable. So, how might one explain the majority of the variance coming from the group level?

Participants in this study spent a significant amount of time interacting over the course of the five-day camp. As a result, the individuals within each group were likely influenced by their group members (as acknowledged by the interdependence of responses, ICC = .079). Consequently, individuals had somewhat similar perceptions and responses as their other small group members. As they had shared experiences within the camp setting, these shared experiences appeared to relate to individual responses to returning to the group. Further, the questions surrounding intent focused on returning *to the same group*, possibly increasing the likelihood that individuals would have similar answers as their group members. Taken together, to find group-level variance emerging in the perceptions of prosocial behaviour predicting intention to return may have been a function of the group environment or the focus on 'group' in the wording of the items.

Although multilevel modelling was used to control for the interdependence of the data, the fact that majority of the variance emerged at the group-level for what would appear to be an individual-level variable highlights the importance of the need to examine interdependence as an important social psychological variable versus a mere statistical nuisance variable (Kashy & Kenny, 2000). In this study, although individual perceptions were assessed, individuals were members of intact groups where the influence of others might be expected (Latané, 1981), so ignoring the group-level effects might miss some key information. Thus, whether the dependent variable reflected an individual or group orientation, it might be prudent when assessing a variable that flows from a group setting to use a multilevel model that accounts for the dependence among responses within groups (Spink, Nickel, Wilson, & Odnokon, 2005).

It also is important to note that the total amount of variance accounted for in intention to return by the norm for prosocial behaviour was low (5%) compared to other norm research in sport (Spink et al., 2013). In that study, the descriptive norm surrounding others' effort accounted for 13% variance in an individual's self-reported effort (Spink et al., 2013). One possible explanation concerns the different nature of the research questions. In this study, interest was in how an individual's perceptions of the proportion of individuals engaging in one behaviour might relate to the likelihood of a different behavioural goal (i.e., intent). In comparison, the Spink et al. (2013) study examined the perceptions of others' effort in relation to individuals' perceptions of their own effort. Given the correspondence between the independent and dependent measures differed in the two studies, the relationship might be expected to be weaker in this study compared to when measure correspondence between norms and the outcome was much stronger (Spink et al., 2013).

2.4.3 Limitations and Future Directions

While novel in its approach to examining norms and an individual's intention to return to a group in the activity setting, there also are limitations inherent in this field study. The first relates to the unique nature of the sample examined. The sample consisted of females, ranging in age from 12-17 years, participating in a one-week volleyball sport camp. Thus, the results are limited to this population. Future research should examine the results of this study with a more diverse sample including males and other sport groups.

It also is worth noting that the correlational nature of the design precludes assigning any cause-effect relationship. To address cause-effect relationships requires the design and use of experimental studies. Further, Shadish, Cook, and Campbell (2002) suggested that in order to build a case for causality, one should first establish that variables of interest are related, which might be done most efficiently using a monomethod study using self-reports. As this study was exploratory, the results provide initial evidence of a relationship between the norm for prosocial behaviour and

intention to return. In order to establish causality, experimental research manipulating the prosocial behaviour exhibited by group members should be conducted.

Another factor that may have influenced the results was the use of similar scale formats (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). In particular, both the norms for prosocial behaviour and intent to return were measured on a five-point Likert scale. As the participants for this study were youth, similar scale formats were used in order to make it easier for participants to respond by requiring less cognitive processing. However, the consistency of the scale format may have increased the amount of covariation observed between the constructs, therefore biasing the results. To address this possibility, different scale anchors were utilized for each construct in order to reduce this bias.

Results also should be interpreted in relation to the questions that participants were asked. In particular, participants were asked to indicate *how many* of their group members exhibited the multiple prosocial behaviours. The average response by participants to these questions was just over the mid-point ($M = 3.24$), suggesting that just over half of group members were perceived by individuals as engaging in these prosocial behaviours. Previous research has used different ways of conveying the descriptive norm. In particular, descriptive norms have been conveyed using different ratios (e.g., 77-99%, Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2005; "7 out of 10," Rimal, 2008) or different descriptors (e.g., "most students," Polonec et al., 2006; "a typical student," Rimal, 2008). Therefore, it is plausible that the approximately 50% found in this study for the behavioural average may not be a large enough majority to indicate that prosocial behaviours were the "norm." One possible reason for this finding may be attributed to the short-duration of the group. It may be that participants were not together long enough to exhibit prosocial behaviours to any great extent. Further, the design of the question responses precludes knowing whether the participants actually perceived the 'frequency' of others engaging in the behaviours as normative within the group, and

whether this frequency would be associated with intentions to return. This awaits future research. It can only be suggested that as the number of individuals within a group that were perceived as providing prosocial behaviours increased, the more likely an individual was to report a greater intention to return to that group.

Finally, this study focused on examining prosocial behaviours toward group members. Future research also may examine the opposite of prosocial behaviour, *antisocial behaviour*, in relation to intention to return. Examples of antisocial behaviour in sport are swearing, verbally abusing or criticizing others, or showing frustration toward a teammate who is playing poorly (Kavussanu & Boardley, 2009). Individuals may not wish to remain a member of a group if the perceived norm is that group members are engaging in these undesirable acts. However, it also is possible that this antisocial behaviour may make little difference as evidenced in Lenk's (1969) classic study on rowing teams. It was found in that study that antisocial behaviours among teammates were not negatively associated with staying with the team. This awaits future research.

2.5 Bridge to Study 2

Although the results of Study 1 demonstrated that the perception of others' behaviour was related to an individual's intention to return to a sport setting, only one source of social norm was examined. As highlighted in focus theory (Cialdini et al., 1990), not only does an individual's perception of how others behave (i.e., the descriptive norm) influence an individual, but so does one's perception of the approval of others (i.e., the injunctive norm). As noted in the general introduction, injunctive norms have received little consideration in activity settings generally (Priebe, 2013). In addition, there has been no prior examination of injunctive norms in the sport setting specifically. Therefore, the purpose of Study 2 was to add to the literature by examining both descriptive and injunctive norms in the sport setting.

CHAPTER 3

STUDY 2: EFFECTS OF NORMATIVE AND NON-NORMATIVE MESSAGES ON PERCEIVED EFFORT IN SPORT

3.1 Introduction

Few would dispute the need to work hard as a key component to attaining one's goals in an achievement setting. One setting where effort has been typically viewed as being integral to both the performance of the individual and the team's outcome is sport (i.e., win/lose; Giacobbi, Roper, Whitney, & Butryn, 2002; Howe, 2012). Given that effort is a discretionary resource, and team sport participation is done with others, it is plausible that how hard one works as a member of a sport team might be influenced by an individual's perception of how hard others are working within that same team environment. Support for this speculation has been found in one sport study where athletes reported that they were motivated by others when they perceived their teammates as working hard (Vazou, Ntoumanis, & Duda, 2005).

3.1.1 Social Norms

While there are many ways that others within a group can influence individual behaviour, one factor that has been identified is the presence of social norms (Goldstein & Cialdini, 2007; Turner, 1991). As highlighted in focus theory (Cialdini et al., 1990), norms come in two different forms - descriptive and injunctive. An individual's perception of what others are doing is known as the descriptive norm. The descriptive norm is thought to motivate individuals to act in specific ways by serving as a cue identifying what is the most appropriate behaviour in a specific situation. For instance, consider the new athlete on the team who is wondering how to support the good play of teammates. If that athlete observes others on the team consistently providing high-fives after witnessing a good play, these cues would suggest that providing high-fives is the appropriate thing to

do. Therefore, she/he is likely to engage in this same type of supportive behaviour following a good play by a teammate.

The injunctive norm reflects an individual's perception related to others' approval/disapproval of a specific behaviour. Simply, it focuses on "what ought to be." It moves beyond merely perceiving appropriate behaviour as captured by descriptive norms to prescribing appropriate behaviour and proscribing inappropriate behaviour (Cialdini & Trost, 1998). As one example, an ice hockey player new to a team might witness teammates banging their sticks on the boards each time a teammate instigates a fight with an opponent. This individual is then more likely to initiate a fight in the future as the player recognizes that such behaviour will likely receive the "seal of approval" by teammates.

3.1.2 Descriptive Norms and Activity

Although both descriptive and injunctive norms are expected to influence individual behaviour, the majority of research in the physical activity area has focused on descriptive norms. This may not be surprising, as there has been longstanding documentation with many behaviours that perceiving what others are doing has a strong impact on individual behaviour (e.g., Asch, 1956; Milgram, Bickman, & Berkowitz, 1969; Sherif, 1937). In terms of physical activity, a positive relationship has emerged between descriptive norm perceptions and behaviour (Okun, Karoly, & Lutz, 2002; Okun et al., 2003; Priebe & Spink, 2011) revealing that the more an individual perceived that others were engaging in physical activity, the more likely they were to engage in being active. Similarly, there is support for this relationship in sport, where player perception of how hard team members were working was positively related to an individual's perceived effort (Spink, Crozier, & Robinson, 2013).

Researchers also have successfully implemented norm interventions to influence subsequent health behaviours (Priebe & Spink, 2012, 2014; Robinson, Fleming, & Higgs, 2014). For example,

compared to a health-promoting message, messages used to promote healthy eating were more effective at increasing students' healthy food choices when the message targeted descriptive norms (Robinson et al., 2014). Specifically, for students who reported eating fewer fruits and vegetables, those who were provided with the message that the *typical* student ate five servings of fruits and vegetables a day increased their fruit and vegetable intake more than those who received a message highlighting the health benefits of eating five servings.

A similar finding has been reported in the activity setting where it has been found that providing office workers with normative messages targeting descriptive norms increased mild physical activity in the work setting (i.e., stair use) compared to non-normative messages (Priebe & Spink, 2012). While personal reasons for being active (i.e., health, appearance) were used to represent the non-normative messages in that study, it is possible that other forms of non-normative messages might result in a different outcome. In the sport setting, for instance, team goals are often highlighted, and thus it is plausible that players might be motivated to exert effort in order to help the team achieve its goal. Given that athletes are likely exposed to team goals that often supersede personal goals (e.g., there is no "I" in team), it would appear fruitful to examine whether non-normative messages that include team reasons would influence effort in a sport setting to the same extent as normative messages.

3.1.3 Injunctive Norms and Activity

Although there is evidence of the descriptive norm-behaviour relationship in physical activity settings (Priebe & Spink, 2011, 2012, 2014; Spink et al., 2013), there has been a noticeable lack of research examining the injunctive norm. Only one study to date has attempted to examine injunctive norms with a physical activity task (Priebe, 2013). In that study, participants who received an injunctive norm message did not significantly differ on the activity task from those who received no message. This finding was surprising, as previous research in other areas (e.g., environmental

conservation) has found injunctive norms to influence whether individuals littered or not (Cialdini et al., 1990; Reno, Cialdini, & Kallgren, 1993).

One possible reason for the discrepancy in the results between the activity and the non-activity behaviours examined to date relates to how injunctive norms are proposed to influence behaviour. In order for injunctive norms to influence individuals to act, focus theory (Cialdini et al., 1990) would suggest that individuals must perceive social sanctions (i.e., approval/disapproval) associated with engaging in the behaviour. While the social sanctions associated with a behaviour such as littering are constantly portrayed in the media (i.e., littering is disapproved; Bickman, 1972; Toronto's Litter Prevention Program, 2002), this does not appear to be the case with physical activity tasks (Priebe, 2013). That is, there are typically few social sanctions associated with performing no activity versus the dose-response target of 150 minutes. As sanctions may not be salient, it follows that the message contained in injunctive norms may not impact individual behaviour on specific physical activity tasks.

Sport is one activity setting that might be an exception, as social sanctions for engaging in a task-related behaviour seem to be important (Munroe, Estabrooks, Dennis, & Carron, 1999). In a qualitative study examining norms in sport, athletes were asked to identify normative behaviours where violators would be criticized (a type of social sanction) by other group members (Munroe et al., 1999). Results revealed that the lack of giving 100% effort was found to be the most cited norm associated with criticism in both practice and competition. In a related finding from a different study, athletes indicated that they were pleased when others put forth effort, yet dissatisfied when teammates were not working hard (Vazou et al., 2005). Given this apparent collective expectation for team members to work hard, it follows that individual players will likely experience pressure to conform and behave appropriately (Patterson, Carron, & Loughead, 2005). The present study sought

to examine the injunctive norm-behaviour (effort) relationship in a sport setting where social sanctions may be more salient.

3.1.4 Purpose and Hypothesis

The purpose of the current study was to examine the impact of normative and non-normative messages on perceived effort in sport. Specifically, the separate effects of messages containing normative information (descriptive norms, injunctive norms) and non-normative information (personal reasons, team reasons) on self-reported frequency of effort were of interest. It was hypothesized that those who received descriptive and injunctive norm messages would report more frequent maximal effort compared to those who received the personal reason messages (non-normative). This hypothesis was informed by focus theory, which suggests that both descriptive and injunctive norms would influence behaviour (Cialdini et al., 1990). Further, research has found that messages highlighting normative reasons influenced behaviour more than messages highlighting personal reasons (Priebe & Spink, 2012; Robinson et al., 2014). In terms of the team-reason condition, no hypothesis was advanced as team reasons have yet to be examined as a non-normative message.

3.2 Methods

3.2.1 Participants and Design

Participants were recruited from an adult recreational volleyball league (SAVA) in a mid-sized Canadian city. A 4 x 2 mixed-factorial design was used. The between-groups factor had four levels (i.e., descriptive norm, injunctive norm, personal reason, and team reason), with individuals within each group receiving different messages relating to effort in volleyball. The within-individual factor had two levels where self-reported frequency of effort was assessed twice for each individual (pre- and post-intervention).

A total of 126 individuals agreed to participate and completed the pre-intervention survey. In terms of demographics, a majority of these participants were female (N = 101; 78.3%). The average age of participants was 33.9 years (SD = 8.9), individuals had been playing in the city league for approximately 8.1 years (SD = 6.81), and on their current team for an average of 5.2 years (SD = 4.7). Participants were members of 29 different teams. An average of 4.2 players participated per team (range = 1-9). In addition, participants played in different divisions, ranging in competitive level (A being the most competitive, D being the least) and different formats (co-ed, n = 55 and women only, n = 71). In order to reduce the likelihood of message contamination between members of the same team, this study utilized a quasi-experimental design. Specifically, teams, not individuals, were randomly assigned to one of four conditions using a random number generator. The number of participants per condition was relatively equal - descriptive norm, n = 32; injunctive norm, n = 32; personal reason, n = 31; team reason, n = 31.

3.2.2 Procedures

The University Ethics Review Board approved this study. The volleyball league provided permission for the researcher to recruit through its organization. Recruitment began at the captains' meeting prior to the start of the season, where the researcher provided details of the study, and captains of interested teams provided their contact information. Initial data collection from all participants took place on one game day at the beginning of November 2013, after the league had been running for seven weeks. This timing allowed participants enough time to have experience with the team and their own effort. The league ran from mid-September until the beginning of February, with a total of 17 game days. On the first data collection day, the teams who provided their contact information were approached by a research assistant before one of their regular-season games. Interested participants provided informed consent and filled out a survey about their team, which took approximately five minutes to complete. This survey assessed their own perceived effort

while playing on this team as well as demographic information (i.e., age, sex, team name, team and league tenure, and email addresses).

Teams were then randomly assigned to one of four conditions: descriptive norm, injunctive norm, personal reason, or team reason. Over the next four weeks, participants received four six-line messages appropriate to their assigned condition via the email addresses they provided. To be consistent with suggestions that messages should vary slightly (Harkins & Petty, 1981), email messages were varied by including a different type of situation where individuals might exert effort. These situations included winning by a large margin, losing by a large margin, when the opponent had scored five points in a row, and doing anything (e.g., chasing, diving for the ball) in order to keep the ball in play.

The messages used were developed specifically for the current study; however, they were guided by work done previously by Priebe and Spink (2012) in the activity setting, which followed three principles of effective messaging. First, all of the messages targeted public behaviours (i.e., exerting effort at a sport league is public and noticeable to others; Lapinski & Rimal, 2005). Second, messages were designed to be believable (i.e., participants were told the message content was based on the results from the first survey; Polonec et al., 2006). Last, messages were repetitious (i.e., four messages were similar in nature, but with a variation in the type of effort behaviour suggested in each; Harkins & Petty, 1981). Of note, to reduce the influence of order effects, the four messages were randomly presented to participants in each condition. The first two messages were sent three days apart in the week leading up to the next game, while the third and fourth messages were sent three days apart during the week leading up to the last data collection time point. The entire study was completed over four weeks (see Figure 3.1 for an overview).

