MAN-MADE MESSAGES: INVESTIGATING THE INFLUENCE OF
HEALTH MESSAGING ON MEN’S PHYSICAL ACTIVITY
BEHAVIOURS

by

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Abstract

Men engage in fewer health-promoting behaviours than women. Despite being more active than women, the majority of men are inactive. Physical activity (PA) decreases the risk of developing numerous chronic conditions and may be an optimal behaviour to target in men’s health interventions. However, informational resources and health-promotion interventions for men are lacking. To address this gap, we conducted two studies using the Extended Parallel Process Model (EPPM; Witte, 1992) as a guiding framework. Study 1 examined relevant and appealing health message content for men and explored the relevance and applicability of EPPM constructs to men’s health messages and PA messages in particular. Four semi-structured focus groups and four semi-structured telephone interviews were conducted. Participants (n=26) easily related to the EPPM constructs. Participants preferred demographically-tailored health messages that addressed modifiable behaviours (e.g. PA) and self-regulatory strategies (e.g. planning) and included reputable sources, strong language, and sex appeal. From these findings, four sets of PA messages with different combinations of risk and efficacy information were developed. Study 2 tested the effectiveness of these EPPM-based messages to increase men’s PA intentions and behaviours. Inactive participants (n=353) were randomly assigned to one of four message groups and read four health messages over four consecutive days. Intentions were assessed at baseline and the first follow-up (Day 5) while manipulation check items were assessed at Day 5. PA behaviour was assessed at baseline and the second follow-up (Day 14). Men who received low efficacy and risk information were less likely to meet the Canadian PA guidelines at Day 14 than
men who only received low efficacy information (OR=2.15 95% CI:0.963-4.80, Wald=3.49, p=0.062). Providing risk information led to increases in PA behaviours (F(1, 157)=7.29, p=0.008, \(d=.22\)). Intentions to be active were greater in the high efficacy group than the low efficacy group (F(1, 345)=4.10, p=0.044, \(d=.21\)). Bivariate correlations indicated a disconnect between fear and efficacy perceptions, intentions, and defensive avoidance. From these collective findings, we provide insight into the EPPM as it relates to men’s PA behaviours, propose preliminary recommendations regarding the development of PA messages for men, and suggest areas for future research.

**Key Words:** men, health, physical activity, messages, risk, efficacy, Extended Parallel Process Model
Co-Authorship

This thesis presents the original work of Alexandra Hatchell in collaboration with her supervisor, Dr. Amy Latimer, and her co-authors, Marie Clarke and Stacey Kimura from the Hastings and Prince Edward Counties Health Unit (Belleville, Ontario).

Manuscript 1: What men want: A qualitative investigation of men’s health concerns and relevant health and physical activity message content for men has been prepared for submission to the American Journal of Health Behavior. Alexandra Hatchell developed the concept for the study and was primarily responsible for the creation of study materials, conducting the study, performing data analysis, interpreting the study results, and drafting the original manuscript. Alexandra’s supervisor and co-authors were actively involved in the planning and execution of the study and the preparation of the manuscript.

Manuscript 2: From Couch Potato to Iron Man: Comparing the effectiveness of messages based upon the EPPM in relation to men’s physical activity behaviours is currently being prepared for submission to Health Psychology. Alexandra Hatchell developed the concept for the study and was primarily responsible for the creation of study materials, conducting the study, performing data analysis, interpreting the study results, and drafting the original manuscript. Alexandra’s co-authors, Marie Clarke and Stacey Kimura, were involved in the planning of the study and the preparation of the manuscript. Alexandra’s supervisor, Dr. Amy Latimer, was instrumental in the planning and execution of the study and the preparation of the manuscript.
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Chapter 1

Introduction

1.1 Overview

Men worldwide have a lower life expectancy than women (World Health Organization, 2010). Compared to women, men engage in more risky lifestyle behaviours that increase their risks of developing chronic conditions such as obesity, type II diabetes, and cardiovascular disease (Courtenay, 2000). All of these chronic conditions likely play a role in contributing to premature death among men. Consequently, there is a need to create health communication interventions that aim to increase men’s intentions and participation in health behaviours, such as physical activity.

It is hypothesized that men’s lack of involvement in health behaviour practices may be due to their conformity to the hegemonic masculine role and a lack of educational resources (Courtenay, 2000). Therefore, there has been a call for informational health resources and health interventions for men that are created with gender roles in mind (Coles et al., 2010; Sloan, Gough, & Conner, 2010). When considering the content of these informational resources and health communication interventions, it is important to use a guiding theoretical framework that outlines the key behavioural constructs to target (Brawley & Latimer, 2007). Men who conform to male gender norms do not perceive their lack of health behaviours as adverse or risky. Because the Extended Parallel Process Model (EPPM; Witte, 1992) identifies risk perceptions as a key construct to address, it was chosen as the guiding theoretical framework for this thesis project.
1.2 Primary Thesis Objectives and Hypotheses

The overall purpose of this thesis was to determine relevant and appealing health message content for men and to test whether messages based upon the tenets of the EPPM were effective at increasing men’s intentions and physical activity behaviours. To address this overarching purpose, two studies were conducted.