While all participants received the same four examples of situations in which to work hard during volleyball games, the reasons for working hard were manipulated and specific to their condition (see Appendix H for all messages). Specifically, emails highlighted the following aspects:

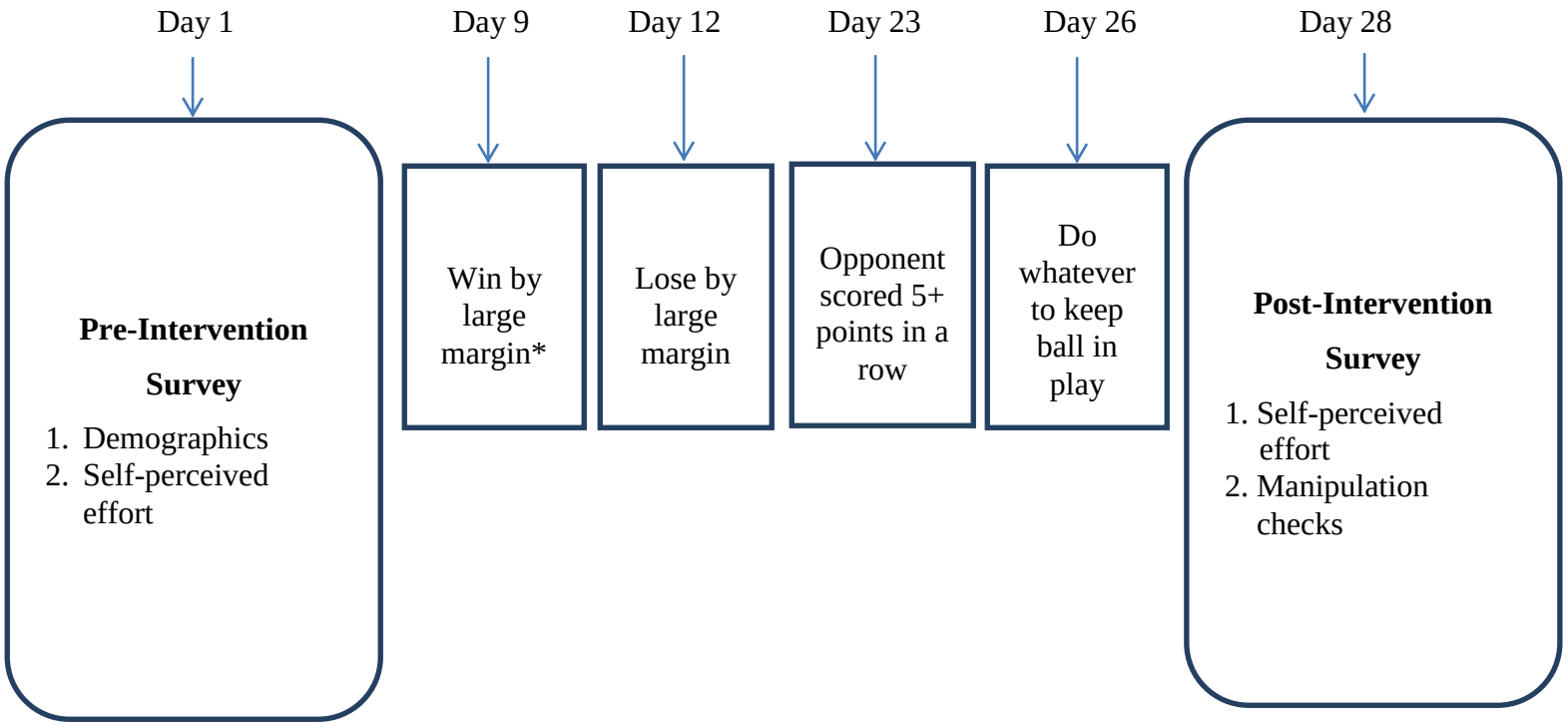
1. the descriptive-norm condition promoted working hard because others in their division worked hard,
2. the injunctive-norm condition endorsed working hard because others in their division approved of them working hard,
3. the personal-reason condition encouraged working hard in order to improve their skill, and
4. the team-reason condition promoted working hard to help their team win.

In order to make the fictitious normative messages believable, messages were crafted to indicate that a certain percentage of others in the players' division had indicated that they either engaged in (descriptive norm) or approved of (injunctive norm) working hard (i.e., exerting 100% effort in different situations). As an example, the email suggesting working hard for those in the descriptive-norm condition read:

> "Join Other Players in Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How are players like you working hard? In a recent survey, players in your division provided the reasons they worked hard - **95%** of the players on those teams reported giving 100% effort **even when losing games by a large margin**! - Give 100% effort even when losing by a lot - the common strategy of players on teams in your SAVA division."

Two days after receiving the final email message, participants were approached by a research assistant before a regular-season game to fill out a second survey, which assessed self-reported effort, receipt of messages, and a manipulation check. All items took approximately five minutes to complete.

Figure 3.1 Overview of Study 2 Procedures



**Note.* Messages were randomly presented across the four messages in each condition.

3.2.3 Measures

Self-reported effort. Effort was measured using questions developed specifically for the current study. To increase message/outcome correspondence, the outcomes assessed paralleled the effort behaviours targeted within the email messages that participants received. An example item was, "When playing volleyball in this league, I give 100% effort when the opposing team has scored 5 or more consecutive points in a row." This item was used because previous research with volleyball teams has revealed that a scoring run of five uninterrupted points was perceived to have an effect on perceptions of psychological momentum (Eisler & Spink, 1998). The implication being that team members would need to work hard to win the next point in an attempt to disrupt the opposing team's momentum. Other items in the measure reflected how frequently individuals exerted effort when winning by a large margin, when losing by a large margin, and doing whatever it took to keep the ball in play. Informal discussions with volleyball players in this league suggested that all these situations were ones that tend to separate those who are working hard versus not. Responses were made on a 9-point Likert scale, ranging from 1 = *almost never*, to 9 = *almost all the time*. At both data collection time points, self-reported frequency of effort was averaged across the four outcomes, and alpha values were computed (Time 1, $\alpha = .74$; Time 2, $\alpha = .91$). While the alpha value for Time 2 was much higher, both values were at a level that is typically viewed as acceptable (Nunnally & Bernstein, 1994).

Manipulation checks. Participants were asked to complete manipulation checks to assess whether the messages were both equivalent and believable to the participants. First, participants were asked whether they could recall receiving and reading messages that contained reasons for working hard in the volleyball league (yes/no). Those who reported "no" were removed from the

study.[1] A total of 3 individuals reported they did not recall receiving the messages, and observation revealed that they were distributed across three of the groups (one participant each from the descriptive-norm, personal-reason, and team-reason conditions, respectively). Participants were asked to identify how many messages they remembered receiving (open-ended). Last, participants were asked two questions in relation to message quality: how *believable* and *persuasive* the messages were. These two questions were assessed on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Of interest, those who reported "no" to receiving and reading the messages also did not answer any of the above manipulation check questions.

3.2.4 Data Analysis

To examine the effects of normative and non-normative messages on self-reported effort, an ANCOVA was used for those who recalled receiving e-mail messages. Although randomization was used, a lower retention rate at the second assessment (see next section) introduced the possibility of a selection effect on the post-test, nullifying the possible advantages of randomization. An ANCOVA controlling for initial effort was chosen to address the issue of possible regression towards the mean that may be associated with non-randomization (Campbell & Kenny, 1999). Post-intervention perceived effort was entered as the dependent variable, while pre-intervention perceived effort was entered as the covariate. The analysis examined the independent effects of each condition on post-intervention effort, with the descriptive-norm, injunctive-norm, personal-reason, and team-reason conditions entered as the between-subjects (independent) variable.

3.3 Results

Fewer participants (n = 81) completed the post-experiment assessment (64.3% retention rate). These participants were members of 22 teams, with an average of 3.6 participants per team (range 1-

[1] To address intent to treat, analyses also were conducted with these three participants included (N =81), and results did not differ from what is presented.

6). The distribution of participants among groups varied slightly across the conditions at the post-testing (descriptive norms, n = 18; injunctive norms, n = 18; personal reason, n = 22; team reason, n = 23). In addition, those who remained in the study had similar demographics to the full sample; female (n = 67, 82.0%), mean age of 34.0 years (SD = 9.2, range = 22-60), playing in the city volleyball league for approximately 7.9 years (SD = 7.1), and on their current team for an average of 5.3 years (SD = 5.0). As noted above, 3 participants did not recall receiving any messages, so were deleted from the main analyses.

3.3.1 Preliminary Analyses

Prior to conducting the main analyses, data were screened for outliers using histograms and standardized scores, as well as checked for normality. No outliers were found; however, effort variables were found to be substantially negatively skewed (Time 1 z-score = -3.34, Time 2 z-score = -4.20). As data are typically considered to be within acceptable limits of skewness if the Z values do not exceed $\pm$ 2.0 (Vincent & Weir, 2012), results suggest that the distribution of the sample is non-normal at an alpha level of .01. Therefore, as skewness was significantly different from zero, transformations were completed (reflection and logarithm; Tabachnick & Fidell, 2011). Analyses were conducted on both the raw and transformed data. As no differences emerged when examining the results from the raw and transformed data, the analyses using the raw scores were retained for ease of interpretation. As might be expected in a sport setting, the overall mean for effort was high at both pre- (M = 7.75, SD = .96) and post-intervention (M = 7.89, SD = 1.02), and was moderately correlated (r = .61, p < .001).

Before testing the hypothesis, a one-way MANOVA was used to test for differences between the conditions on the message quality variables (i.e., believability and persuasiveness of messages). The overall MANOVA was not significant, Pillai's Trace F (12, 210) = 1.44, p > .05 (see Table 3.1). Similarly, an ANOVA was conducted to test for differences between conditions on the number of

messages read (M = 3.12). Results were non-significant, F (3, 70) = 2.59, p > .05. Together, these results indicated that message quality and the number of messages received were similar across conditions.

3.3.2 Effects of Normative and Non-Normative Messages on Effort

The ANCOVA with all four conditions (descriptive norm, injunctive norm, personal reason, and team reason) as the between-subjects variable revealed a main effect for condition, F (1, 73) = 4.01, p = .01, with a η_p^2 = .14, indicating a strong effect according to Cohen (1969), where η_p^2 values greater than .1379 are considered a large effect size. In terms of the covariate, pre-intervention effort was related to post-intervention effort, F (1, 73) = 54.48, p < .001, η_p^2 = .43.

A post-hoc examination of the pairwise comparisons, using Least Significant Difference, revealed that perceived effort was different in the two normative conditions when compared to the non-normative personal reason condition, after controlling for initial effort perceptions (see Table 3.1 for adjusted means). In line with the hypothesis, those receiving the descriptive norm (M_{adj} = 8.07) message reported greater frequency of maximal effort versus those receiving the personal reason (M_{adj} = 7.41) message (p = .011, 95% CI [.15, 1.16], estimated Cohen's d = .85).

Table 3.1 Means and Standard Deviations of Perceived Effort and Manipulation Check Means

Condition	Post-Message Effort		Manipulation Checks		
			Messages Received	Believability	Persuasiveness
	Mean	*SD*	Mean	Mean	Mean
Descriptive Norm	8.07	.93	2.72	4.89	3.44
Injunctive Norm	8.22	.91	3.28	5.24	3.41
Personal Reason	7.41	1.30	3.38	5.14	4.05
Team Reason	7.79	.83	3.06	5.20	4.25

Notes. Effort rated on a 1- to 9-point Likert scales. Means are adjusted based on the covariate, pre-intervention effort = 7.79. Believability and persuasiveness were measured on a 1- to 7-point Likert scale.

Similarly, those receiving the injunctive norm (M_{adj} = 8.22) message reported greater effort than those receiving the personal reason message (p = .002, 95% CI [.30, 1.30], estimated Cohen's d = 1.03). Of note, there were no differences between those receiving the descriptive norm message and those who received the injunctive norm message (p > .05, 95% CI [-.67, .38], estimated Cohen's d = .26).

In terms of the team-reason condition, player's self-reported effort for those receiving the non-normative team reason (M_{adj} = 7.79) message did not significantly differ from either those receiving the descriptive norm (M_{adj} = 8.07, p > .05, 95% CI [-.22, .78], estimated Cohen's d = .37), or the injunctive norm (M_{adj} = 8.22, p > .05, 95% CI [-.07, .93], estimated Cohen's d = .56) message. Further, there was no significant difference in self-reported effort for those receiving the non-normative team reason message and the non-normative personal reason message (M_{adj} = 7.41, p > .05, 95% CI [-.84, .10], estimated Cohen's d = .48).

3.4 Discussion

This study experimentally examined the influence of normative and non-normative messages on perceived effort in sport. Guided by focus theory (Cialdini et al., 1990), and evidence in a physical activity setting (Priebe & Spink, 2012), it was hypothesized that exposure to normative messages (descriptive and injunctive) would have individuals reporting greater perceived frequencies of maximal effort when compared to non-normative messages related to personal reasons.

Results supported the hypothesis, as exposure to normative information was accompanied by greater perceptions of effort frequency compared to exposure to information highlighting personal reasons for working hard. Thus, exposure to messages related to an individual's perception of others' effort, as well as others' approval of effort, led to greater reported effort when compared to non-normative messages promoting working hard to improve one's skills. While aligning with previous research finding a positive relationship between physical activity and the receipt of

normative versus non-normative personal reasons messages (Priebe & Spink, 2012), these findings also add to results from previous correlational findings (Spink et al., 2013) to the experimental manipulation of norms in a sport setting.

3.4.1 Descriptive Norms

In relation to descriptive norms specifically, these findings add to previous research in sport, which found that individuals' perceptions of their teammates' effort was related to their own effort (Spink et al., 2013). Further, the positive impact of norms on behaviour is similar to results in other contexts (i.e., energy conservation, Nolan, Schultz, Cialdini, & Goldstein, 2008; healthy eating, Robinson et al., 2014) where exposure to descriptive norm messages positively influenced behaviour. Results were in a similar direction, and supported the stronger effect of descriptive norm messages on behaviour compared to non-normative messages found in the activity area (Priebe & Spink, 2012) to a sport setting. In this study, information about the behaviour of others in the league was found to positively influence individuals' own perceived effort. In comparison, information about working hard to improve one's skill level (i.e., personal reason) resulted in less reported effort. As descriptive norms are thought to motivate behaviour through providing cues as to appropriate behaviour (Cialdini et al., 1990), the findings suggest that providing individuals with information about how hard others around them were working resulted in individuals reporting higher frequencies of maximal effort.

3.4.2 Injunctive Norms

The positive relationship between injunctive norms and reported effort supports research in other areas where exposure to injunctive norm messages appeared to influence behaviour (deGroot, Abrahamse, & Jones, 2013; Mollen, Rimal, Ruiter, Jang, & Kok, 2013). Of interest, however, the current result contrasts with research examining injunctive norm messages on performance of a physical activity task (Priebe, 2013). The inconsistent results in the two different activity settings

(sport teams versus physical activity) may be explained through theory (Cialdini et al., 1990), as injunctive norms are thought to be relevant in settings where there are social consequences associated with conforming to the norm. Keeping in mind that it is typically assumed individual player effort is tied to team performance and success, it is plausible that individuals exposed to an injunctive norm message indicating that others approved of them working hard were motivated to gain approval from others by exerting effort. This is supported by research, which has indicated that a lack of effort has clear social consequences in sport (Munroe et al., 1999; Vazou et al., 2005). Although these results provide preliminary support for the use of injunctive norm messages in sport, additional research is required in the form of replication and extension to other sport settings.

3.4.3 Non-Normative Messages

Although no hypotheses were advanced regarding exposure to team reason messages, it is worth noting that messages emphasizing team reasons for working hard produced perceptions of effort that did not significantly differ from the normative messages. This may not be surprising as many popular sport sayings portend the importance of the team (e.g., TEAM = Together Everyone Achieves More), and thus messages about working hard to achieve a team goal might be expected to influence individual motivation. Indeed, the finding that perceived frequency of effort for those individuals in the team-reason condition was similar to the normative conditions suggests that providing a message to work hard for the team may be equally beneficial.

However, examination of the post-message means surrounding perceived effort levels suggests a slightly different interpretation. When taking the covariate of pre-intervention effort into consideration (M = 7.79), those receiving messages motivating them to work hard to help their team win reported similar levels of self-reported effort following the message (M_{adj} = 7.79). It may be that promoting effort to help the team win may be ingrained within the sporting environment, and thus

this "given" was not associated with an overall change in how frequently individuals reported exerting maximal effort.

3.4.4 Strengths

This study had a number of strengths. The experimental design was used to build upon previous correlational work (Spink et al., 2013) by examining causal hypotheses. Also, this study added to previous results examining physical activity levels (Priebe & Spink, 2012) by detecting a similar finding for descriptive norm messages in a different setting (i.e., sport). The results suggest that the effective use of descriptive norm messages can be generalized across these two settings. By using different populations and methodologies, this set of studies provides a more diversified empirical evidence base supporting the use of focus theory in the activity setting.

Further, the examination of injunctive norms added to the extant literature in the sport setting. This inclusion was in line with the suggested distinction between descriptive and injunctive norms as outlined in focus theory (Cialdini et al., 1990). In this study, injunctive norms were examined in a setting (sport) where social sanctions were expected to be more important in relation to the outcome (i.e., effort; Munroe et al., 1999). In addition, a novel non-normative reason that would be suited to sport (i.e., team reason) was examined. As it might be surmised that team goals could be perceived to be important motivators of behaviour in sport, messages prompting individuals to work hard in order to help the team win (i.e., team reasons) were examined to broaden the consideration of non-normative reasons influencing behaviour. Although no hypothesis was advanced, the finding that normative messages did not differ from the non-normative team reason messages might not be a surprise given the importance of team goals in sport (Widmeyer & Ducharme, 1997)

The assessment of message quality (i.e., believability and persuasiveness) also strengthened the methods, in that results showed that messages were believable (M = 5.12 on a 7-point scale), moderately persuasive (M = 3.82 on a 7-point scale), and did not vary significantly across conditions.

To enhance believability and persuasiveness, participants were told that message content was based on results from the initial survey. As there were no differences between the conditions on message quality, the results provide additional support that the differences in perceived effort found between the groups were likely due to the normative part of the message versus the quality of the messages. Similarly, participants across conditions remembered receiving a similar number of messages (M = 3.12). As repetition of persuasive information can increase its effect (Harkins & Petty, 1981), it is less likely that the differences found between conditions can be attributed to a methodological issue such as a different number of messages being read across conditions.

3.4.5 Limitations and Future Directions

Despite these strengths, there were some limitations, which provide suggestions for future research. The present study did not include a control group. Having a control condition would strengthen the design as the control group would serve as a baseline measure at both pre- and post-intervention, and thus would also allow for a direct assessment of how effective normative messages are versus no intervention. Missing a no-treatment control condition may not have presented a serious threat as it has been demonstrated previously that normative messages impact individual activity behaviour over and above a no-message control group (Priebe & Spink, 2012, 2014). However, including an attention-control condition might be useful as it would allow a determination of whether normative messages influenced behaviour relative to any kind of message.