1.2.1 Study 1

The purpose of the first study was to determine relevant and appealing message content for men and to examine the utility and relevance of the EPPM to men and their health behaviours. Due to the inductive and exploratory nature of this qualitative investigation, no hypotheses were proposed.

1.2.2 Study 2

The purpose of the second study was to determine the most efficacious combination of risk and efficacy information to encourage men to increase their physical activity levels in order to meet Canada’s Physical Activity Guidelines.

We hypothesized the following:

(a) Men who received messages with both risk and high efficacy information would be the most likely to increase their physical activity levels and meet the Canadian Physical Activity Guidelines at the two-week follow up.

(b) Men who received messages with both risk and low efficacy information would be the least likely to increase their physical activity levels and meet the Canadian Physical Activity Guidelines at the two-week follow up.
(c) Men who received messages with both risk and high efficacy information would have greater intentions to be active than men who received both risk and low efficacy information.

(d) Increased perceptions of susceptibility and severity would be associated with more fear.

(e) Lower levels of task and scheduling self-efficacy and response efficacy would be associated with more fear.

(f) Higher levels of defensive avoidance would be associated with lower levels of physical activity participation.

(g) Greater fear would be related to greater intentions to meet the Canadian Physical Activity Guidelines at the first follow-up (Day 5) and higher levels of physical activity participation at the two-week follow-up.

1.3 Thesis Organization

This thesis conforms to the regulations outlined in the Queen’s University School of Graduate Studies and Research “General Forms of Theses” document. The second chapter provides a review of literature that focuses on thesis-related topics. The third chapter contains the first manuscript which explores men’s health concerns and relevant health and physical activity message content for men. This manuscript has been prepared for submission to the American Journal of Health Behavior. The fourth chapter contains the second manuscript which examines the most effective type of messages based upon the tenets of the EPPM to increase men’s intentions and physical activity behaviours. This manuscript is currently being prepared for submission to Health Psychology. The
fifth chapter contains a general discussion of the entire thesis. Finally, appendices are located at the end of the document and contain copies of all materials used to conduct the two studies of this thesis.

1.4 References


Chapter 2
Literature Review

2.1 Men’s Health, Life Expectancy, and Health Behaviour Practices

Canadian men more frequently suffer from and subsequently succumb to a variety of severe and chronic conditions compared to Canadian women (Statistics Canada, 2010). Death rates attributed to certain cancers, circulatory diseases, and respiratory diseases are higher among men than women (Statistics Canada, 2010). Consequently, as of 2010, Canadian men have a lower life expectancy than Canadian women by approximately five years (Statistics Canada, 2010). These health and life expectancy trends have also been documented in other countries worldwide including the United States of America, the United Kingdom, and China (Courtenay, 2000a; 2003; Verbrugge, 1986; World Health Organization, 2010).

Given their increased risk of mortality across a multitude of chronic conditions, it is not surprising that men are less likely than women to engage in health-promoting behaviours and are more likely than women to engage in risky behaviours (Courtenay, 2000a; 2000b; 2003; Courtenay, Mccreary, & Merighi, 2002; Doyal, 2001; von Brothmer, 2005; Verbrugge, 1986; Williams, 2003). For example, men are more likely to smoke tobacco, engage in heavy drinking, and consume fewer fruits and vegetables than women (Courtenay 2000b; 2003; Statistics Canada, 2010; Williams, 2003). In terms of risky behaviours, men are more likely than women to engage in reckless driving and unsafe sexual practices – including having unprotected sexual activities and having numerous sexual partners (Courtenay, 2000a; 2000b; 2003; Doyal, 2001). Men are also
more likely than women to have a dangerous occupation, such as working in the mining, construction, fishing, and timber cutting industries (Courtenay, 2000a; 2000b; Williams, 2003). These workforces have some of the highest injury death rates in the United States of America (Courtenay, 2000a; 2000b; Williams, 2003).

Regardless of their increased risk of chronic conditions and engagement in unsafe behaviours, men are less likely than women to seek medical care (Coles et al., 2010; Courtenay 2000a; 2000b; Doyal, 2001; Galdas, Cheater, & Marshall, 2005; Verbrugge, 1986; Williams, 2003). Specifically, men are less likely than women to visit a physician, use certain health care services, engage in screening procedures, and perform self-examinations (Courtenay 2000a; 2000b; Galdas, Cheater, & Marshall, 2005; Verbrugge, 1986; Williams, 2003).

2.2 A Rationale for Men’s Health Behaviour Practices

2.2.1 Gender Roles within Western Society

One of the dominating perspectives that attempts to explain the lack of healthy behaviours and excess of risk-taking behaviours displayed by men is rooted in a sociocultural context and centered around gender (Courtenay, 2000a). For years, gender roles in Western society have defined what it is to be feminine or masculine (Courtenay, 2000a). Consequently, stereotypic beliefs of these roles have been created and conformed to by the greater society (Courtenay, 2000a). Research has indicated that men tend to experience greater pressures than women to conform to these stereotypic gender roles (Courtenay, 2000a). Specifically, the masculine role that dominates our Western culture is the hegemonic masculine role (Courtenay, 2000a). Hegemonic masculinity is
defined as an ideal form of masculinity where men exert dominance, power, and authority over other individuals (Courtenay, 2000a). This specific gender role is exemplified by men who are independent, self-reliant, strong, robust, and tough (Courtenay, 2000a; Williams, 2003). Currently, hegemonic masculinity tends to be embraced and displayed by men in Westernized cultures who are heterosexual, highly educated, and have a high socioeconomic status (Courtenay, 2000a).

It has been argued that avoiding health behaviours may provide a way for men to further construct and maintain their hegemonic masculine role and ideals (Courtenay, 2000a; Doyal, 2001; Galdas, Cheater, & Marshall, 2005; Williams, 2003). For example, when men refuse to acknowledge their injuries or illnesses and dismiss medical care, they are dismissing any potential weaknesses or vulnerability that may deconstruct their hegemonic role (Courtenay, 2000a; Doyal, 2001; Galdas, Cheater, & Marshall, 2005; Verbrugge, 1986). Furthermore, engaging in risky behaviours such as excessive drinking, smoking, reckless driving, and unsafe sexual practices provide men with the opportunity to conform to the hegemonic role by embracing the potential risks and displaying a fearless frame of mind (Courtenay, 2000a; Doyal, 2001).

Men’s avoidance of health care services may be due to their own conformity to the masculine gender role as well as trying to satisfy their general practitioners’ health care philosophies. In a recent qualitative study by Hale, Grogan, and Willott (2010), male general practitioners’ perspectives on men’s health behaviours were examined. The physicians identified men who rarely visited their general practitioners as stoic and more masculine. Conversely, the physicians viewed men who frequently visited their general practitioners as less masculine. Despite trying to deliver equal health care services to
their patients, male general practitioners also are influenced by their perceptions of the hegemonic male gender role. As a result, male physicians may deter health-care seeking men from using health care services on a frequent basis.

However, not all men engage in unhealthy and risky behaviours that are conventional to the masculine stereotype. Some men engage in health behaviours. The personality characteristics of these men have been examined. A study by Kaplan and Marks (1995) found that the number of health behaviours performed by men is influenced by their masculine identities. Specifically, men who are considered to be “highly feminine” exhibit greater health concerns and increased awareness about their health statuses. Sloan, Gough, and Conner (2010) also examined how the masculine identity is constructed by men who regularly engage in healthy behavioural practices. In this case, the men tended to downplay the importance of health concerns in the decision making process to adopt more healthy lifestyles. Instead of health concerns, the men expressed that the dominant reasons for their lifestyle choices were to be able to play sports and improve their body image. Therefore, although these men may participate in fewer unhealthy and risky behaviours, the hegemonic role is still present as these men attribute their lifestyle choices to reasons that are not associated with weaknesses or vulnerability to a given health concern.

Due to the presence and constructed hegemonic masculine role in Western society, health promotion interventions should be gender-specific (Courtenay, Mccreary, & Merighi, 2002; Doyal, 2001; Sloan, Gough, & Conner, 2010). Specifically, interventions that are targeted towards men should be framed with the hegemonic stereotype in mind (Courtenay, Mccreary, & Merighi, 2002; Doyal, 2001; Sloan, Gough,
For example, engaging in healthy behaviours should be promoted as an independent choice that displays strength and a rationale frame of mind (Sloan, Gough, & Conner, 2010). By addressing gender stereotypes when creating health behaviour interventions, men may take interest in the program rather than avoid health-promoting behaviours that have previously been considered to be feminine in nature.

2.2.2 Health and Informational Resources Available to Men

While it is important to consider gender roles as a contributing factor to men’s behaviours, men’s failure to engage in health behaviour practices may also be attributed to a lack of educational resources. Educational efforts for healthy lifestyle practices have been primarily targeted at women (Courtenay, 2000a). In comparison to women, men tend to receive less information and advice from medical practitioners about how to incorporate changes into their lifestyles to reduce their risk of chronic diseases (Courtenay, 2000a; Courtenay, Mccreary, & Merighi, 2002; Coles et al., 2010; Verbrugge, 1986).

Research regarding health messaging is crucial for the development of health messaging interventions and educational resources. However, there has been an overrepresentation of women in health messaging research (Latimer, Brawley, & Bassett, 2010). For example, health messaging studies tend to have a female participant majority or are only conducted with women (Latimer, Brawley, & Bassett, 2010). Therefore, current recommendations for health messages may not be entirely applicable to men. The insufficient amount of educational resources, research, and advice available to men has not gone unnoticed. The lack of informational resources specific to men was considered
to be a concern during a recent qualitative study with men in Great Britain (Coles et al., 2010).