Another limitation relates to the self-reported nature of effort. As participants reported the frequency of their own effort, results should be interpreted as perceptions, and not participants' actual effort. In addition, as effort was relatively high across all conditions (see Table 1), results should be viewed in terms of degree of effort. It may be that social desirability was a factor, such that being in a research study assessing effort may have caused individuals to rate their effort high. As another alternative, these high effort levels may be a reflection of '100% effort' being a valued

norm in sport associated with social sanctions (Munroe et al., 1999). This may have prompted individuals to report high levels of effort. However, it is likely that this possible social desirability effect would be present for participants in all conditions. Therefore, the fact that results differed by condition lends meaningful support to the idea that normative messages were related to greater perceptions of effort. Future research might want to use other methods of assessing effort and work output (e.g., having team members rate the effort of teammates) in order to minimize possible alternative explanations such as method variance and social desirability (Podsakoff, MacKenzie, Lee, & Podsakoff, 2009).

Injunctive norms are thought to motivate behaviour through the inclusion of social sanctions (Cialdini et al., 1990). Although messages were developed based on theoretical tenets, and included information about the approval of others, no assessment was made of participant perceptions of impending social sanctions. Future research would benefit from assessing the strength of perceived social sanctions associated with the message.

Last, as the participants were primarily female, and effort was examined in only one interdependent sport (volleyball), results are limited to this population and context. Future directions might include examining other sports, including individual sport teams (e.g., swimming, golf). In individual sports, athletes are exposed to different types of interactions with teammates when compared to the interdependent sport used in this study (Evans, Eys, & Bruner, 2013). Thus, the effect of social norms on behaviour may differ. Within individual sport teams, it may be that if group members directly compete with their teammates (e.g., collegiate swim team), social norms for working hard would differ than if group members are working towards a group-level outcome (e.g., team title in collegiate wrestling; Evans et al., 2013). Identifying the influence of norms in these different individual sport structures awaits further research.

3.4.6 Conclusion

Despite these limitations, results appear to support a link between norms and effort in sport. Results support the directional relationship between messages conveying normative information and perceived frequency of maximal effort in sport. One implication of these results is that in sport where the influence of others would seem pertinent (Latané, 1981), individual behaviour may be significantly impacted by the perception of what others are doing within that environment (i.e., normative information). Consequently, if results can be replicated, sport practitioners and coaches may want to be more cognizant of the influence of others (e.g., teammates, opponents). Potentially, coaches may wish to use messages surrounding others' effort, and approval of effort, as a motivational tool to encourage athletes to work harder in a sporting environment.

3.5 Bridge to Study 3

As one of the tenets of focus theory (Cialdini et al., 1990) suggests that two types of norms influence behaviour, both descriptive and injunctive norms were examined in Study 2. In addition to the distinction between descriptive and injunctive norms, the other main tenet of focus theory indicates that normative information only has the potential to influence individuals when the information is focal (salient) in the individual's consciousness. Only one study to date has attempted to manipulate salience in an activity setting (Priebe, 2013). It was found that information surrounding the similarity of the reference group did not increase the salience of a descriptive norm message. However, as this was an initial attempt at making a norm salient to individuals in an activity setting, additional research appears warranted. As such, the purpose of Study 3 was to address this gap by drawing attention to normative information through the use of positive outcome expectations.

CHAPTER 4

STUDY 3: THE EFFECT OF MANIPULATING DESCRIPTIVE NORMS AND OUTCOME EXPECTATIONS ON EXERCISE BEHAVIOUR

4.1 Introduction

Engaging in recommended amounts of physical activity is associated with numerous health benefits, including the prevention of several chronic diseases (e.g., cancer, cardiovascular disease, osteoporosis) and a reduced risk of premature death (Warburton, Nicol, & Bredin, 2006). However, national data using objective measures have indicated that only 15% of Canadian adults are meeting activity guidelines in relation to moderate and vigorous physical activity (Colley et al., 2011). While multiple reasons have been advanced as causes for being less active (Seefeldt, Malina, & Clark, 2002), given people's busy lives, competition with other valued choices such as work obligations, spending time with family, and social commitments would appear to be a factor worth examining (Jung & Brawley, 2011).

For young adults who are students, it has been recognized that the high demands associated with pursuing a university degree compete with time for purposeful physical activity (Gyurcsik, Spink, Bray, Chad, & Kwan, 2006). One particularly demanding time faced by university students is the final examination period. Indeed, research has identified greater levels of difficulty managing exercise and academics during the examination period (Jung & Brawley, 2013).

The finding that students struggle to manage exercise and academic demands concurrently during exam periods suggests that pursuing one goal (exercise) may be interfering with the successful pursuit of the other (academics). However, this need not be the case, as juggling multiple demands does not have to be counterproductive. In fact, it has been suggested that the pursuit of one goal can support the achievement of another goal (Jung & Brawley, 2010; McKee & Ntoumanis, 2014).

This could be the case when pursuing exercise and academic goals, as several reviews of the literature have established that engaging in exercise has positive effects on cognitive performance (Brisswalter, Collardeau, & René, 2002; Etnier et al., 1997; Hillman, Erickson, & Kramer, 2008; Tomporowski, 2003), which could be beneficial to one's academic performance during exams. Indeed, empirical support has established a positive link between engagement in physical activity and academic achievement (e.g., Trockel, Barnes, & Egget, 2000; Trudeau & Shepard, 2008). Those who were more physically active also were more likely to achieve better grades. Thus, determining ways to motivate individuals to maintain their exercise during a demanding time (i.e., final exams) would seem warranted.

4.1.1 Descriptive Norms and Activity

A potential social factor that has been identified as relating to individual physical activity behaviours is the perception of others' behaviour, known as the descriptive norm (Priebe & Spink, 2011, 2012, 2014). As highlighted in focus theory (Cialdini et al.,1990), descriptive norms refer to an individual's perception about the prevalence of others' behaviour (i.e., how do most individuals behave in a situation). In relation to exercise, the theory suggests that when individuals perceive that many of their peers are being active, they would be more likely to be active compared to those who perceive few peers are active. Indeed, a positive relationship between descriptive norms and physical activity levels has been found (Priebe & Spink, 2011).

4.1.2 Norm Salience

Not only does focus theory highlight that descriptive norms will impact behaviour, it also suggests that norms will motivate behaviour only when the norm is salient, or focal, to the individual (Cialdini et al., 1990). Individuals need to be focused on the information contained in normative messages in order to act in norm-consistent ways (e.g., Berkowitz, 1972; Berkowitz & Daniels, 1964), and that only occurs when the normative information is focal (salient) in one's consciousness.

Researchers have attempted to initiate norm salience in multiple ways, such as utilizing confederates (Cialdini, Kallgren, & Reno, 1991), altering the environment (Cialdini et al., 1990), and providing positive versus negative messages (Cialdini et al., 2006). In a study assessing littering rates (Cialdini et al., 1990), it was found that individuals who observed a confederate dropping litter into a clean environment were less likely to litter than individuals who observed a confederate who did not litter. In this example, it was assumed that the confederate dropping litter into the clean environment focussed the individual's attention on what others had been doing, making the anti-littering norm salient (i.e., the clean environment).

To date, only one study has tried to manipulate norm salience within the activity setting (Priebe, 2013). In that study, similarity of the reference group was manipulated to try to enhance the salience of a normative message. It was thought that norms about the activity of a group to which one feels similar (i.e., coworkers) would have stronger effects than norms of a less similar group (i.e., office workers in general). However, results did not support this speculation, as there were no differences in activity behaviour when individuals received messages about more or less similar reference groups (Priebe, 2013).

4.1.3 Norms and Outcome Expectations

Another possible method to enhance the salience of normative messages in physical activity involves drawing attention to the positive benefits of engaging in exercise during an exam period. One way to do this could be the use of relevant outcome expectations. As highlighted in social cognitive theory (Bandura, 1986, 1998), outcome expectations reflect an individual's perceptions that a given behaviour will lead to specific outcomes (e.g., physical activity will lead to weight loss). Both positive and negative expectations can exist, and consequently serve as either incentives or disincentives, respectively, of engaging in behaviour. Behaviour is more likely to occur when the

individual is efficacious and perceives that the behaviour will lead to valued positive outcomes (Bandura, 1986, 1998).

As research has found that performing well academically (e.g., getting an A in the class) is a valued goal of university students (Okun, Fairholme, Karoly, Ruehlman, & Newton, 2006), the outcome expectation highlighted in this study surrounded the positive benefits of engaging in moderate and vigorous physical activity on cognitive functioning, and ultimately, exam performance. Specifically, if an individual believes an outcome is more likely (e.g., perform well on exams) based on engagement in a behaviour (e.g., physical activity), then they are more likely to engage in that behaviour. On the other hand, if an individual believes an outcome is less likely (e.g., no or little influence on exam performance) based on engaging in a behaviour (e.g., physical activity), then they are less likely to engage in that behaviour.

In terms of how outcome expectations might impact norm salience, it follows that a descriptive norm coupled with a positive outcome expectation for that behaviour should increase compliance with the norm. As norms only motivate behaviour when they are activated (Cialdini et al., 1990), providing individuals with information about the benefits of a behaviour (i.e., positive outcome expectations) may lead them to pay closer attention to the normative information, and thus be more likely to act on that information. As an example, an individual interested in doing well on her/his exams is more likely to pay attention to, and act on, normative information that many others have maintained their activity, if it also is pointed out that exercising is an effective way to enhance final exam grades.

In support of this speculation, research has found that the effect of descriptive norms on alcohol use became stronger as individuals' positive outcome expectations increased (Dieterich, Standly, Swaim, & Beauvais, 2013). When individuals perceived that similar others consumed alcohol often, and also perceived positive benefits to the self (i.e., "drinking alcohol makes me feel

good"), they were more likely to drink alcohol and engage in binge-drinking compared to those who perceived lots of others drinking, but perceived less personal benefits. These correlational findings provide preliminary support for a possible interaction between descriptive norms and outcome expectations. Yet, no research to date has manipulated descriptive norms and outcome expectations simultaneously in a physical activity setting to examine how these two variables might interact to influence exercise maintenance.

4.1.4 Purpose and Hypothesis

The overall purpose of Study 3 was to assess the interaction between descriptive norms and positive outcome expectations on engagement in moderate and vigorous physical activity over an exam period. Based on focus theory (Cialdini et al., 1990) and previous research (Dieterich et al., 2013), it was hypothesized that individuals exposed to messages describing a high descriptive norm associated with a high positive outcome expectation would report greater levels of physical activity over the exam period than those exposed to a high descriptive norm associated with a low positive outcome expectation.

4.2 Methods

4.2.1 Participants and Design

Regularly active participants who were going into a final exam period were recruited from a mid-sized university in Western Canada. Inclusion criteria included participants who achieved the recommended 150 minutes of moderate and vigorous physical activity during a typical 7-day period prior to the exam period and had experienced a reduction in their physical activity during a past exam period. Further, participants were required to have greater than two exams scheduled during the exam period when the study was conducted, and be considered a full-time student (i.e., taking more than 3 courses). Participants also were excluded if they were a member of a varsity team, as

these individuals would have extensive weekly hours of sport-specific training during the regular school year, with reduced hours or cancelled practices during final exams.

Participants (N = 153) were mostly female (N = 101, 66.4%), had an average age of 21.0 years (SD = 2.8), had been attending university for 2.6 years (SD = 1.3), and reported having an average of 3.9 final exams (SD = 2.75). Of these, 66 did not meet the inclusion criteria, leaving 87 participants. Similar to the larger sample, a majority of the final sample was female (N = 48, 65%), had an average age was 20.61 years (SD = 2.34), and had been attending university for an average of 2.7 years (SD = 1.3). Participants also reported writing an average of 4.2 (SD = .90) exams during the final examination period.

4.2.2 Procedures

After approval from the University Ethics Review Board was attained, recruitment occurred in one of two ways. First, a researcher attended upper-year university undergraduate courses and provided an overview of the study procedures. Interested students provided their e-mail address, and were subsequently e-mailed the link to the initial online survey two weeks prior to the final exam period. As a second recruitment tool, an advertisement with the link to the initial online survey was placed on the university's student portal two weeks before final exams began. Interested students clicked the link provided to access the initial survey. Once informed consent was obtained, this initial survey consisted of demographics (sex, age, student status, number of forthcoming final exams), reporting of the date of their final exam, a physical activity measure, and their intentions to maintain their activity over the forthcoming exam period. The survey took participants approximately 5 to 10 minutes to complete.

Participants who met the inclusion criteria (n = 87) were randomly assigned to one of four conditions: (1) high descriptive norm/high positive outcome expectation (n = 21), (2) high descriptive norm/low positive outcome expectation (n = 24), (3) low descriptive norm/high positive

outcome expectation (n = 21), and (4) low descriptive norm/low positive outcome expectation (n = 21). Four days prior to the beginning of the exam period, participants were emailed a link to their specific manipulation, which included the normative message.

This normative message differed between groups on two dimensions: (1) the descriptive norm, indicating that either many (high DN) or few (low DN) students in the past had been able to maintain their activity levels during exams, and (2) positive outcome expectations, which suggested that many (high positive OE) or few (low positive OE) of those who maintained their activity in the past during the exam period performed equally well or better on their exams than during the semester. The high and low values for the descriptive norm information were created specifically for this study. The values were set with a view to differentiate the normative information presented to the groups while still being believable to the participants. In selecting the values, it was assumed that a very high value for a descriptive norm (e.g., that 85% maintained their activity) would be less believable (as being active is typically a very public venture and participants might be suspicious of a value that appeared too high) than the value used in this study (i.e., 63%), which was not as extreme, but still indicated a majority. At the lower end, a value of 13% was used. Further, it was assumed that the difference between 13% and 63% would meaningfully differentiate the normative perceptions between groups while at the same time remaining believable.

The information for the positive outcome expectation segment of the messages was based on literature providing evidence of the positive relationship between exercise and cognitive functioning as well as academic performance (e.g., Etnier et al., 1997, Trudeau & Shepard, 2008). Similar to the descriptive norm manipulation, the numbers for the positive outcome expectation were selected to meaningfully differentiate perceptions of the low and high groups (10% and 90%, respectively). Further, given that the relationship between exercise and cognitive functioning is likely less

recognized, an extremely high value (i.e., 90%) was deemed appropriate. An example message (high DN/low positive OE) was as follows (see Appendix N for all messages):

> "Engaging in moderate-to-vigorous physical activity regularly has many benefits, including advantages associated with academic performance. For instance, it has been found that exercising enhances an individual's cognitive functioning. In particular, university students who exercise for at least the recommended 150 minutes per week are able to concentrate for longer, they have higher energy levels, and they generally perform better on academic exams. So how many students at the University of Saskatchewan maintain their activity over the two-week exam period? In a study conducted last year at the U of S, it was found that **63%** of students were able to maintain their physical activity levels during the exam period. Of those who were able to maintain their activity levels, **10%** reported grades on the final exam that equaled or surpassed grades obtained during the term. Join your fellow students in maintaining your exercise patterns over the exam period!"

After participants read the message and were thanked for their time, they were reminded that they would receive a final survey once all their final exams were completed.

Based on the date of participants' last exam, the email link was sent the day following that final exam. The survey attached to the link asked participants to recall their physical activity over the exam period and also included manipulation check questions. This survey took approximately 5 minutes to complete. Participants were thanked for their participation, and once all surveys were completed, participants were debriefed via email. In total, 74 participants accessed and completed all three online links (i.e., surveys, message manipulation), for an 85% completion rate from eligible participants. These were the individuals included in the final analyses.

4.2.3 Measures

Daily physical activity. In order to assess physical activity, the Modifiable Activity Questionnaire (Kriska et al., 1990) was utilized. This measure required participants to choose activities they engaged in during the time period of reference. For each activity chosen, participants recorded how many times they engaged in that activity during the specified time-period (frequency), the average number of minutes being active each time (time), and how hard they perceived working

(intensity). Frequency and time were open-ended questions, while intensity was assessed on a 3-point scale: light (slight change from normal breathing), moderate (above normal breathing), or vigorous (heavy breathing). Reliability and validity of the measure have been provided for use in adult populations (Kriska et al., 1990; Vuillemin et al., 2000).

Given that the messages targeted exercisers who accumulated the recommended amount (150 minutes+) of moderate and vigorous activity to achieve health benefits during a typical week (Tremblay et al., 2011), participants were asked to only report their moderate and vigorous intensity activities. To measure *baseline physical activity* during the first survey, participants were asked to recall a typical week (7-day period) during the past four weeks. For activities that were identified as having a moderate or vigorous intensity, frequency and time were multiplied together. The numbers for each activity were then summed, and divided by seven to get a total number of *minutes per day* of physical activity (hereafter called "baseline average daily PA"). Similarly, to assess physical activity *over the exam period*, participants were asked to recall the activities engaged in during their specified exam period (i.e., from the first day of the university exam period until their final exam date). Frequency and time were multiplied together for those activities identified as moderate and vigorous, summed, and then divided by the number of days during that specific participant's exam period (hereafter called "exam average daily PA"). To ensure there was congruency in the measure of baseline activity (i.e., over a typical 7-day period) and exam period activity (i.e., ranged from 6-15 days long), this method was chosen as the length of each participant's exam period differed. Thus, examining average *daily* minutes of activity was deemed the most appropriate to compare physical activity across participants and conditions.