Coles and colleagues (2010) believed that the inequality of health care usage between men and women could be attributed to the way men perceived their health care needs. To gain further insight into men’s perspectives of their health care needs, a series of focus groups were conducted. Through these focus groups, it became evident that men were dissatisfied with the lack of health care services that were offered and accessible to them, such as regular check-ups and routine screening programs. The men also felt they were not well informed about the health care services that they could access to have their questions and concerns answered in a timely manner. Evidently, future health promotion interventions must address this gap in order to restore health care and informational resource equality among men and women.

2.3 Men and Physical Activity

When developing health promotion interventions for men, it is important to think about the most appropriate health behaviour to address. Physical activity may be an optimal behaviour to target. Although men are more physically active than women, the majority is still inactive (Canadian Fitness and Lifestyle Research Institute, 2008). Specifically, 83% of Canadian men are not currently meeting the Canadian Physical Activity Guidelines (Appendix F; Colley et al., 2011). Physical inactivity in combination with other unhealthy lifestyle practices may be responsible for the higher rates of overweight and obesity amongst Canadian men versus women (Statistics Canada, 2010). It is widely accepted that physical activity decreases the risk of developing more than 25
conditions including cardiovascular disease, certain types of cancer, Type II Diabetes, and obesity (Warburton, Katzmarzyk, Rhodes, & Shephard, 2007). Obesity is also a risk factor for numerous chronic conditions such as coronary heart disease, Type II Diabetes, and sexual dysfunction (Esposito et al., 2008; Van Gaal, Mertens, & De Block, 2006; Wang, Rimm, Stampfer, Willett, & Hu, 2005). By creating health communication interventions that focus on increasing physical activity behaviour, reductions in risk for a variety of chronic conditions may be obtained. Consequently, in comparison to health interventions that focus on other health behaviours, physical activity interventions may be more efficient in terms of cost, effort, and time commitment.

Of further benefit, physical activity may be considered a gateway behaviour. Specifically, individuals who are physically active tend to adopt more healthy behaviours (Blair, Jacobs, & Powell, 1985; Laaksonen, Luoto, Helakorpi, & Uutela, 2002; Steptoe et al., 1997). For example, epidemiological evidence has indicated that increases in physical activity are associated with decreases in smoking habits and unhealthy diets (Laaksonen, Luoto, Helakorpi, & Uutela, 2002; Steptoe et al., 1997). Increases in physical activity also have been associated with improved sleeping habits and mental health (Steptoe et al., 1997). Finally, individuals who engage in physical activity may be more likely to access preventative medical and dental health services than inactive individuals (Blair, Jacobs, & Powell, 1985). This trend may be due to the fact that individuals who are more physically active may adopt more healthy demeanours and subsequently attend more medical appointments than inactive individuals. Therefore, although men participate in a variety of problematic behaviours, men’s health interventions should focus on physical activity. By targeting a gateway behaviour such
as physical activity, men’s health interventions may be more efficient by indirectly decreasing other prevalent unhealthy behaviours and increasing health-promoting behaviours.

Men who conform to the male gender role also may be more inclined to adopt physically active lifestyles. Specifically, engaging in physical activity may be viewed as less feminine than other health behaviours (e.g. preventative screenings) and could give men a sense of autonomy and personal control over their health (Sloan, Gough, & Conner, 2010). There is substantial evidence indicating that increases in physical activity levels may decrease the risk of numerous chronic diseases (Warburton, Katzmarzyk, Rhodes, & Shephard, 2007). As a result, physical activity could be perceived to be an activity that can be performed independently to improve one’s health without further help from medical practitioners and medications. Physical activity may also be an ideal behaviour to target with men’s health interventions due to the large associations between masculinity and sport, a type of physical activity (Sloan, Gough, & Conner, 2010). Specifically, sports allow men to display traits that conform to male gender roles, including dominance, competitiveness, and strength (Sloan, Gough, & Conner, 2010). Men who do not strongly identify with male gender roles and are health-conscious may also find physical activity appealing due to its numerous health benefits. Evidently, physical activity should be a targeted behaviour in men’s health interventions.

2.4 Theoretical Framework

Another important idea to consider when developing health messages is choosing a theoretical framework to use as the basis for message content (Brawley & Latimer,
A theoretical framework outlines the important behavioural constructs that may affect a given health behaviour (Brawley & Latimer, 2007). Therefore, messages should be created to influence the key behavioural constructs of the chosen theoretical framework (Brawley & Latimer, 2007; Latimer, Brawley, & Bassett, 2010). A theoretical framework is a valuable tool that allows researchers to gain greater insight into the determinants of health behaviour change (Brawley & Latimer, 2007; Rothman, 2004). By using a theoretical framework to guide health behaviour interventions, researchers may continue to test, refine, and build upon different theoretical constructs (Rothman, 2004). Therefore, in my thesis I used a theoretical model to gain greater understanding into the factors that influence men’s intentions and physical activity behaviours. By gaining insight into these behavioural constructs, health interventions for men can be created to subsequently reduce their risk of developing chronic diseases that may result in poorer life expectancy.