Intentions to maintain physical activity. Intentions were assessed by asking two questions about participants' intentions to be active over the exam period. These two items were developed specifically for this study. Participants rated on a 9-point scale their agreement (1 = *strongly*

disagree, to 9 = *strongly agree*) to the following items: "I intend to maintain my current physical activity routine over the exam period," and "I plan to keep up with my exercise routine over the exam period." The two items were averaged and found to be internally consistent ($\alpha = .94$).

Manipulation checks. To assess whether the messages were appropriate and similar between groups, participants were asked to complete manipulation check questions. Participants were asked four questions in relation to how *motivating* the message was, its *believability*, *persuasiveness,* and whether the information in the message was *easy to understand*. These four questions were assessed on a 7-point Likert scale, ranging from 1 = *strongly disagree*, to 7 = *strongly agree.*

4.2.4 Data Analysis

For those who accessed and completed all portions of the study ($N = 74$), a 2 (high DN, low DN) X 2 (high positive OE, low positive OE) ANCOVA was used to test whether the intervention groups differed in their daily exercise behaviour over the exam period. In this analysis, baseline average daily PA was entered as the covariate, and exam average daily PA was entered as the dependent variable. It was deemed important to control for typical levels of activity by covarying out initial activity levels before examining the effects of the messages on self-reported behaviour.

4.3 Results

4.3.1 Preliminary Analyses

Data were screened for outliers using histograms and standardized scores. Five outliers (greater than 3 standard deviations above the mean for either baseline average daily PA or exam average daily PA) were found for participants' physical activity levels: 3 from the high DN/low positive OE condition and 1 each from the low DN/high positive OE and the low DN/low positive OE condition, respectfully. These participants were deleted from any further analyses leaving 69 participants for the analyses. Final distribution among groups was as follows: high DN/high positive

OE condition = 18, high DN/low positive OE condition = 18, low DN/high positive OE condition = 15, and low DN/low positive OE condition = 18. After excluding these extreme outliers, normality was checked, and all variables were found to be normally distributed.

Before testing the hypothesis, a one-way MANOVA was used to test for differences between the conditions on the message quality variables (i.e., motivation, believability, persuasiveness, and understanding). The overall MANOVA was not significant, Pillai's Trace F (12, 189) = 1.08, p = .38, suggesting that message quality did not differ between conditions. Overall, messages were understandable (M = 6.0) and believable (M = 5.7), as well as moderately motivating (M = 4.05) and persuasive (M = 4.09). All were measured on a 7-point scale.

In relation to exam period characteristics, separate ANOVAs showed that conditions were similar (see Table 4.1 for overview) in terms of the average number of exams, F (3, 65) = 1.73, p = .17, the length of the exam period (i.e., number of days), F (3, 65) = 1.44, p = .24, as well as the density of exams (i.e., average number of exams divided by the length of the exam period), F (3, 65) = 2.21, p = .10. Last, an ANOVA indicated that intention to maintain physical activity was not significantly different between conditions, F (3, 65) = 1.36, p = .26. This finding suggests that, prior to the exam period, groups had similar intentions to be active during the exam period.

Table 4.1 Manipulation Check, Exam Characteristics, and Intention Means and Standard Deviations by Condition

	High DN/ High Positive OE	High DN/ Low Positive OE	Low DN/ High Positive OE	Low DN/ Low Positive OE
	Mean (SD)	*Mean* (SD)	*Mean* (SD)	*Mean* (SD)
Manipulation Checks				
Motivating	3.93 (1.27)	4.58 (1.86)	3.62 (1.33)	3.80 (1.66)
Believability	5.79 (1.31)	6.00 (.95)	5.33 (1.23)	5.53 (1.25)
Persuasive	4.23 (1.48)	4.57 (1.40)	3.67 (1.18)	3.67 (1.76)
Understanding	5.86 (1.17)	6.29 (1.19)	5.87 (1.25)	5.80 (1.21)
Exam Characteristics				
Number of Exams	4.28 (.83)	3.78 (.94)	4.40 (.74)	4.28 (.96)
Length of Exam Period	13.67 (2.30)	13.61 (2.45)	13.53 (2.07)	12.33 (2.11)
Exam Density	.33 (.11)	.28 (.06)	.34 (.09)	.36 (.11)
Intention to Maintain PA	6.61 (2.03)	7.18 (1.58)	6.80 (1.79)	6.00 (2.10)

Notes. DN = descriptive norms, OE = outcome expectation, PA = physical activity. Manipulation checks were rated on a 1- to 7- point Likert scale. Intentions rated on a 1- to 9-point Likert scale. Number of exams and length of exam period were open-ended questions, while exam density was calculated by dividing the number of exams by the length of exam period.

4.3.2 Effects of Descriptive Norms and Positive Outcome Expectations on Exam Period Average Daily Physical Activity

Neither the main effect for descriptive norms, F (1, 64) = .24, p = .63, nor positive outcome expectations, F (1, 64) = 2.20, p = .14, was significant. However, as expected, the descriptive norm-positive outcome expectation interaction term was significant, F(1, 64) = 4.17, p = .04. Using values provided by Cohen (1969), the η_p^2 value of .06 indicated a medium effect size. Mean minutes of moderate and vigorous physical activity per day for each condition are shown in Table 4.2.

Table 4.2 Pre- and Post-Intervention Reported Physical Activity Levels by Condition

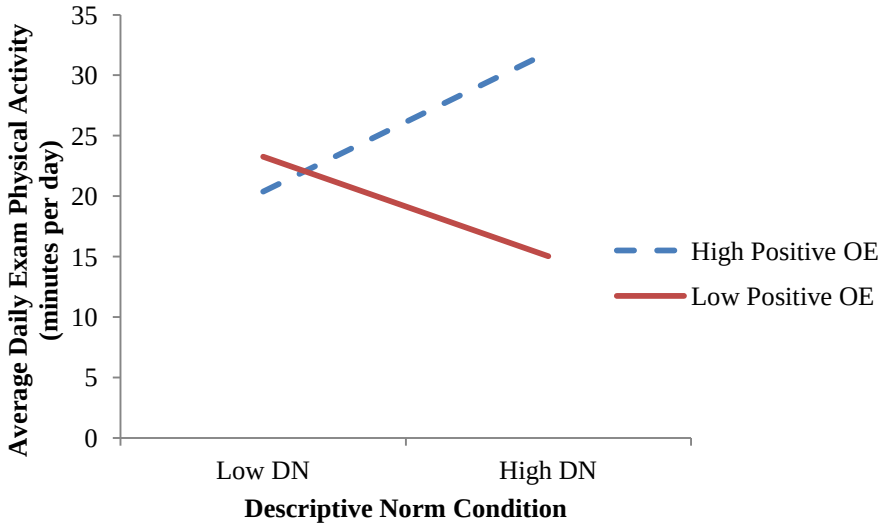
	Baseline Daily Average PA		Exam Daily Average PA	
Experimental Condition	*Mean*	*SD*	*Mean*	*SD*
High DN/ High OE	41.35	14.14	31.89	25.39
High DN/ Low OE	36.23	16.52	15.02	12.72
Low DN/ High OE	39.24	13.82	20.38	13.93
Low DN/ Low OE	40.5	17.04	23.25	17.69

Notes. DN = descriptive norms, OE = positive outcome expectation, PA = physical activity (measured in minutes per day).

Post-hoc tests of the adjusted means revealed that when the descriptive norm was low, exercise levels were not significantly different between the high and low positive outcome expectations groups (p = .70, 95% CI [-9.80, 14.58]) (see Figure 4.1). On the other hand, when the descriptive norm was high, low positive outcome expectations resulted in less exercise compared with high positive outcome expectations (p = .013, 95% CI [3.21, 26.62]), with the effect size

(estimated Cohen's d = 0.85) indicating a strong effect. This result indicated that high norms for being active during the exam period influenced behaviour more when accompanied by high positive outcome expectations compared to low positive outcome expectations.

Figure 4.1. Interaction between Descriptive Norms and Outcome Expectations on Daily Physical Activity during Exam-Period



Note. DN = descriptive norm; OE = outcome expectation

Although all groups declined in terms of their mean activity levels from pre-exam levels, individuals in the high DN/high positive OE condition decreased their activity by approximately 23%, whereas individuals in the other conditions experienced a 48-59% drop in their activity over the exam period. Further, the difference in self-reported activity found between the high DN/high positive OE condition and the high DN/low positive OE condition was the largest, with the latter condition showing the greatest decline (59%), and hence, the least amount of activity during the exam period, per day.

4.4 Discussion

The overall purpose of this study was to examine the interaction between descriptive norms and positive outcome expectations on an individual's physical activity over a final examination period. As norms were expected to work when they were salient (Cialdini et al., 1990), positive outcome expectations were used to prime individuals to focus on the descriptive norm information. It was thought that highlighting the benefits of activity for an individual's exam performance would make the normative information highly prominent in the individual's consciousness.

4.4.1 Descriptive Norms and Outcome Expectations

In line with the hypothesis, a significant interaction was found between descriptive norms and positive outcome expectations. When being told that many others maintained their activity was combined with the message that positive academic benefits were gained by many of those who were active, individuals reported greater physical activity levels over the exam period compared to those who were told that few of those who maintained their exercise experienced the benefits associated with exercising during that period.

Focus theory highlights norms as influential in affecting behaviour only when that norm is focal (salient) in one's consciousness (Cialdini et al., 1990). Thus, it seems that the perception that others were exercising positively influenced an individual's behaviour only when the positive benefits of the behaviour experienced by many others also were emphasized. On the other hand, if individuals perceived that few benefited from exercising during the exam period, they were less likely to exercise. As research has found that during high-stress academic periods (i.e., final exams), exercise behaviour declines (Weidner, Kohlmann, Dotzauer, & Burns, 1996), the present results suggest that providing a message highlighting that many others exercised during exams, as well as information about the positive benefits accrued by many who exercise would be one possible way to motivate individuals to engage in physical activity during an exam period.

4.4.2 Physical Activity Intentions

In addition to having similar physical activity levels prior to the exam period, groups also did not differ on their intentions to maintain their activity routines during exams. This suggests that individuals likely were similarly motivated to maintain their activity levels at the outset of the study. In fact, individuals had relatively moderate to strong intentions to sustain their activity during the exam period (M = 6.63 on a 9-point scale). However, it was the individuals who were told that many students maintained their exercise levels, and of those, many gained the benefit of doing well on exams, who were more likely to maintain a higher level of physical activity. Intentions have been identified as an important predictor of behaviour (e.g., Ajzen, 1985). However, whether or not intentions are translated into action is referred to as the "intention-behaviour gap" (Sheeran, 2002), and a sizeable gap has been found in physical activity studies (Rhodes & de Bruijn, 2013). This also may be the case for this study, as high intentions across the conditions did not correspond with similar exercise patterns during the exam period. However, as intentions were assessed primarily to ensure that those in the different conditions had similar intentions to be active over the exam period prior to message delivery, the intention-behaviour relationship was not directly assessed.

Results also may be attributed to the timing of the intentions measure. Individuals accessed the initial survey assessing intentions approximately two weeks prior to their exam period, and behaviour was assessed up to four weeks later. As research has indicated that participants' intentions can change prior to performance of a behaviour as a result of new information (Sheeran, 2002), it may have been more effective to assess intentions closer to the exam period (i.e., less than one-week prior). Further, intentions were assessed in terms of how much individuals agreed with the statements about intending to maintain their activity. More variability in responses may have been reported if the items had assessed *how much* an individual intended (e.g., strength of intention) to maintain her/his activity over the exam period. What the findings do suggest is that, although an

individual may have high intentions to engage in a behaviour, other motivational factors need to be considered when encouraging individuals to maintain their activity.

4.4.3 Physical Activity Patterns

Results also provide information as to the exercise patterns of university students during final examinations. Recall that part of the inclusion criteria was that individuals had to report being less active during a final-exam period at some past point. In fact, all participants (N = 153) accessing the first survey indicated that they had experienced this drop in activity during exams previously, providing additional support that the reduction in physical activity during this period exists (Weidner et al., 1996). Further, the finding that all participants, regardless of message received, reported a reduction in physical activity (24-59%) highlights the difficulty individuals have in maintaining their activity patterns when faced with competing demands during exams. Although those in all conditions decreased their activity, the results provided initial evidence that normative messages that were made salient through the use of positive outcome expectations limit the decline of regular exercise during an exam period.

Another interesting observation about these results reflects the finding that individuals receiving the high descriptive norm and low positive outcome expectation message were the least active over the exam period (M = 15.02 minutes of exercise per day). As these individuals were told that a majority of students were able to maintain their activity, but few gained an academic benefit, it may be that highlighting a lack of that benefit might make the normative information more focal for the wrong reason. That is, one may pay attention to the fact that many others are exercising, but few are getting the academic benefits. Why would one exercise if those who are exercising are not seeing any positive academic outcomes? In retrospect, it may have been informative to ask participants whether they believed that being active during the exams would help or hinder their academic performance. This awaits future research.

4.4.4 Strengths

This study adds to the literature by experimentally testing the interaction between descriptive norms and positive outcome expectations. Stemming from correlational work examining this interaction with alcohol use (Dieterich et al., 2013), descriptive norm and positive academic performance outcome expectations were both manipulated to determine their interactive effects on exercise behaviour over an exam period. This study used aspects of two theories in order to test the research question. Specifically, the hypotheses were driven by, and provided preliminary support for focus theory (Cialdini et al., 1990), such that norms were found to influence behaviour when they were ostensibly made salient. As focus theory does not explicitly state what will make a norm salient to individuals, this study also drew upon social cognitive theory (Bandura, 1986, 1998). In particular, outcome expectations were provided as a way to draw the normative information into the recipient's consciousness.

4.4.5 Limitations and Future Directions

Despite these strengths, future directions stemming from potential limitations can be suggested. As a 2 X 2 ANCOVA design was utilized, the lack of a control condition is a limitation, as results can only be interpreted in relation to the other groups. A control group would better serve as a baseline measure at both pre- and post-intervention to detect significant differences between groups that received intervention messages and those that did not. As the research question in this study concerned the interaction of descriptive norms and outcome expectations, the results still lend support to the idea that descriptive norm messages influence behaviour when made salient (Cialdini et al., 1990) through the use of positive outcome expectations (Bandura, 1986). However, as the use of a positive outcome expectation to heighten salience of the normative information is still speculative at this stage, future research should assess whether this was actually the case. Examining salience would provide further evidence as to whether highlighting the academic performance

benefits of activity is a method to be used to get individuals to pay attention to normative information about being active during an exam period.

Another limitation reflects the type of outcome expectations examined in this study. Bandura (2004) highlighted that outcome expectations can reflect both long-term (distal) or short-term (proximal) benefits. In recent activity research, proximal exercise outcomes have been defined as those occurring immediately during, or shortly thereafter, a single bout of exercise (Evans, Cooke, Murray, & Wilson, 2014). On the other hand, distal outcomes reflect expectations after days, months, or even years of physical activity. As the positive outcome expectation emphasized in this study reflected an individual's performance on academic exams as a result of exercising over the entire exam period, these might be more reflective of a distal outcome expectation. As research has indicated that individuals with proximal (i.e., immediate) outcome expectations were more physically active than individuals with distal outcome expectations (Li, 2013), the effect of normative messages on activity might be strengthened by coupling them with proximal outcome expectations. However, given the speculative nature of categorizing exam performance as a distal outcome, future researchers might want to assess whether participants perceive exam outcomes as a distal versus proximal outcome of exercising during the exam period.

Another constraint worth mentioning was how physical activity over the exam period was operationalized (i.e., average minutes per day). As the length of exam period varied between participants, physical activity was calculated by dividing individual's self-reported activity during their exam period by the number of days they were in exams. For instance, if one participant reported exercising for a total of 150 minutes over a 10-day exam period, it would equal approximately 15 minutes per day. Similarly, if another participant reported exercising for that same amount of time (i.e., 150 minutes), yet only over a 7-day period, it would equal approximately 21.4 minutes per day. These two examples demonstrate how the dependent variable (exam average daily

PA) was calculated using different time periods, and thus was not the same for all participants. However, as groups were found to have similar exam period characteristics (i.e., length of exam period, number of exams scheduled during the exam period, and how closely their exams were space), standardizing the behaviour to the same scale (exercise per day) was deemed appropriate. Further, this method was utilized in order to have corresponding values for physical activity assessed both prior to exams (i.e., typical average daily PA) and during the exam period (i.e., exam average daily PA).

In terms of the self-reported nature of exercise, the recall of individual's physical activity patterns over an extended period also may have impacted the results. As the number of days in the exam period increased (up to a maximum of a 15-day recall), participants may have had difficulty remembering specific details (i.e., activity completed, duration, and intensity) related to their engagement in exercise over the entire period. However, in order to minimize this, participants were primed to focus on moderate and vigorous activities that were completed purposefully (e.g., going to the gym, playing pick-up basketball with friends), and utilizing a measure that provided specific activity examples to help with recall (Kriska et al., 1990). Further, all groups had a similar average length of the exam period, suggesting that differences found between groups were not due to the length of recall period. Although more cumbersome for participants, and possibly raising ethical flags, future research may wish to have individuals complete a daily- or weekly-diary, or utilize objective measures (i.e., accelerometers) to assess moderate to vigorous physical activity engagement during an exam period.

Last, it is important to note that the results are only generalizable to young adults pursuing an undergraduate degree. Further, as the behaviour in question surrounded exercise over a final examination period at a university, which is thought to be a challenging time for engaging in exercise

(Jung & Brawley, 2013), it is unclear whether similar results would be found for exercise during other challenging times.

4.4.6 Conclusion

In conclusion, normative messages were found to reduce the decline in PA when individuals expected positive academic performance outcomes to emerge from attempting to maintain their exercise patterns over the exam period. In support of focus theory (Cialdini et al., 1990), the results highlighted the usefulness of making a norm salient in order to affect behaviour. Although further research is required, results provide preliminary evidence that highlighting positive outcome expectations may be a viable procedure to use to increase the salience of a normative message in the activity setting.

CHAPTER 5

GENERAL DISCUSSION

It is well documented that the behaviour of others has a strong influence on an individual's own behaviour (Asch, 1952; Latané & Darley, 1968; Milgram, 1974; Sherif, 1937). Evidence has emerged confirming that social norms influence/relate to individual behaviour in both physical activity (Priebe & Spink, 2011, 2012, 2014; Okun et al., 2002, 2003) and sport (Spink et al., 2013) settings. Guided by focus theory (Cialdini et al., 1990), the purpose of the three studies comprising this thesis was the examination of several questions surrounding the relationship between norms and individual outcomes in activity settings.

The results of Study 1 provided initial evidence for a positive relationship between the norm for prosocial behaviour and intention to return in a youth sport camp setting. Results showed that the more one perceived that a majority of group members provided encouragement and supportive behaviours to those in the group, the greater the intention to return to that group in the future. Although accounting for a smaller amount of variance in intention to return (5%) compared to other norm research in sport (Spink et al., 2013), these results provide preliminary support that the perception of what others are doing for one behaviour (prosocial) may relate to an individual's perceptions about another behavioural goal (intention to return). However, future research is needed to replicate these findings.

The second study examined the effect of normative and non-normative messages on self-reported effort in a sport setting. Adult recreational volleyball players received messages designed to motivate them to exert effort during games in a variety of different circumstances. These messages were designed to capture different reasons (normative and non-normative) for working hard. Results supported the hypothesis, such that exposure to normative messages (both descriptive and injunctive

norm) was related to greater self-reported effort when compared to messages highlighting working hard for personal reasons (i.e., to improve one's skills). These findings had a large effect size.

In Study 3, messages containing descriptive norms and positive outcome expectations were manipulated to determine their joint effects on individual activity. As one of the tenets of focus theory (Cialdini et al., 1990) indicates that norms will only influence behaviour when made salient, positive outcome expectations were used as a strategy to enhance the salience of the normative message. An interaction between descriptive norms and outcome expectations was found providing support for the theory. Individuals who received a high descriptive norm reported greater exercise levels when they also were told that many of those who exercised performed better on exams than during the term (high positive outcome expectation) compared to those who were told that few did better academically on final exam performance (low positive outcome expectation). Based on the effect size, this difference was considered moderately strong.

5.1 Contribution to the Physical Activity Literature

5.1.1 Descriptive Norms and Activity

As all three studies demonstrated relationships between descriptive norms and different outcome measures relating to activity, their collective results speak to the idea that norms may relate to a variety of outcomes and in differing contexts. As the perception of others' behaviour was found to positively relate to all three outcomes, evidence of the generalizability of descriptive norms on activity outcomes was provided.

Along with other group variables that have been linked with continued group membership (Spink, 1995; Ullrich-French & Smith, 2009), the results of Study 1 provided preliminary evidence of how perceptions of normative behaviour were associated with an individual's goal for intending to return to a group at a future time. As individual effort is thought to be an integral component of a team's performance in sport, descriptive norm messages were found to influence self-reported

frequency of maximal effort in Study 2. In the final study, normative information surrounding others behaviour (the descriptive norm) influenced individuals' level of moderate and vigorous physical activity during a particularly challenging time period (i.e., university final exams). Further, effects were demonstrated for three different populations (sport camp participants, recreational athletes, undergraduate students) highlighting the generalizability that descriptive norms have in activity settings.

In line with focus theory (Cialdini et al., 1990), results from Study 2 would suggest that individuals are motivated to act in norm-consistent ways when provided with information as to what others were doing. As descriptive norms are thought to motivate behaviour by providing cues as to what is appropriate behaviour in a situation, it seems as if the perception of how hard others are working in sport influenced a participant's estimation surrounding how hard she/he worked under certain competition situations. This finding adds to previous literature whereby normative messages influenced behaviour in relation to other physical activity tasks (Priebe & Spink, 2012, 2014) to an adult recreational sport setting.

5.1.2 Injunctive Norms and Activity

Another contribution of the current results was the examination of injunctive norms, which have received little attention in activity settings. In line with focus theory (Cialdini et al., 1990), results from Study 2 revealed that an injunctive norm message resulted in greater estimations of how often a person might exert effort in certain conditions compared to non-normative motivational messages. According to the tenets of the theory, injunctive norms work to influence behaviour by way of social sanctions associated with nonconformity (Cialdini et al., 1990). As previous research has established that social sanctions are typically associated with not putting forth effort in sport (Munroe et al., 1999), the current finding suggests that messages emphasizing others approval of those who work hard influenced the frequency of maximal effort reported by players. In other

words, injunctive norm messages predicted an estimation of greater frequency of reported maximal effort, which was consistent with the prediction of focus theory.

5.1.3 Normative Messaging in Activity

The current studies further highlight the use of normative messaging in the activity setting. The results of Studies 2 and 3 found that exposure to certain normative messages were related to specific individual outcomes compared to other messages. In particular, normative messages (both descriptive and injunctive) were related to perceived frequency of maximal effort in Study 2, whereas a message highlighting a high descriptive norm along with a high positive outcome expectation influenced behaviour in challenging circumstances in the third study. This supports and extends findings from other activity research (Priebe & Spink, 2012, 2014).

5.2 Contribution to Norm Literature and Theory

5.2.1 Descriptive Norms

One novel contribution to the norm literature is the finding that norm perceptions were positively associated with an individual outcome that was not directly related to the norm. As norms are typically concerned with specific behaviours (e.g., Cialdini et al., 1990), research in activity has focused on norms surrounding one behaviour and its relationship to an individual's engagement in that same behaviour (Priebe & Spink, 2011, 2012, 2014; Spink et al., 2013). However, as the results of Study 1 revealed, norm perceptions of one behaviour (i.e., prosocial behaviour) also was related to a different outcome (i.e., intention to return). As the tenets of the theory propose that norms motivate individuals to behave by providing information as to what is appropriate behaviour in a certain situation (Cialdini et al., 1990), the findings from Study 1 add to the literature by providing preliminary evidence that descriptive norms about one behaviour also may relate to an individual's estimations (cognitions) of a future goal-related outcome (i.e., intention to return).

5.2.2 Differentiating Descriptive and Injunctive Norms

One of the strengths of this research was the examination of both descriptive and injunctive norms, as highlighted in focus theory (Cialdini et al., 1990). The theory proposes that injunctive and descriptive norms motivate behaviour differently; therefore, important relationships may be missed if these norms are not examined separately. As a majority of previous work in the activity area had focused on descriptive norms (Priebe & Spink, 2011, 2012, 2014; Studies 1 and 3 of this dissertation), including a correlational study in a sport setting (Spink et al., 2013), the purpose of the second study was to examine the influence of descriptive *and* injunctive norms within sport. The results indicated that both types of norms were influential in impacting individual estimations of how frequently they gave maximal effort in different sport scenarios. Findings provide additional support for distinguishing between descriptive and injunctive norms within the specific activity setting of sport.

5.2.3 Norm Salience

Another way in which the studies extended past results was through the examination of a construct intended to heighten message salience. As suggested in focus theory (Cialdini et al., 1990), a norm is thought to influence behaviour only when the norm is made salient (focal) to the individual. Results of the third study indicated that when the behaviour was considered normative (i.e., many people engaged in exercise over the exam period), the message was more effective at influencing behaviour when it was ostensibly made focal through the strategic use of positive outcome expectations. As focus theory does not specify how to make a norm salient, results from the third study suggest that highlighting the benefits associated with activity may be one method that could be used when promoting physical activity using normative messages. In sum, the results add to the extant literature in activity by supporting the tenets of focus theory (Cialdini et al., 1990), whereby a normative message influenced behaviour when salient.

5.2.4 Use of Complementary Theories

As Study 3 considered the salience aspect of focus theory (Cialdini et al., 1990) by using positive outcome expectations stemming from social cognitive theory (Bandura, 1986), one of the strengths of this study was the complementary use of two theories. It was thought that providing participants with information about the benefits of exercising over the exams may lead individuals to greater engagement in the behaviour. As the positive outcome expectation interacted with the normative information, it was effective to use aspects of both focus theory and social cognitive theory to impact future behaviour.

5.3 Limitations and Future Directions

5.3.1 Descriptive Norms

Focus theory (Cialdini et al., 1990) highlights that descriptive norm information offers an information processing advantage. In this way, a perception of others' behaviour acts as a decisional shortcut when one is trying to choose how to behave in a situation. However, in this thesis, participants were not provided with a choice (i.e., yes/no) for any of the outcomes examined. Rather, participants were reflecting on their perceptions of different degrees of the particular outcome examined. In Study 1, participants were expressing a probability of returning to a group in the future, whereas in Study 2 participants reported on their self-reported frequency of maximal effort. Participants in the final study reported the amount of daily exercise they engaged in over the exam period. Therefore, results should be interpreted to suggest that descriptive norms were related to a relative degree of the outcome, not to a yes/no decision. While the outcomes do not completely align with the idea of making a decision, examining different degrees of an outcome is consistent with previous activity literature that has examined descriptive norms and its relationship with different physical activity outcomes (Priebe, 2013; Priebe & Spink, 2011, 2012, 2014; Spink et al., 2013). Future physical activity research may wish to test the assumption that descriptive norms influence an individuals' *choice* when deciding how to behave in a situation.

In relation to Study 1, another limitation surrounds how descriptive norms were measured. Participants were asked about their perceptions of *how many* of their group members exhibited prosocial behaviours. Given this assessment, it is unclear whether participants actually perceived the proportion of their group members as normative. As the average proportion of individuals perceived as engaging in prosocial behaviours was just over half, future researchers could assess whether participants perceived this amount of prosocial behaviours as normative.

5.3.1 Methodological Improvements

One limitation of the present set of studies pertains to the self-reported nature of the measures used in all three studies. As the outcome in each study asked participants to provide perceptions of their own behaviour, results should be interpreted as such, and not as an individual's *actual* behaviour. In order to minimize method variance associated with these studies (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), other measures could be utilized in the future to examine individual frequency of effort (e.g., teammate or coach ratings), as well as to examine moderate and vigorous physical activity levels (e.g., accelerometers).

In addition, some of the measures were modified, or developed specifically for the studies in this dissertation. Although the measures utilized were assumed to capture content validity, future researchers might wish to use content validation (e.g., using expert judges) to verify that the items used represented the construct being examined (Kerlinger, 1986).

Another methodological limitation relates to the lack of control conditions in the two experimental studies (Studies 2 and 3). Participant recruitment is often a factor in field experimental studies, and therefore decisions were made regarding the most effective number of conditions to test the research questions posed. Due to lower than expected initial recruitment numbers, along with projected drop-out levels that are often seen in field experiments, it was decided to forego the control group in order to have enough power to test the hypotheses of each study. In addition to logistical

considerations, the decision to not include control groups was made as previous research has demonstrated that normative messages impact individual activity behaviour when compared to a no-message control group (Priebe & Spink, 2012, 2014). However, without a no-message control group, differences can only be interpreted between the manipulated groups. Future research also should incorporate attention control conditions to provide more confidence in the results that the outcomes were influenced by the normative messages as opposed to any message.

5.3.2 Descriptive Norms and Outcome Expectations

As salience was not directly examined in the third study, it is still speculative as to whether outcome expectations heightened the salience of the normative information. In this study, the combined influence of norms and positive outcome expectations appeared to slow the decline of physical activity during university exams. As such, future researchers should assess whether providing information surrounding the benefits of a specific behaviour was effective at increasing the salience of the normative message. As the results of Study 3 indicate an interaction between descriptive norms and positive outcome expectations, it was reasoned that emphasizing the academic performance benefits of exercising focused the participants on the normative information (i.e., making the norm more salient). However, more research is required to explore this possibility by assessing different normative messages, and what makes them salient to individuals.

5.4 Conclusion

Social influence is a pervasive part of peoples' lives, and the combined results of these studies suggest that individuals in different settings are influenced by their perceptions of others (i.e., norms). While norm research has been well documented in other domains (Cialdini et al., 1990), only recently has it been examined in physical activity (Priebe & Spink, 2011, 2012, 2014) and sport (Spink et al., 2013) settings. This dissertation provides additional evidence for the potential

influence of norms on activity, cognitions, and behaviour in both sport and exercise, and suggests that:

1. Descriptive norms surrounding one behaviour (i.e., prosocial) may relate to an individual's perceptions of a different outcome (i.e., intent to return),
2. Messages surrounding an individual's perceptions of others' (both descriptive and injunctive) can positively influence self-reported estimates of frequency of effort in an organized sport setting, and,
3. Providing messages highlighting the positive academic performance benefits of exercise (i.e., high positive outcome expectations) may slow the decline of individuals' regular activity during an examination period, when coupled with normative information that many others are continuing to be active during that same period.

Researchers should continue to assess the effects of norms on activity in different contexts.

REFERENCES

Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp.11-39). Heidelberg: Springer.

Asch, S. E. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Balfour, D. L., & Wechsler, B. (1996). Organizational commitment. *Public Productivity & Management Review, 19,* 256-277.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191–215.

Bandura, A. (1986). *Social foundations of thought and action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology & Health, 13,* 623-649.

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior, 31,* 143-164. doi:10.1177/1090198104263660

Barcikowski, R.S. (1981). Statistical power with group mean as the unit of analysis. *Journal of Educational Statistics, 6,* 267-285.

Baron, R.A., & Byrne, D. (1981). *Social psychology: Understanding human interaction* (3rd ed.). Boston, MA: Allyn & Bacon.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 17,* 497-529.

Berkowitz, A. D. (2004). *The social norms approach: Theory, research, and annotated bibliography.* Trumansburg, NY: Independent Consultant. Retrieved from www.alanberkowitz.com.

Berkowitz, L. (1972). Social norms, feelings, and other factors affecting helping and altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (6th ed.). (pp. 63-108). San Diego, CA: Academic Press.

Berkowitz, L., & Daniels, L. R. (1964). Affecting the salience of the social responsibility norm. *Journal of Abnormal and Social Psychology, 68,* 275–281.

Bickman, L. (1972). Environmental attitudes and actions. *The Journal of Social Psychology, 87,* 323-324. doi:10.1080/00224545.1972.992533

Blanton, H., & Christie, C. (2003). Deviance regulation: A theory of action and identity. *Review of General Psychology, 7,* 115–149. doi:10.1037/1089-2680.7.2.115

Blanton, H., Stuart, A. E., & VandenEijnden, R. J. J. M. (2001). An introduction to deviance-regulation theory: The effect of behavioral norms on message framing. *Personality and Social Psychology Bulletin, 27,* 848-858. doi:10.1177/01467201277007

Blanton, H., VandenEijnden, R. J. J. M., Buunk, B. P., Gibbons, F. X., Gerrard, M., & Bakker, A. (2001). Accentuate the negative: Social images in the prediction and promotion of condom use. *Journal of Applied Social Psychology*, *31*, 274–295.

Bliese, P. D., Halverson, R. R., & Schriesheim, C. A. (2002). Benchmarking multilevel methods in leadership: The articles, the model, and the data set. *The Leadership Quarterly, 13,* 3-14.

Boardley, I. D., & Kavussanu, M. (2009). The influence of social variables and moral disengagement on prosocial and antisocial behaviours in field hockey and netball. *Journal of Sports Sciences, 27,* 843-854. doi:10.1080/02640410902887283

Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol and Drugs, 64,* 331-341.

Brisswalter, J., Collardeau, M., & René, A. (2002). Effects of acute physical exercise characteristics on cognitive performance. *Sports Medicine, 32,* 55-566. doi:10.2165/00007256-200232090-00002

Cameron, C., Wolfe, R., & Craig, C. L. (2007). *Physical activity and sport: Encouraging children to be active.* Ottawa, ON: Canadian Fitness and Lifestyles Research Institute.

Campbell, D. T., & Kenny, D. A. (1999). *A primer of regression artifacts.* New York, NY: Guilford Press.

Cartwright, D. (1951). Achieving change in people: Some applications of group dynamics theory. *Human Relations, 4,* 381-392. doi:10.1177/001872675100400404

Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science, 12,* 105-109. doi:10.1111/1467-8721.01242

Cialdini, R. B., Kallgren, C. A, & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and re-evaluation of the role of norms in human behaviour. *Advances in Experimental Social Psychology*, *24*, 201–234.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology, 58,* 1015–1026.

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed.). (pp. 151-192). New York, NY: McGraw-Hill.

Cialdini, R. B., Winter, P. L., Sagarin, B. J., Demaine, L. J., Barrett, D. W., & Rhoads, K. (2006). Managing social norms for persuasive impact. *Social Influence, 1*, 3–15. doi:10.1080/15534510500181459

Clarke, P. (2008). When can group level clustering be ignored? Multilevel models versus single-level models with sparse data. *Journal of Epidemiology and Community Health, 62,* 752-761. doi:10.1177/0018726751004004O4

Coakley, J., & White, A. (1992). Making decisions: Gender and sport participation among British adolescents. *Sociology of Sport Journal, 9,* 20-35.

Cohen, J. (1969). *Statistical power analysis for the behavioral sciences.* New York, NY: Academic Press.

Colley, R. C., Garriguet, D., Janssen, I., Craig, C. L., Clarke, J., & Tremblay, M. S. (2014). Physical activity of Canadian adults: Accelerometer results from the 2007 and 2009 Canadian Health Measures Survey. *Statistics Canada: Health Reports, 22,* 1-8.

deGroot, J. I. M., Abrahamse, W., & Jones, K. (2013). Persuasive normative messages: The influence of injunctive and personal norms on using free plastic bags. *Sustainability, 5,* 1829-1844. doi:10.3390/su5051829

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influence upon individual judgment. *Journal of Abnormal and Social Psychology, 51,* 629-698.