2.5 Men, Risk Perceptions, and the Extended Parallel Process Model

As I have already established, men who conform to the hegemonic gender role do not believe they are vulnerable to health threats and do not perceive their adverse behaviours as risky (Courtenay, 2000a; 2000b; 2003). In the health behaviour change literature, risk perception has been identified as a predictor of intention and subsequent behaviour (Brewer et al., 2007; Schwarzer et al., 2007; Schwarzer, 2008). Risk perceptions are individuals’ beliefs in the risk or threat of engaging or not engaging in a specific behaviour (Schwarzer et al., 2007; Schwarzer, 2008). Risk perception has been identified as a predictor of intentions and included as a construct in health behaviour
change theories, such as the Health Belief Model (Janz & Becker, 1984), Protection Motivation Theory (Rogers, 1975), the Heath Action Process Approach (Schwarzer, 2008), and the Extended Parallel Process Model (Witte, 1992).

Individuals who have not yet created intentions to engage in a given behaviour appear to be the most influenced by risk perceptions in comparison to individuals who have formed intentions or have already started to engage in the behaviour (Lippke, Ziegelmann, & Schwarzer, 2005). Because men perceive themselves to be invulnerable to health threats (Courtenay, 2003), it is possible that they have yet to form intentions to engage in health behaviours. Consequently, risk perception may be an appropriate construct to target when developing health messages to elicit positive health behaviour change amongst men.

The Extended Parallel Process Model (EPPM; Witte, 1992) positions risk perceptions as a key construct to target in health communication interventions. The model is rooted in the research field of fear appeals. Fear appeals are messages that are persuasive and designed to frighten the reader through describing the harmful consequences that will occur if the reader continues to engage in the risky behaviour and does not adopt the message’s prescribed response (Witte and Allen, 2000). Thus, fear appeal messages provide a way to inform men about the risks and consequences of their current behaviours. By providing these messages, the health threat will become more relevant and increase men’s risk perceptions which may subsequently affect men’s intentions and behaviours. Therefore, in order to investigate the effects of fear appeal messages on men’s decisions to engage in healthy behaviours, I used the EPPM as the guiding theoretical framework for my thesis.
2.6 The Extended Parallel Process Model Defined

The EPPM (Figure 1; Witte, 1992) suggests that upon reading a fear appeal message, readers will perform two separate appraisals that will lead to one of three potential outcomes. The first appraisal occurs when readers evaluate whether the behaviour and subsequent consequences described in the message are threatening. During this threat appraisal, readers characterize the perceived severity (i.e. the seriousness of the threat) and their perceived susceptibility (i.e. their chances of experiencing the threat). If readers perceive the threat as non-existent or low, they will not be motivated to process and respond to the fear appeal message (Figure 2). However, if readers perceive the threat as moderate or high, they will experience fear. The perceived fear will motivate readers to take action to reduce their fears, and therefore they will begin the second appraisal of the message.

Figure 1. The Extended Parallel Process Model (Witte, 1992).

Message Components:
a) Susceptibility
b) Severity
c) Response Efficacy
d) Self-Efficacy

Appraisal #1 – Perceived Threat:
- Susceptibility
- Severity

Appraisal #2 - Perceived Efficacy:
- Response Efficacy
- Self-Efficacy

No Perceived Threat: No Response

Protection Motivation → Message Acceptance

Fear

Defensive Motivation → Message Rejection

Message Acceptance
Figure 2. The response of individuals upon reading a low threat message based upon Extended Parallel Process Model (Witte, 1992).

During the second appraisal, readers evaluate the efficacy of the message. The readers characterize the perceived response efficacy (i.e. whether the suggested response effectively prevents the threat) and their perceived self-efficacy (i.e. whether they can successfully perform the recommended response). The efficacy appraisal is important as it will determine whether individuals will engage in danger or fear control processes. Protection and defense motivation, the first stages of danger and fear control processes, respectively, have been considered to be analogous to individuals’ intentions to engage in a given behaviour (Milne, Sheeran, & Orbell, 2000).

Readers will engage in danger control processes if both perceived threat and efficacy are high (Figure 3). Danger control processes are elicited when readers accept the message. It has been suggested that danger control processes are deliberate and require volitional thought (Witte, 1992). In this case, readers engage in protection motivation. The readers become motivated to think of adaptive strategies and form intentions and plans to adopt favorable behaviours that will protect them from acquiring the threat described in the message.
Figure 3. The readers’ responses to a high threat and high efficacy message based upon Extended Parallel Process Model (Witte, 1992).