Dieterich, S. E., Stanley, L. R., Swaim, R., & Beauvais, F. (2013). Outcome expectancies, descriptive norms, and alcohol use: American Indian and white adolescents. *The Journal of Primary Prevention, 34,* 209-219. doi:10.1007/s10935-013-0311-6

Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology: Social, emotional, and personality development* (3rd ed.). (pp. 701-778). New York, NY: Wiley.

Eisler, L., & Spink, K.S., (1998). Effects of scoring configuration and task cohesion on the perception of psychological momentum. *Journal of Sport & Exercise Psychology, 20,* 311-320.

Etnier, J. L., Salazar, W., Landers, D. M., Petruzzello, S. J., Han, M., & Nowell, P. (1997). The influence of physical fitness and exercise upon cognitive functioning: A meta-analysis. *Journal of Sport & Exercise Psychology, 19,* 249-277.

Evans, M. B., Cooke, L. M., Murray, R. A., & Wilson, A. E. (2014). The sooner, the better: Exercise outcome proximity and intrinsic motivation. *Applied Psychology: Health and well-being.* doi:10.1111/aphw.12032

Evans, M. B., Eys, M. A., & Bruner, M. W. (2013). Seeing the "we" in "me" sports: The need to consider individual sport team environments. *Canadian Psychology, 53,* 301-308.

Fraser, S. N., & Spink, K. S. (2002). Examining the role of social support and group cohesion in exercise compliance. *Journal of Behavioral Medicine, 25,* 233-249.

Giacobbi, R. P., Jr., Roper, E., Whitney, J., & Butryn, T. (2002). College coaches' views about the development of successful athletes: A descriptive exploratory investigation. *Journal of Sport Behavior, 25,* 164-180.

Goldstein, N. J., & Cialdini, R. B. (2007). Using social norms as a lever of social influence. In A. R. Pratkanis (Ed.). *The science of social influence* (pp. 167-191). New York, NY: Taylor & Francis.

Grube, J. W., Morgan, M., & McGree, S. T. (1986). Attitudes and normative beliefs as predictors of smoking intentions and behaviors: A test of three models. *British Journal of Social Psychology, 25,* 81-93.

Gyurcsik, N. C., Spink, K.S., Bray, S. R., Chad, K., & Kwan, M. (2006). An ecologically based examination of barriers to physical activity in students from grade seven through first-year university. *Journal of Adolescent Health, 38,* 704-711. doi:10.1016/j.jadohealth.2005.06.007

Harkins, S. G., & Petty, R. E. (1981). The multiple source effect in persuasion: The effects of distraction. *Personality and Social Psychology Bulletin, 7,* 627-635.

Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). Be smart, exercise your heart: Exercise effects on brain and cognition. *Nature Review Neuroscience, 9,* 58-65. doi:10.1038/nrn2298

Hogg, M. A., & Terry, D. J. (2000). Social identity and self-categorization processes in organizational contexts. *The Academy of Management Review, 25,* 121-140.

Howe, J. (2012, October 5). For Brady and Manning hard work leads to success. *New Hampshire Union Leader.* Retrieved from http://www.unionleader.com.

Jung, M. E., & Brawley, L. R. (2010). Concurrent management of exercise with other valued life goals: Comparison of frequent and less frequent exercisers. *Psychology of Sport & Exercise, 11,* 872-877. doi:10.1016/j.psychsport.2010.04.006

Jung, M. E., & Brawley, L. R. (2011). Exercise persistence in the face of varying exercise challenges: A test of self-efficacy theory in working mothers. *Journal of Health Psychology, 16,* 728-738. doi:10.1177/1359105310388322

Jung, M. E., & Brawley, L. R. (2013). Concurrent self-regulatory efficacy as a mediator of the goal: Exercise behaviour relationship. *Journal of Health Psychology, 18,* 601-611. doi:10.1177/1359105313479238

Kashy, D. A., & Kenny, D. A. (2000). The analysis of data from dyads and groups. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 451-477). New York, NY: Cambridge University Press.

Kavussanu, M. (2008). Moral behaviour in sport: A critical review of the literature. *International Review of Sport and Exercise Psychology, 1,* 124-138. doi:10.1080/17509840802277417

Kavussanu, M., & Boardley, I. D. (2009). The Prosocial and Antisocial Behavior in Sport Scale. *Journal of Sport & Exercise Psychology, 31,* 97–117.

Kerlinger, F.N. (1986). *Foundations of behavioral research* (3rd ed.). New York, NY: Holt, Rinehart and Winston, Inc.

Kreft, I. G. G., de Leeuw, J., & Aiken, L. S. (1995). The effect of different forms of centering in hierarchical linear models. *Multivariate Behavioral Research, 30,* 1-21.

Kriska, A. M., Knowler, W. C., LaPorte, R. E., Drash, A. L., Wing, R. R., Blair, S. N., … Kuller, L. H. (1990). Development of questionnaire to examine relationship of physical activity and diabetes in Pima Indians. *Diabetes Care, 13,* 401-411. doi:10.2337/diacare.13.4.401

Kusch, J. (2002). *Test of a social norms approach to understanding disordered eating practices in college women.* Unpublished dissertation, Department of Psychology, Washington State University, Pullman, WA.

Lapinski, M. K., & Rimal, R. N. (2005). An explication of social norms. *Communication Theory, 15,* 127-147.

Latané, B. (1981). The psychology of social impact. *American Psychologist, 36,* 343-356.

Latané, B., & Darley, J. M. (1968). Group inhibition of bystander intervention in emergencies. *Journal of Personality and Social Psychology, 10,* 215-221.

Larimer, M. E., Neighbors, C., Labrie, J. W., Atkins, D. C., Lewis, M. A., Lee, C. M., … Walter, T. (2011). Descriptive drinking norms: For whom does reference group matter? *Journal of Studies on Alcohol and Drugs, 72*(5), 833–843.

Lenk, H. (1969). Top performance despite internal conflict: An antithesis to a functionalistic proposition. In J. W. Loy and G. S. Kenyon (Eds.), *Sport, culture, and society: A reader on the sociology of sport* (pp. 393-397). New York, NY: Macmillan Publishing.

Li, K. K. (2013). Domain dimensionality and temporality of outcome expectancy for physical activity among middle-aged and older Chinese adults: A latent profile analysis. *Psychology of Sport & Exercise, 14,* 682-691. doi:10.1016/j.psychsport.2013.05.007

McKee, H. C., & Ntoumanis, N. (2014). Multiple-goal management: Am examination of simultaneous pursuit of a weight-loss goal with another goal. *Journal of Health Psychology, 9,* 1163-1173.

Milgram, S. (1974). *Obedience to authority.* New York, NY: Harper & Row.

Milgram, S., Bickman, L., & Berkowitz, L. (1969). Note on the drawing power of crowds of different sizes. *Journal of Personality and Social Psychology, 13,* 79-82. doi:10.1037/h0028070

Mollen, S., Rimal, R. N., Ruiter, R. A. C., Jang, S. A., & Kok, G. (2013). Intervening or interfering? The influence of injunctive and descriptive norms on intervention behaviours in alcohol consumption contexts. *Psychology & Health, 28,* 561-578. doi:10.1080/08870446.2012.752827

Moreland, R. L., & Levine, J. M. (1982). Socialization in small groups: Temporal changes in individual-group relations. *Advances in Experimental Social Psychology, 15,* 137-192.

Munroe, K., Estabrooks, P., Dennis, P., & Carron, A. (1999). A phenomenological analysis of group norms in sport teams. *The Sport Psychologist, 13,* 171-182.

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin, 34,* 913–923. doi:10.1177/0146167208316691

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Okun, M. A., Fairholme, C., Karoly, P., Ruehlman, L. S., & Newton, C. (2006). Academic goals, goal process cognition, and exam performance among college students. *Learning and Individual Differences, 16,* 255-265. doi:10.1016/j.lindif.2006.04.001

Okun, M. A., Karoly, P., & Lutz, R. (2002). Clarifying the contribution of subjective norm to predicting leisure-time exercise. *American Journal of Health Behavior, 26,* 296-305.

Okun, M. A., Ruehlman, L., Karoly, P., Lutz, R., Fairholme, C., & Schaub, R. (2003). Social support and social norms: Do both contribute to predicting leisure-time exercise? *American Journal of Health Behavior, 27,* 493-507.

Patterson, M. M., Carron, A. V., & Loughead, T. M. (2005). The influence of team norms on the cohesion-self-reported performance relationship: A multi-level analysis. *Psychology of Sport & Exercise, 6,* 479-493. doi:10.1016/j.psychsport/2004/04/004

Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *The International Journal of the Addictions, 21,* 961-976.

Perkins, H. W., Meilman, P. W., Leichliter, J. S., Cashin, M. A., & Presley, C. A. (1999). Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health, 47,* 253-258.

Podsakoff, P. M., MacKenzie, S. B., Lee, J-Y., & Podsakoff, N. P. (2009). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88,* 879-903. doi:10.1037/0021-9010.88.5.879

Polonec, L. D., Major, A. M., & Atwood, L. E. (2006). Evaluating the believability and effectiveness of the social norms message "most students drink 0 to 4 drinks when they party". *Health Communication, 20,* 23–34.

Prapavessis, H., & Carron, A. V. (1997). Sacrifice, cohesion, and conformity to norms in sport teams. *Group Dynamics: Theory, Research, and Practice, 1,* 231-240.

Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology, 64,* 243-256.

Priebe, C. S. (2013). *Normative influence and physical activity*. Unpublished doctoral dissertation, College of Kinesiology, University of Saskatchewan, Saskatoon, SK, Canada.

Priebe, C. S., & Spink, K. S. (2011). When in Rome: Descriptive norms and physical activity. *Psychology of Sport and Exercise, 12,* 93–98. doi:10.1016/j.psychsport.2010.09.001

Priebe, C. S., & Spink, K. S. (2012). Using messages promoting descriptive norms to increase physical activity. *Health Communication, 27,* 284–291. doi:10.1080/10410236.2011.585448

Priebe, C. S., & Spink, K. S. (2014). Blood, sweat, and the influence of others: The effect of descriptive norms on muscular endurance and task self-efficacy. *Psychology of Sport & Exercise, 15,* 491-497. doi:10.1016/j.psychsport.2014.04.012.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Application and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., Congdon, R. T., & du Toit, M. (2011). *HLM 7: Hierarchical linear and nonlinear modeling.* Chicago, IL: Scientific Software International.

Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology, 64,* 104-112.

Rhodes, R. E., & de Bruijn, G-J. (2013). How big is the physical activity intention-behaviour gap? A meta-analysis using the action control framework. *British Journal of Health Psychology, 18,* 296-309. doi:10.1111/bjhp.12032

Rimal, R. N. (2008). Modeling the relationship between descriptive norms and behaviors: A test and extension of the theory of normative social behaviour (TNSB). *Health Communication, 23,* 103-116. doi:10.1080é10410230801967791

Robinson, E., Fleming, A., & Higgs, S. (2014). Prompting healthier eating: Testing the use of health and social norm based messages. *Health Psychology, 33,* 1057-1064. doi:10.1037/a0034213

Rubin, M., & Hewstone, M. (1998). Social identity theory's self-esteem hypothesis: A review and some suggestions for clarification. *Personality and Social Psychology Review, 2,* 40-62.

Sage, L. D., & Kavussanu, M. (2008). Goal orientations, motivational climate, and prosocial and antisocial behaviour in youth football: Exploring their temporal stability and reciprocal relationships. *Journal of Sports Sciences, 26,* 717-732. doi:10.1080/02640410701769716

Scholly, K., Katz, A. R., Gascoigne, J., & Holck, P. S. (2005). Using social norms theory to explain perceptions and sexual health behaviors of undergraduate college students: An exploratory study. *Journal of American College Health, 53,* 159-166.

Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology, 21,* 25-36.

Schutz, W.C. (1966). *The interpersonal underworld*. Palo Alto, CA: Science & Behavior Books.

Seefeldt, V., Malina, R. M., & Clark, M. A. (2002). Factors affecting levels of physical activity in adults. *Sports Medicine, 32,* 143-168.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston, MA: Houghton Mifflin.

Shaw, M. E. (1981). *Group dynamics: The psychology of small group behavior* (3rd ed.). New York, NY: McGraw-Hill.

Sheeran, P. (2002). Intention-behavior relations: A conceptual and empirical review. *European Review of Social Psychology, 12,* 1-36. doi:10.1080/14792772143000003

Sherif, M. (1937). An experimental approach to the study of attitudes. *Sociometry, 1,* 90-98.

Shields, D. L., Bredemeier, B. L., LaVoi, N. M., & Power, F. C. (2005). The sport behavior of youth, parents, and coaches: The good, the bad, and the ugly. *Journal of Research in Character Education, 3,* 43-59.

Shonk, D. J., & Chelladurai, P. (2008). Service quality, satisfaction, and intent to return in event sport tourism. *Journal of Sport Management, 22,* 587-602.

Shumaker, S. A., & Brownell, A. (1984). Toward a theory of social support: Closing conceptual gaps. *Journal of Social Issues, 40,* 11-36.

Spink, K. S. (1995). Cohesion and intention to participate of female sport team athletes. *Journal of Sport & Exercise Psychology, 17,* 416-427.

Spink, K. S., Crozier, A. J., & Robinson, B. (2013). Examining the relationship between descriptive norms and perceived effort in adolescent athletes: Effects of different reference groups. *Psychology of Sport and Exercise, 14,* 813–818. doi:10.1016/j.psychsport.2013.06.006

Spink, K. S., Nickel, D., Wilson, K., & Odnokon, P. (2005). Using a multilevel approach to examine the relationship between task cohesion and team task satisfaction in elite ice hockey players. *Small Group Research, 36,* 539-554. doi:10.1177/1046496405275229

Stok, F. M., de Ridder, D. T. D., de Vet, E., & de Wit, J. B. F. (2012). Minority talks: The influence of descriptive social norms on fruit intake. *Psychology & Health, 27,* 956–970.

Strachan, S.M., Flora, P.K., Brawley, L.R., & Spink, K.S. (2011).Varying the cause of a challenge to exercise-identity behavior: Reactions of individuals of differing identity strength. *Journal of Health Psychology, 16,* 572-583.

Tabachnick, B. G., & Fidell, L. S. (2011). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.

Tajfel, H. (1979). Individuals and groups in social psychology. *British Journal of Social and Clinical Psychology, 18,* 183-190.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.). *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole.

Terry, D. J., & Hogg, M. A. (1996). Group norms and attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin, 22,* 776-793.

Terry, D. J., & Hogg, M. A. (2001). Attitudes, behavior, and social context: The role of norms and group membership in social influence processes. In J. P. Forgas & K. D. Williams (Eds.), *Social influence: Direct and indirect processes. The Sydney symposium of social psychology.* (pp. 253-270). Philadelphia, PA: Psychology Press.

Tomporowski, P. D. (2003). Effects of acute bouts of exercise on cognition. *Acta Psychologica, 112,* 297-324. doi:10.1016/S0001-6918(02)00134-8

Toronto's Litter Prevention Program. (2002). *The litter prevention program.* Retrieved from http://www.litterpreventionprogram.com.

Tremblay, M. S., Warburton, D. E. R., Janssen, I., Paterson, D. H., Latimer, A. E., Rhodes, R. E., … Duggan, M. (2011). New Canadian physical activity guidelines. *Applied Physiology, Nutrition, and Metabolism, 36,* 36-46. doi:10.1139/H11-009

Trockel, M. T., Barnes, M. D., & Egget, D. L. (2000). Health-related variables and academic performance among first-year college students: Implications for sleep and other behaviours. *Journal of American College Health, 49,* 125-131. doi:10.1080/07448480009596294

Trudeau, F., & Shepard, R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International Journal of Behavioral Nutrition and Physical Activity, 5:*10. doi:10.1186/1479-5868-5-10

Turner, J. C. (1991). *Social influence.* Bristol, PA: Open University Press.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory.* New York, NY: Blackwell.

Ullrich-French, S., & Smith, A. L. (2009). Social and motivational predictors of continued youth sport participation. *Psychology of Sport & Exercise, 10,* 87-95. doi:10.1016/j.pschsport.2008.06.007.

Vazou, S., Ntoumanis, N., & Duda, J. L. (2005). Predicting young athletes' motivational indices as a function of their perceptions of the coach- and peer-created climate. *Psychology of Sport & Exercise, 7,* 215-233. doi:10.1016/j.psychsport.2004.03.005

Vincent, W. J., & Weir, J. P. (2012). *Statistics in Kinesiology* (4th ed.). Champaign, IL: Human Kinetics.

Vuillemin, A., Oppert, J-M., Guillemin, F., Essermeant, L., Fontvielle, A-M., Galan, P., Kriska, A. M., & Hercberg, S. (2000). Self-administered questionnaire compared with interview to assess past-year physical activity. *Medicine & Science in Sports & Exercise, 32,* 1119-1124.

Warburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174,* 801-809. doi:10.1503/cmaj.051351.

Weidner, G., Kohlmann, C-W., Dotzauer, E., & Burns, L. R. (1996). The effects of academic stress on health behaviors in young adults. *Anxiety, Stress & Coping: An International Journal, 9,* 123-133. doi:10.1080/10615809608249396.

Weinstein, N. D. (2007). Misleading tests of health behavior theories. *Annals of Behavioral Medicine, 33,* 1-10.

Weiss, M. R., Smith, A. L., & Stuntz, C. P. (2008). Moral development in sport and physical activity: Theory, research, and intervention. In T. S. Horn (Ed.), *Advances in sport psychology* (3rd ed.) (pp. 187-210). Champaign, IL: Human Kinetics.

Widmeyer, W. N., & Ducharme, K. (1997). Team building through team goal setting. *Journal of Applied Sport Psychology, 9,* 97-113. doi:10.1080/10413209708415386.

Zander, A. (1976). The psychology of removing group members and recruiting new ones. *Human Relations, 29,* 969-987.

Appendix A – Study 1 Parent Letter

Dear Parent/Guardian(s):

My name is Alyson Crozier. I am a PhD student in the College of Kinesiology, and with my supervisor, I will be conducting a study examining the effect of group factors (e.g., social norms, groupness) on a number of individual behaviours (e.g., effort levels, pro-social behaviours) that occur within sport camp settings. The results of this study will benefit the Huskie Sports camp organization, and its instructors, by providing information about how aspects of the camp environment are related to players' effort at camp and how to encourage athlete's in engaging in pro-social behaviours.

If your son/daughter volunteers to participate in this study, he/she will be asked to answer some questions at one-time point during the week-long sports camp. This session will be arranged in advance through the camp instructor. Questions will have taken approximately 5 minutes to complete.

Participation in this study is completely voluntary and presents no anticipated risks. No deception will be used in this study. If your son/daughter volunteers, he/she may choose not to respond to any survey questions that they do not feel comfortable answering. A decision to participate or not to participate in the study will have no impact on how your child is treated within the sports camp. As well, you and your child can withdraw his/her data from the study up until December 31, 2013. After these dates, it is likely that the results will have been disseminated, and data withdrawal may not be possible.

Results will be presented in aggregate form so that individual participants' identities are not known. Any information that your son/daughter provides on the surveys will be kept confidential by the researchers. Survey data will be stored by Dr. Kevin Spink in a locked office at the University of Saskatchewan for a minimum of five years after the completion of the study. If you or your son/daughter wishes, you may withdraw from the study at any time up until December 31, 2013, for any reason, without penalty, or without causing anyone to be upset.
If you, or your son/daughter, have any questions or concerns about this study, please do not hesitate to contact Alyson Crozier (306-241-8677) or Dr. Kevin Spink (306-966-1074) at any time.

Thank you.

Sincerely,

Alyson Crozier
Ph.D. Candidate
College of Kinesiology
University of Saskatchewan
Phone: 306-241-8677
Fax: 306-966-6464
Email: alyson.crozier@usask.ca

Dr. Kevin Spink
Professor
College of Kinesiology
University of Saskatchewan
Phone: 306-966-1074
Fax: 306-966-6464
Email: kevin.spink@usask.ca

Appendix B – Study 1 Participant Consent Form

We are doing a study to try to learn about various aspects of the camp environment. We will ask questions about your involvement with others in the camp, as well as what you think about the camp setting. We are asking for your help because we don't know a lot about what kids think about being involved in summer camps.

The study is being done by Dr. Kevin S. Spink, who is a Professor, in the College of Kinesiology, at the University of Saskatchewan (966-1074, Email: kevin.spink@usask.ca) and Alyson Crozier, who is a graduate student in the College (966-1099, Email: alyson.crozier@usask.ca).

If you agree to be in this study, you will be given a short questionnaire that asks you about your camp experience. It should take no more than 5 minutes to answer the questions. We also will ask your camp instructor about how all the kids did during the week-long sports camp.

We do not see any risks to you if you join the study. Also, being in this study will not help you directly, but in the future it might help the Huskie Sports camp organization and sport researchers better understand how people within a group environment can affect youth sport participation.

Only the researchers will know you are in the study. When the study is finished, the researchers will write a report about what was learned. This report will not say your name or say that you were in the study. You and your parents do not have to tell anyone that you were in the study if you don't want to. If you would like to know what we found, you can email kevin.spink@usask.ca to get a copy.

The data from the study will be kept in a safe place and only the resesearchers will be able to see it. The data will be kept for a minimum of five years after the study is published.

You can ask questions that you might have at any time about the study. This study also has been approved by the University of Saskatchewan Research Ethics Board. You or your parents can also call them if you have any questions (ethics.office@usask.ca or 306- 966-2975). If you live out of town, you can call toll-free (888-966-2975).

Also, if you decide at any time that you do not want to complete the study, you can stop whenever you want and this will not cause anyone to be upset or angry, it will not result in any type of penalty, and it will not have any effect on this or any future Huskie summer activity programs. Also, if there are any questions that you don't feel comfortable answering, you can leave them blank. If you decide to leave the study, your answers will be destroyed. However, you need to tell us before December 31, 2013. After that time, it may not be possible to destroy your data.

Signing this paper means you have read this and that you want to be in the study. Remember, being in the study is up to you, and no one will be mad if you don't sign this paper or even if you change your mind later.

_____	_____	_____
Name of Participant	*Signature*	*Date*

_____	_____
Researcher's Signature	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Please share the consent form with your parents.

Appendix C – Study 1 Survey
HUSKIE SPORT CAMP STUDY

Age: _____ **Gender (circle one):** Male / Female

For the following questions, think about the **MEMBERS OF THE SMALL GROUP** that you have worked with all week. Please circle a number from 1 to 5 based on your own perceptions.

1) How many members provided encouragement to other members?

1	2	3	4	5
NONE	SOME	HALF	MOST	ALL

2) How many members congratulated a fellow member for a good play?

1	2	3	4	5
NONE	SOME	HALF	MOST	ALL

3) How many members provided positive feedback to other members?

1	2	3	4	5
NONE	SOME	HALF	MOST	ALL

4) How many members tried to help another member on a difficult task?

1	2	3	4	5
NONE	SOME	HALF	MOST	ALL

The following questions are asking about your INTENTION TO RETURN to this group if there was the opportunity to.

5) If this camp started again next week, how likely would you be to want to return to <u>this small group</u> again?

1	2	3	4	5
NOT AT ALL LIKELY (at or near 0% chance)	NOT LIKELY (25% chance or less)	SO-SO (50% chance)	LIKELY (75% chance or better)	VERY LIKELY (at or near 100%)

6) If you had a choice to be in any small group at next years' camp, how likely are you to return to <u>this small group</u> again?

1	2	3	4	5
NOT AT ALL LIKELY (at or near 0% chance)	NOT LIKELY (25% chance or less)	SO-SO (50% chance)	LIKELY (75% chance or better)	VERY LIKELY (at or near 100%)

Appendix D – Study 2 Consent Form

You are invited to participate in a research study involving volleyball players playing in SAVA. Please read this form carefully and feel free ask any questions now. If you have any questions during the study, please feel free to contact the researchers via email c. phone using the information listed below.

Project Title: Group influences on athete effort.

Researchers:

Alyson J. Crozier
PhD Candidate
College of Kinesiology
University of Saskatchewan
Tel: (306) 966-1099
Email: alyson.crozier@usask.ca

Kevin Spink
Professor
College of Kinesiology
University of Saskatchewan
Tel: (306) 966-1074
Email: kevin.spink@usask.ca

Purpose: In this study, we are interested in examining your perceptions of effort on SAVA volleyball teams.

Procedure: Your participation will involve assessing your own effort behaviours at three time points, as well as some team behaviours at one of those time points. Each assessment will take approximately 10 minutes to complete. You also may be contacted via e-mail by the primary investigator after the initial data collection to receive some feedback about the first set of study results. If you choose to participate, confidentiality is assured, meaning that only the researchers will be able to link your identity to your responses.

Potential Benefits: All participants will be entered to win a $50 Gift Card from Tim Horton's. As a participant, you may be making important contributions to the research literature. There are no personal benefits to participating in this study, although the findings from this study will help sport researchers to better understand the relationship between group influences and player effort.

Potential Risks: Participation in this study presents no anticipated risks.

Storage of Data: Electronic data will be copied to an external drive and will be locked by password in read-only format. Only the researchers will have access to the data. No data will be stored on any computer hard drives once the study is complete. The data will be stored for a minimum of five years after completion of the study. If the researcher chooses to destroy the data after the five years, it will be destroyed beyond recovery. This is standard protocol for any data that may be published in an academic journal or presented at a professional conference.

Confidentiality: Steps will be taken to ensure confidentiality. Although you will be required to provide your name on the survey in order to match your responses, only the researchers will have access to this information. When published or presented at conferences, the data will be reported

in a summarized form so that it will not be possible to identify responses from individual participants.

Right to Withdraw: Your participation in this study is voluntary and you are free to answer only the questions that you are comfortable answering. You may withdraw from the research project for any reason, at any time, without penalty of any sort. If you withdraw from the study before completion, any data that you have contributed will be destroyed. Your right to withdraw data from this study will apply until December 31, 2013 for the first and second data collection periods, and until April 31, 2014 for the third data collection period. After these dates, it is likely that some study results will have already been disseminated, and it may not be possible to withdraw your data.

Questions: If you have any questions concerning the research project, please feel free to contact the researchers at any time using the phone number/email address provided above. This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office (ethics.office@usask.ca or 306- 966-2975). Out of town participants may call toll-free (888-966-2975).

Study Results: If you would like a summary of the findings from this study, please email the researchers (kevin.spink@usask.ca).

Consent to Participate:
Your signature below indicates that you have read and understand the description provided.

****

I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project. A copy of this Consent Form has been given to me for my record.

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Name of Participant	*Signature*	*Date*

Researcher's Signature	*Date*

Appendix E – Study 2 Initial Survey

Group influences on athlete effort

Name: _____ **Age:** _____ **Gender** (circle one): Male / Female

Email address:_____

Team Name: _____

Division (circle one)**:** Co-ed A / B / C / D - Women's A / B / C

The following questions ask about your experience in the **SAVA Volleyball league**

1) **Number of years playing in the SAVA league: _____**

2) **Number of years playing on this current team: _____**

The following statements ask about **YOUR PERCEPTIONS** of how often **YOU** do the following behaviours**.**

When playing volleyball in the SAVA league, I...

1) Give 100% effort when winning by a large margin

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

2) Give 100% effort when losing by a large margin

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

3) Give 100% effort when the opposing team has scored 5 or more consecutive points in a row

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

4) Do whatever it takes (diving, chasing the ball) to not let the ball hit the floor

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

Appendix F – Study 2 E-mail Messages

Descriptive Norm condition:

(1) Losing by Large Margin:

Join Other Players in Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How are players like you working hard? In a recent survey, players in your division provided the reasons they worked hard - 95% of the players on those teams reported giving 100% effort even when losing games by a large margin! - Give 100% effort even when losing by a lot - the common strategy of players on teams in your SAVA division.

(2) Winning by Large Margin

Join Other Players in Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How are players like you working hard? In a recent survey, players in your division provided the reasons they worked hard - 92% of the players on those teams reported giving 100% effort even when winning games by a large margin! – Give 100% effort even when winning by a lot – the common strategy of players on teams in your SAVA division.

(3) Momentum:

Join Other Players in Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How are players like you working hard? In a recent survey, players in your division provided the reasons they worked hard - 97% of the players on those teams reported giving 100% effort even when the opponents had scored 5 or more points in a row! – Give 100% effort even when the opponents have the momentum – the common strategy of players on teams in your SAVA division.

(4) Doing What it Takes:

Join Other Players in Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How are players like you working hard? In a recent survey, players in your division provided the reasons they worked hard - 94% of the players on those teams reported doing whatever it takes (diving, chasing the ball) to not let the volleyball hit the floor! – Give 100% effort by doing whatever it takes to keep the ball in play – the common strategy of players on teams in your SAVA division.

Injunctive Norm condition:

(1) Losing by Large Margin

Do the Right Thing by Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How should players like you be working hard? In a recent survey, players in your division provided the reasons they worked hard

- 95% of those surveyed believed that players should be willing to give 100% effort even when losing games by a large margin! – Give 100% effort even when losing by a lot – the strategy approved of by players on teams in your SAVA division.

(2) Winning by Large Margin

Do the Right Thing by Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How should players like you be working hard? In a recent survey, players in your division provided the reasons they worked hard - 92% of those surveyed believed that players should be willing to give 100% effort even when winning games by a large margin! – Give 100% effort even when winning by a lot – the strategy approved of by players on teams in your SAVA division.

(3) Momentum:

Do the Right Thing by Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How should players like you be working hard? In a recent survey, players in your division provided the reasons they worked hard - 97% of those surveyed believed that players should be willing to give 100% even when the opponents had scored 5 or more points in a row! – Give 100% effort even when the opponents have the momentum – the strategy approved of by players on teams in your SAVA division.

(4) Doing What it Takes:

Do the Right Thing by Working Hard. We're halfway through the season and most SAVA players are finding ways to work hard when on the court. How should players like you be working hard? In a recent survey, players in your division provided the reasons they worked hard - 94% of those surveyed believed that players should be willing to give 100% effort by doing whatever it takes (diving, chasing the ball) to not let the volleyball hit the floor! – Give 100% effort and do what it takes to keep the ball in play – the strategy approved of by players on teams in your SAVA division.

Personal Reasons Condition:

(1) Losing by Large Margin

Improve Your Skill by Working Harder. You're halfway through the season and the time is right for improving your skill by working hard while you are playing the game. How can you improve your skill? Research has shown that there are many ways to work hard while playing the game that will help you to improve your skill. One way is to give 100% effort even when your team is losing by a large margin. By working hard even when your team is losing by a big margin, you can improve your volleyball skill.

(2) Winning by Large Margin

Improve Your Skill by Working Harder. You're halfway through the season and the time is right for improving your skill by working hard while you are playing the game. How can you improve your skill? Research has shown that there are many ways to work hard while playing the game that will help you to improve your skill. One way is to give 100% effort even when your team is winning by a large margin. By working hard even when the game is in your team's favour, you can improve your volleyball skill.

(3) Momentum:

Improve Your Skill by Working Harder. You're halfway through the season and the time is right for improving your skill by working hard while you are playing the game. How can you improve your skill? Research has shown that there are many ways to work hard while playing the game that will help you to improve your skill. One way is to give 100% effort even when the opponent has scored 5 or more points in a row. By working hard even when the other team has the momentum, you can improve your volleyball skill.

(4) Doing What it Takes:

Improve Your Skill by Working Harder. You're halfway through the season and the time is right for improving your skill by working hard while you are playing the game. How can you improve your skill? Research has shown that there are many ways to work hard while playing the game that will help you to improve your skill. One way is to do whatever it takes (e.g., diving, chasing the ball) to not let the volleyball hit the floor. By working hard to keep the ball in play, you can improve your volleyball skill.

Team Reasons Condition:

(1) Losing by Large Margin

Help Your Team by Working Harder. You're halfway through the season and the time is right to help your team by working hard while you are playing the game. How can you help your team? Research has shown that there are many ways to work hard while playing the game that will help your team. One way is to give 100% effort even when your team is losing by a large margin. By working hard even when your team is losing by large margin, you can help your team do better.

(2) Winning by Large Margin

Help Your Team by Working Harder. You're halfway through the season and the time is right to help your team by working hard while you are playing the game. How can you help your team? Research has shown that there are many ways to work hard while playing the game that will help your team. One way is to give 100% effort even when your team is winning by a large margin. By working hard even when the game is in your team's favour, you can help your team do better.

(3) Momentum:

Help Your Team by Working Harder. You're halfway through the season and the time is right to help your team by working hard while you are playing the game. How can you help your team? Research has shown that there are many ways to work hard while playing the game that will help your team. One way is to give 100% effort even when the opponent has scored 5 or more points in a row. By working hard even when the opponent has the momentum, you can help your team do better.

(4) Doing What it Takes:

Help Your Team by Working Harder. You're halfway through the season and the time is right to help your team by working hard while you are playing the game. How can you help your team? Research has shown that there are many ways to work hard while playing the game that will help your team. One way is to do whatever it takes (e.g., diving, chasing the ball) to not let the volleyball hit the floor. By working hard to keep the ball in play, you can help your team do better.

Appendix G – Study 2 Final Survey
Group influences on athlete effort

Name: _____ **Team Name:**_____

The following statements ask about **YOUR PERCEPTIONS** of how often **YOU** do the following behaviours**.** Please circle a number from 1 to 9 to indicate how much you agree with each statement.

When playing volleyball in the SAVA league, I...

1) Give 100% effort when winning by a large margin

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

2) Give 100% effort when losing by a large margin

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

3) Give 100% effort when the opposing team has scored 5 or more consecutive points in a row

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

4) Do whatever it takes (diving, chasing the ball) to not let the ball hit the floor

1	2	3	4	5	6	7	8	9
Almost never								Almost all the time

Manipulation Check Questions

The below questions refer to information about others effort that were sent via e-mail over the past four weeks. Please answer the questions honestly.

5) Do you recall receiving and reading email messages in the past four weeks that contained information about reasons for working hard in SAVA?

Yes ___ No ___

6) Can you recall how many messages you received? _____

7) The information in the messages was *believable*.

1	2	3	4	5	6	7
STRONGLY DISAGREE						STRONGLY AGREE

8) The information in the messages was *persuasive*.

1	2	3	4	5	6	7
STRONGLY DISAGREE						STRONGLY AGREE

Appendix H – Study 2 Debriefing Letter

Kevin S. Spink, Ph.D.
College of Kinesiology, University of Saskatchewan
87 Campus Drive,
Physical Activity Complex
Phone: (306) 966-1074
Email: kevin.spink@usask.ca

Dear Participant:

Thank you for taking the time to participate in our study on effort in sport. It is important that we continue to examine the relationship between group influence and player effort. Your contribution to this research helps us explore how others' behaviour and thoughts may influence your own subsequent effort levels.