Likewise, readers will engage in fear control processes if perceived efficacy is low (Figure 4). Fear control processes are elicited when readers believe they cannot effectively combat the health threat. Fear control processes have been described as emotional in nature and may occur with or without volitional thought (Witte, 1992). When individuals adopt fear control processes, they tend to engage in defensive motivation. In this situation, readers perform maladaptive coping strategies such as denying the existence of the threat and continuing to participate in risky behaviours to reduce their anxieties and fears. Evidently, there is a critical point as to whether individuals engage in danger or fear control processes with danger control processes being more favorable than fear control processes. The former occurs when individuals’ perceived efficacy outweighs their perceived threat while the latter occurs when individuals’ perceived threat outweighs their perceived efficacy.
Figure 4. The response of individuals upon reading a high threat and low efficacy message based upon Extended Parallel Process Model (Witte, 1992).

2.7 Individual Difference and Responses to Fear Appeal Messages Based Upon the EPPM

It is highly unlikely that all individuals will appraise identically both the threat and efficacy of a fear appeal message due to inherent individual differences (Witte, 1992). Specifically, individual differences in threat and efficacy appraisals will affect the critical point where individuals will either engage in protection or defensive motivation (Witte, 1992). Researchers have discovered trends in individuals’ responses to a fear appeal depending on certain personality characteristics (Witte, 1992). For example, individuals who have high anxiety, low self-esteem, poor coping skills, or an increased sense of vulnerability are prone to engage in defensive motivation when faced with strong fear appeals (e.g. high perceived threat; Witte, 1992). The defensive motivation responses are likely the result of the low perceived efficacy that individuals with these personality traits tend to possess (Witte, 1992). Individual differences pertaining to these personality characteristics may be apparent among men due to differences in their strength of identification and conformity with the gender roles. However, I did not measure differences in personality characteristics in my thesis.
2.8 EPPM Research Applications

Previous research has used the EPPM framework to determine whether a fear appeal message is successful at eliciting changes in intentions and behaviours. For example, the EPPM has been quantitatively evaluated in the context of promoting condom use to prevent against the human papilloma virus (Witte, Berkowitz, Cameron, & McKeon, 1998), vitamin consumption to reduce homocysteine levels and risk of cardiovascular disease (McKay, Berkowitz, Blumberg, & Goldberg, 2004), sun protective behaviours (Cho, 2003), and meningitis prevention (Gore and Bracken, 2005). The results of these studies were consistent with the predictions of the EPPM where individuals who received a high threat/high efficacy message were more likely to adaptively respond than individuals who received other messages. These adaptive responses included developing positive attitudes and intentions and engaging in the behaviours that would reduce the readers’ chances of developing the targeted threats.

Furthermore, one particular EPPM-based study exclusively targeted men. Morman (2000) evaluated messages promoting testicular self-examinations (TSE) that were based upon the tenets of the EPPM. Messages were either fact- or narrative-based and included high threat information paired with either low or high efficacy information. Participants (n=80, M_{age}=21.13 ± 3.14 years) were randomly assigned to one of the four message groups. Immediately after exposure to the message, variables such as men’s attitudes, intentions, threat perceptions, and efficacy perceptions were assessed. Consistent with predictions of the EPPM, men who received a high threat/high efficacy message were more likely to form intentions to perform TSEs than men who received a high threat/low efficacy message. No differences between the type of message (fact or narrative) were found. Because performing TSEs may eventually cause men to seek
medical attention, TSE may be classified as a feminine behaviour (Courtenay, 2000a). Consistent with the hegemonic gender role theory, men who identified more strongly with the traditional masculine gender role were more likely to have negative attitudes towards TSEs and were less likely to form intentions to perform TSEs versus men who identified less strongly with the traditional masculine gender role. Therefore, there is still a need to investigate whether EPPM messages that address a behaviour that is not entirely polarized as feminine or masculine, such as physical activity, positively affects men’s intentions and behaviours.

Other research applications of the EPPM have included qualitative evaluations where focus groups were conducted with both men and women to explore attitudes and beliefs towards a variety of health behaviours. For example, EPPM-directed focus groups discussed behaviours that included unsafe sexual practices and teen pregnancy (Witte, 1997), HIV transmission (Cameron, Witte, Lapinski, & Nzyuko, 1999), and lack of hand-washing (Botta, Dunker, Fenson-Hood, Maltarich, & McDonald, 2008). Murray-Johnson and colleagues (2004) used EPPM-directed focus groups amongst men who worked as coal miners to discuss noise-induced hearing loss due to lack of hearing protection. Through these focus group discussions, participants’ perceived susceptibility, severity, response efficacy, and self-efficacy were evaluated. This information was used to create new health messages about the aforementioned health behaviours.

2.9 EPPM and Physical Activity

To date, no research has been conducted to examine whether the EPPM is a valuable tool to use when creating health messages to promote physical activity. Bonnar-
Kidd, Black, Mattson, and Coster (2009) evaluated physical activity websites to determine whether physical activity messages were consistent with the constructs and principles of the EPPM. It was discovered that many physical activity websites incorporated messages about severity (64% of websites), susceptibility (49%), self-efficacy (90%), and response efficacy (100%), but the quality and accuracy of the physical activity information and messages were poor. However, this study did not evaluate the impact of these messages. Thus, it is unknown how individuals respond to physical activity messages based upon the tenets of EPPM and is an area for future consideration.

**2.10 Summary**

Overall, it is evident that men engage in lifestyle behaviours that may increase their risk of developing chronic conditions that could result in premature death, such as obesity and cardiovascular disease (Statistics Canada, 2010; Courtenay 2000a; 2000b; 2003; Doyal, 2001). Physical activity is a feasible strategy to decrease men’s risk of developing the aforementioned conditions and increase men’s life expectancy and quality of life (Warburton, Katzmarzyk, Rhodes, & Shephard, 2007). However, there is currently a lack of informational health resources and health-promotion interventions for men to encourage the adoption of health behaviours such as physical activity. Therefore, the first study of my thesis attempted to determine health message content that is both relevant and appealing to men.

It is also evident that despite engaging in various problematic behaviours, men do not perceive these behaviours as risky (Courtenay, 2003). Therefore, it may be important to target risk perceptions in health messages for men. Due to its central focus on risk
perceptions, the EPPM may be a viable model to develop and create messages to enhance men’s intentions and physical activity behaviours. Although the EPPM has previously been used to promote the adoption of a variety of health behaviours, no studies known to date have explored using the EPPM as a theoretical framework to increase individuals’, and specifically men’s, physical activity behaviours. Thus, the second study of my thesis tested the efficaciousness of physical activity messages based upon the tenets of the EPPM to increase men’s intentions and physical activity behaviours.
2.11 References


Chapter 3

What men want: A qualitative investigation of men’s health concerns and relevant health and physical activity message content for men.
Abstract

Despite having an increased risk of morbidity and mortality, men engage in fewer health-promoting behaviours than women. Informational health resources and health-promotion interventions for men are lacking. To address this gap, we conducted a qualitative investigation using the Extended Parallel Process Model (EPPM; Witte, 1992) as a guiding framework. The purpose of this study was to examine the relevance and applicability of EPPM constructs for health messages. Physical activity emerged as a prominent theme and consequently, this study also provides insight into the applicability of the EPPM for developing physical activity messages for men. Four semi-structured focus groups and four semi-structured telephone interviews were conducted. Participants discussed the relevance of the EPPM constructs to health messages and provided feedback about health advertisements and messages. Participants included 26 men ($M_{age} = 37 \pm 7.3$ years) who were generally active (80.77%). Participants easily related to the EPPM constructs of susceptibility, severity, response efficacy, and self-efficacy to health messaging. In discussing these constructs, perceptions of control emerged as a theme and physical activity was identified as a controllable and desirable behaviour. Participants indicated that self-efficacy could be enhanced by adopting self-regulatory strategies (e.g. planning) to engage in health behaviours including physical activity. When evaluating health magazines and health messages based upon the tenets of the EPPM, participants preferred messages with demographically-tailored facts and statistics, reputable sources, strong language, and sex appeal. From these findings, we have
formulated preliminary recommendations regarding theory-based content for health and physical activity messages for men.

**Key Words:** men, health, physical activity, messages, Extended Parallel Process Model
Introduction

Men engage in more risky behaviours and fewer health-promoting behaviours than women (Courtenay, 2003). For example, men are more likely than women to consume fewer fruits and vegetables, smoke tobacco, and engage in heavy drinking, reckless driving, and unsafe sexual practices (Courtenay 2003). Men also are less likely than women to visit their physicians, use health care services, engage in screening procedures, and perform self-examinations (Courtenay 2000a; 2000b; 2003). Consequently, men have an increased risk of mortality across numerous chronic conditions including cardiovascular disease, Type II Diabetes, and different types of cancers (Courtenay, 2000b).

Men’s failure to engage in health promoting behaviours is attributable to a number of factors including a lack of educational resources. Compared to women, men receive less information and advice from physicians about lifestyle changes to reduce their risk of chronic diseases (Courtenay, 2000b). The insufficient amount of educational resources and health advice available to men has not gone unnoticed (Coles et al., 2010). As a result, there has been a call for informational health resources targeting men.

When considering the appropriate content of men’s health resources, it is important to examine the influence of social norms. For example, men’s conformity to gender roles explains, in part, their lack of healthy behaviours and excess of risk-taking behaviours (Courtenay, 2000b). The hegemonic masculine role dominates our Western culture. It is an ideal form of masculinity where men exert dominance, power, and authority over other individuals (Courtenay, 2000b). This gender role is exemplified by
men who are independent, self-reliant, strong, robust, and tough (Courtenay, 2000b; Williams, 2003). In the context of health behaviour, men who conform to the hegemonic gender role do not believe they are vulnerable to health threats and do not perceive their adverse behaviours as risky (Courtenay, 2000a; 2000b; 2003). Thus, targeting risk perceptions may be useful in the development of educational resources for men. Risk perception, or an individual’s belief about the risk or threat of engaging or not engaging in a behaviour, has been identified as a predictor of intention and subsequent behaviour (Brewer et al., 2007).