You were told that the purpose of the study was to examine effort within team sports. However, our specific purpose was to understand the influence of norm messages on individual effort behaviour. Specifically, we were interested in examining the effect of being told about others' effort (i.e., norms about the amount of effort reported by players on other teams) on individual effort behaviour. In order to examine this question, we needed to create different norms to examine how these different norms might influence your own behaviour. As we crafted the message you received, it is possible that the effort comparisons that you received about other players may have differed from the actual effort levels reported by those other players. As we mentioned previously, you are still able to withdraw your data at this point with absolutely no penalty.

If you are interested in learning more about the findings of this study, I will be pleased to provide a summary to you. To get this summary, please contact me at the address listed above and I will mail the summary to you. If you have any further questions about the study itself, please feel free to contact me as I would be happy to answer any of your questions.

Once again, thank you for making a valuable contribution to our research.

Sincerely,

Kevin S. Spink, Ph.D.
Professor

Appendix I – Study 3 Consent Form

You are invited to participate in a research study involving undergraduate students from the University of Saskatchewan. Please read this form carefully. If you have any questions now or during the study, please feel free to contact the researchers via email or phone using the information listed below. This study forms a portion of the student investigator's PhD thesis.

Project Title: Students Exercise Behaviour During the Examination Period

Researchers:

Alyson J. Crozier
PhD Candidate
College of Kinesiology
University of Saskatchewan
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Email: alyson.crozier@usask.ca

Kevin Spink
Professor
College of Kinesiology
University of Saskatchewan
Tel: (306) 966-1074
Email: kevin.spink@usask.ca

Purpose: In this study, we are interested in examining your exercise intentions and behaviour over the exam period.

Procedure: Your participation will involve assessing your own exercise intentions and behaviour at 3 time points, twice before the exam period and once after the exam period. You will be contacted via e-mail by the primary investigator after the initial data collection in order to receive the links to the second and third online surveys and possibly receive more information about exercise during an exam period. NO communication will occur during the exam period. Each assessment will take approximately 5 minutes to complete. If you choose to participate, confidentiality is assured, meaning that only the researchers will be able to link your identity to your responses.

Potential Benefits: All participants will be entered to win a $50 Gift Card from the University Bookstore once all portions of the study have been completed. As a participant, you may be making important contributions to the research literature. There are no personal benefits to participating in this study, although the findings from this study will help exercise researchers to better understand the exercise patterns of students over the exam period.

Potential Risks: Participation in this study presents no anticipated risks.

Storage of Data: Electronic data will be copied to an external drive and will be locked by password in read-only format. Only the researchers will have access to the data. No data will be stored on any computer hard drives once the study is complete. The data will be stored for a minimum of five years after completion of the study. If the researcher chooses to destroy the data after the five years, it will be destroyed beyond recovery. This is standard protocol for any data that may be published in an academic journal or presented at a professional conference.

Confidentiality: Steps will be taken to ensure confidentiality. Although you will be required to provide your name on the survey, a participant ID number will be provided to you for follow-up

surveys in order to match your responses from the three time points. Only the researchers will have access to the information linking your name to your participant ID. When published or presented at conferences, the data will be reported in a summarized form so that it will not be possible to identify responses from individual participants.

Right to Withdraw: Your participation in this study is voluntary and you are free to answer only the questions that you are comfortable answering. You may withdraw from the research project for any reason, at any time, without penalty of any sort. If you withdraw from the study before completion, any data that you have contributed will be destroyed. Your right to withdraw data from this study will apply until April 30th, 2014. After this date, it is likely that some study results will have already been disseminated, and it may not be possible to withdraw your data.

Questions: If you have any questions concerning the research project, please feel free to contact the researchers at any time using the phone numbers/email addresses provided above. This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office (ethics.office@usask.ca or 306- 966-2975). Out of town participants may call toll-free (888-966-2975).

Study Results: If you would like a summary of the findings from this study, please email the primary researcher (kevin.spink@usask.ca).

Consent to Participate:
Your signature below indicates that you have read and understand the description provided. At each of the follow-up assessments, submission of the surveys on the online website will imply your consent to participate.

****

I consent to participate in the research project. The chance to print a copy of this Consent Form has been provided to me for my records.

Name of Participant	*Signature*	*Date*

Researcher's Signature	*Date*

Please print this page if you would like to keep a copy for your records.

Appendix J – Study 3 Initial Survey
Exercise During the Exam Period

This study is for **full-time undergraduate students** who exercise regularly (≥ 150 minutes per week) BUT typically reduce their physical activity levels at some point over the exam period.

This questionnaire will take approximately 5-10 minutes to complete. Please read all the instructions and questions carefully.

First, we are going to ask you some questions about yourself. Please answer each question honestly. If you do not feel comfortable answering any of the questions, please move on to the next question.

1) **What is your age? _____**
2) **What is your gender?** Male/Female/Prefer not to disclose
3) **What is your program year in your undergraduate degree?** 1 / 2 / 3 / 4 / 5 / 6 / 7+
4) **What is your student status?**
    - Full-time (3 or more courses per term)
    - Part-time (1 or 2 courses per term)
5) **How many final exams do you have scheduled between December 6th-21st (this DOES NOT include finale exams that will happen during class time prior to December 6th)? _____**
6) **Which date is your last exam scheduled on? _____**
7) **Have you experienced a reduction in your physical activity at some point over a previous exam period?** Yes/No

Current Exercise Behaviour

We are now interested in your **typical** physical activity routine OVER THE PAST FOUR WEEKS, specifically how much moderate and vigorous physical activity you engage in most weeks.

******Please think of a typical week during the past 4 weeks******

1. Browse through the activities listed below and find all the activities that you did at a moderate (above normal breathing) or vigorous (heavy breathing) intensity during this typical week.

2. Put one of your activities under "Activity #1" below, and answer the 3 questions that follow that are related to that activity.

3. You will repeat this process until all of the activities you have engaged in have been accounted for (up to a total of 7 activities).

Aerobics	Badminton	Basketball	Boxing	Biking/Cycling
Bowling	Cardio machine	Dance (specify)	Figure skating	Gymnastics
Ice Hockey	Martial Arts	Racquetball	Ringette	Running/jogging

Running/Jogging	Skipping	Skiing-X country	Skiing-Downhill	Snowboarding
Soccer	Speed Skating	Street/Floor hockey	Swimming-synchro	Swimming-Laps
Tennis	Track & Field	Volleyball	Wrestling	Walking
Wall Climbing	Weight lifting	Yoga	Other	

Activity #1
Enter the first activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical physical activity week.

1a) Enter the number of times doing Activity #1 during this typical week. _____

1b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #1. **do not include time spent changing clothes, stretching, standing around, etc. _____**

1c) What was the average intensity at which you were active in Activity #1? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #2

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

2a) Enter the number of times doing Activity #2 during this typical week. _____

2b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #2. **do not include time spent changing clothes, stretching, standing around, etc. _____**

2c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #3

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

3a) Enter the number of times doing Activity #3 during this typical week. _____

3b) Record the average (not total) number of minutes you were *actually active* each time

when engaging in Activity #3. **do not include time spent changing clothes, stretching, standing around, etc. _____

3c) What was the average intensity at which you were active in Activity #3? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #4

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

4a) Enter the number of times doing Activity #4 during this typical week. _____

4b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #4. **do not include time spent changing clothes, stretching, standing around, etc. _____

4c) What was the average intensity at which you were active in Activity #4? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #5

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

5a) Enter the number of times doing Activity #5 during this typical week. _____

5b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #5. **do not include time spent changing clothes, stretching, standing around, etc. _____

5c) What was the average intensity at which you were active in Activity #5? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #6

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

6a) Enter the number of times doing Activity #6 during this typical week. _____

6b) Record the <u>average</u> (not total) number of <u>minutes</u> you were *actually active* <u>each time</u> when engaging in Activity #6. **do not include time spent changing clothes, stretching, standing around, etc. _____**

6c) What was the average intensity at which you were active in Activity #6? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

<u>Activity #7</u>

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

If not, enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity during this typical week.

7a) Enter the number of times doing Activity #2 during this typical week. _____

7b) Record the <u>average</u> (not total) number of <u>minutes</u> you were *actually active* <u>each time</u> when engaging in Activity #2. **do not include time spent changing clothes, stretching, standing around, etc. _____**

7c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

<u>Intentions</u>

The following questions ask you about your intentions to be active over the exam period in December 2013. Please answer how much you agree with the following statements while **considering your typical physical activity routine**, as listed above:

1) **I intend to maintain my current physical activity routine over the exam period.**

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

2) **I plan to keep up with my exercise routine over the exam period.**

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Thank you for completing part 1!

Thank you for taking the time to complete this survey. Please enter an e-mail address below **that you check often** so that the researchers can contact you for the next portion of the study. Please expect an e-mail approximately 2-3 days prior to the exam period beginning. You will NOT receive any communications during the actual exam period, so the surveys will not interfere with your studies.

Email address: _____

Appendix K – Study 3 Messages

High Descriptive Norm-High Positive Outcome Expectation:

Engaging in moderate-to-vigorous physical activity regularly has many benefits, including advantages associated with academic performance. For instance, it has been found that exercising enhances an individual's cognitive functioning. In particular, university students who exercise for at least the recommended 150 minutes per week are able to concentrate for longer, they have higher energy levels, and they generally perform better on academic exams. So how many students at the University of Saskatchewan maintain their activity over the two-week exam period? In a study conducted last year at the U of S, it was found that 63% of students were able to maintain their physical activity levels during the exam period. Of those who were able to maintain their activity levels, 90% reported grades on the final exam that equalled or surpassed grades obtained during the term. Join your fellow students in maintaining your exercise patterns over the exam period in order to perform better on your exams!

High Descriptive Norm-Low Positive Outcome Expectation:

Engaging in moderate-to-vigorous physical activity regularly has many benefits, including advantages associated with academic performance. For instance, it has been found that exercising enhances an individual's cognitive functioning. In particular, university students who exercise for at least the recommended 150 minutes per week are able to concentrate for longer, they have higher energy levels, and they generally perform better on academic exams. So how many students at the University of Saskatchewan maintain their activity over the two-week exam period? In a study conducted last year at the U of S, it was found that 63% of students were able to maintain their physical activity levels during the exam period. Of those who were able to maintain their activity levels, 10% reported grades on the final exam that equalled or surpassed grades obtained during the term. Join your fellow students in maintaining your exercise patterns over the exam period in order to perform better on your exams!

Low Descriptive Norm-High Positive Outcome Expectation:

Engaging in moderate-to-vigorous physical activity regularly has many benefits, including advantages associated with academic performance. For instance, it has been found that exercising enhances an individual's cognitive functioning. In particular, university students who exercise for at least the recommended 150 minutes per week are able to concentrate for longer, they have higher energy levels, and they generally perform better on academic exams. So how many students at the University of Saskatchewan maintain their activity over the two-week exam period? In a study conducted last year at the U of S, it was found that 13% of students were able to maintain their physical activity levels during the exam period. Of those who were able to maintain their activity levels, 90% reported grades on the final exam that equalled or surpassed grades obtained during the term. Join your fellow students in maintaining your exercise patterns over the exam period in order to perform better on your exams!

Low Descriptive Norm-Low Positive Outcome Expectation:

Engaging in moderate-to-vigorous physical activity regularly has many benefits, including advantages associated with academic performance. For instance, it has been found that exercising enhances an individual's cognitive functioning. In particular, university students who exercise for at least the recommended 150 minutes per week are able to concentrate for longer, they have higher energy levels, and they generally perform better on academic exams. So how many students at the University of Saskatchewan maintain their activity over the two-week exam period? In a study conducted last year at the U of S, it was found that 13% of students were able to maintain their physical activity levels during the exam period. Of those who were able to maintain their activity levels, 10% reported grades on the final exam that equalled or surpassed grades obtained during the term. Join your fellow students in maintaining your exercise patterns over the exam period in order to perform better on your exams!

Appendix L – Study 3 Final Survey

Dear participant,

Thank you for taking the time to fill out this final survey! The following questionnaire will take **approximately 5 minutes** to fill out. Please fill out the survey as honestly as possible. Completion and submission of your answers implies consent to participate. Further, you may leave any questions blank that you do not feel comfortable answering.

Participant ID: _____
In order to match your responses today to your previous responses, please write in the participant ID that was provided to you in the e-mail containing the link to this survey.

Last Day of Exams:
What date did you complete your last exam? _____

Exercise Behaviour Over the Exam Period

We are interested in how many minutes of moderate- and vigorous-physical activities you engaged in during the exam period. For the following questions, we want you to think about the period from **December 6th until the date of your final exam** (which you selected above).

1. Browse through the activities listed below and find all the activities that you did at a moderate (above normal breathing) or vigorous (heavy breathing) intensity during your specific exam period (Dec 6th until your final exam date).

2. Put one of your activities under "Activity #1" below, and answer the 3 questions that follow that are related to that activity.

3. You will repeat this process until all of the activities you have engaged in have been accounted for (up to a total of 7 activities).

If you did no activities, please skip to the bottom of the page and press "next."

Aerobics	Badminton	Basketball	Boxing	Biking/Cycling
Bowling	Cardio machine	Dance (specify)	Figure skating	Gymnastics
Ice Hockey	Martial Arts	Racquetball	Ringette	Running/jogging
Running/Jogging	Skipping	Skiing-X country	Skiing-Downhill	Snowboarding
Soccer	Speed Skating	Street/Floor hockey	Swimming-synchro	Swimming-Laps
Tennis	Track & Field	Volleyball	Wrestling	Walking
Wall Climbing	Weight lifting	Yoga	Other	

Activity #1

If you did not engage in any activities over the exam period, please scroll down to the bottom of the page and click "next."
Enter one activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period** (from December 6th until your final exam date).

1a) Enter the number of times doing Activity #1 during your exam period. _____

1b) Record the <u>average</u> (not total) number of <u>minutes</u> you were *actually active* <u>each time</u> when engaging in Activity #1. **do not include time spent changing clothes, stretching, standing around, etc. _____**

1c) What was the average intensity at which you were active in Activity #1? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

<u>Activity #2</u>

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

2a) Enter the number of times doing Activity #2 during your exam period. _____

2b) Record the <u>average</u> (not total) number of <u>minutes</u> you were *actually active* <u>each time</u> when engaging in Activity #2. **do not include time spent changing clothes, stretching, standing around, etc. _____**

2c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

<u>Activity #3</u>

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

3a) Enter the number of times doing Activity #3 during your exam period. _____

3b) Record the <u>average</u> (not total) number of <u>minutes</u> you were *actually active* <u>each time</u> when engaging in Activity #3. **do not include time spent changing clothes, stretching, standing around, etc. _____**

3c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #4

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

4a) Enter the number of times doing Activity #4 during your exam period. _____

4b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #4. **do not include time spent changing clothes, stretching, standing around, etc. _____**

4c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #5

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

5a) Enter the number of times doing Activity #5 during your exam period. _____

5b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #5. **do not include time spent changing clothes, stretching, standing around, etc. _____**

5c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #6

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

6a) Enter the number of times doing Activity #6 during your exam period. _____

6b) Record the average (not total) number of minutes you were *actually active* each time

when engaging in Activity #6. **do not include time spent changing clothes, stretching, standing around, etc. _____

6c) What was the average intensity at which you were active in Activity #6? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Activity #7

If you have listed all of the activities engaged in, please scroll down to the bottom of this page and click "next".

Enter the next activity from the list provided that you engaged in at a moderate or vigorous intensity **during your exam period.**

7a) Enter the number of times doing Activity #7 during your exam period. _____

7b) Record the average (not total) number of minutes you were *actually active* each time when engaging in Activity #7. **do not include time spent changing clothes, stretching, standing around, etc. _____

7c) What was the average intensity at which you were active in Activity #2? Light (slight change from normal breathing)/Moderate (above normal breathing)/Vigorous (heavy breathing)

Manipulation Checks

1) How much did the information in the message motivate you to maintain your exercise levels over the exam period?

1	2	3	4	5	6	7
NOT AT ALL						VERY MUCH

2) The information in the message was *believable*.

1	2	3	4	5	6	7
STRONGLY DISAGREE						STRONGLY AGREE

3) The information in the message was *persuasive*.

1	2	3	4	5	6	7
STRONGLY DISAGREE						STRONGLY AGREE

4) The information in the message was *easy to understand*.

1	2	3	4	5	6	7
STRONGLY DISAGREE						STRONGLY AGREE

Appendix M – Study 3 Debriefing Letter

Kevin S. Spink, Ph.D.
College of Kinesiology, University of Saskatchewan
87 Campus Drive,
Physical Activity Complex
Phone: (306) 966-1074
Email: kevin.spink@usask.ca

Dear Participant:

Thank you for taking the time to participate in our study on exercise over the exam period. It is important that we continue to investigate the exercise patterns of undergraduate students over the examination period and what influences individuals to maintain their regular physical activity routines.

By way of clarification, you were told that the general purpose of the study was to examine exercise patterns over the exam period. However, we also wanted to understand the influence of a normative message on individual exercise behaviour. Specifically, we were interested in examining the effect of being told about others' exercise behaviour (i.e., how many other University of Saskatchewan students were able to maintain their physical activity levels during exams and how that was associated with academic performance) on individual exercise behaviour. While we know that being active is associated with better academic performance, we needed to create specific norm messages to examine how these different norms might influence your own behaviour. As we crafted the specific norm you received, it is possible that the exercise behaviour comparisons that you received about university students may have differed from the actual exercise levels of that group. As we mentioned previously, you are still able to withdraw your data at this point with absolutely no penalty.

If you are interested in learning more about the findings of this study, we will be pleased to provide a summary to you. To receive this summary, please contact me at the address listed above and I will mail the summary to you. If you have any further questions about the study itself, please feel free to contact me.

Once again, thank you for making a valuable contribution to our research.

Sincerely,

Kevin S. Spink, Ph.D.
Professor