*Figure 1.* The Extended Parallel Process Model (Witte, 1992).

The Extended Parallel Process Model (EPPM; Witte, 1992) positions risk perceptions as a key theoretical construct and thus may be a suitable framework for guiding health communication interventions for men. The EPPM (Figure 1) suggests that upon reading a message, people perform two appraisals that lead to one of three potential outcomes. During the first appraisal, readers characterize the perceived severity (i.e. the seriousness of the threat) and their perceived susceptibility (i.e. their chances of experiencing the threat). If the perceived threat is low, individuals will not respond to the
message. However, if the perceived threat is moderate or high, individuals will experience fear and begin the second appraisal.

During the second appraisal, readers characterize the perceived response efficacy (i.e. whether the suggested response effectively prevents the threat) and their perceived self-efficacy (i.e. whether they can successfully perform the recommended response). If both perceived threat and efficacy are high, readers will engage in danger control processes. In this case, readers accept the message and engage in protection motivation, such that they become motivated to form intentions and plans to adopt behaviours that will protect them from acquiring the described threat. Likewise, readers will engage in fear control processes if perceived efficacy is low. In this situation, readers engage in defensive motivation and perform maladaptive coping strategies such as denying the threat and continuing to participate in risky behaviours.

The tenets of the EPPM have been tested in a series of experiments (Cho, 2003; Gore & Bracken, 2005; McKay, Berkowitz, Blumberg, & Goldberg, 2004; Witte, Berkowitz, Cameron, & McKeon, 1998) including one study that exclusively targeted men (Morman, 2000). This experiment evaluated EPPM-based messages promoting testicular self-examination (TSE). Consistent with predictions of the EPPM, men who received a high threat/high efficacy message were more likely to form intentions to perform TSEs than men who received a high threat/low efficacy message. Because performing TSEs may eventually cause men to seek medical attention, TSE may be classified as a feminine behaviour (Courtenay, 2000b). Therefore, there is still a need to investigate whether EPPM messages that address a behaviour that may be perceived as more masculine (e.g. physical activity) positively affect men’s intentions and behaviours.
The EPPM also has been used in a series of qualitative studies conducted to inform the content of health messages. For example, EPPM-based focus groups with both men and women discussed behaviours that included unsafe sexual practices and teen pregnancy (Witte, 1997), HIV transmission (Cameron, Witte, Lapinski, & Nzyuko, 1999), hearing protection (Murray-Johnson et al., 2004), and lack of hand-washing (Botta, Dunker, Fenson-Hood, Maltarich, & McDonald, 2008). Through these focus groups, participants’ perceived susceptibility, severity, response efficacy, and self-efficacy were evaluated and this information was used to create health messages. However, no qualitative studies known to date have evaluated the utility of the EPPM to inform health message content and create health messages for men.

To address this gap in the literature, the current study used the EPPM as a framework to guide a qualitative investigation of health message content that is both relevant and appealing to men. We investigated preferred message content for health messages in general and physical activity specifically. The topic for this specific focus emerged from discussions with participants. Due to the inductive nature of the study, no hypotheses were proposed.

**Method**

**Design**

Thematic analysis was the qualitative research tradition that informed this study. This qualitative study used an inductive approach and consisted of four semi-structured focus groups and four semi-structured telephone interviews. This design is congruent
with previous qualitative investigations of the EPPM (Botta, Dunker, Fenson-Hood, Maltarich, & McDonald, 2008; Cameron, Witte, Lapinski, & Nzyuko, 1999; Murray-Johnson et al., 2004; Witte, 1997). The focus group and telephone interview methodology was chosen to allow an open and collaborative environment where participants could express their true opinions and explore discussion topics that were meaningful to them.

**Demographic Measures**

Participants indicated their sex, age, racial background, education level, and marital status. Physical activity behaviour was assessed using the short-form International Physical Activity Questionnaire (International Physical Activity Questionnaire, 2001) – a valid and reliable self-report measure of physical activity (Craig et al., 2003).

**Procedure**

After consenting to participate in the audio-recorded focus groups and telephone interviews and completing the demographic questionnaire, the discussions began. A male research assistant conducted two focus groups. For logistical reasons, the principal investigator (A.H.), a female in her twenties, conducted the remaining two focus groups and the four telephone interviews.

During all focus groups and telephone interviews, participants were asked about what they considered to be unhealthy behaviours and the top five health concerns of men. Participants also were asked to review health magazines and identify which health
advertisements they found appealing. However, a fluid process was used when conducting the discussions about the EPPM (refer to Table 1 for discussion questions).
Table 1. Focus group and telephone interview discussion questions pertaining to the constructs of the Extended Parallel Process Model (Witte, 1992).

<table>
<thead>
<tr>
<th>EPPM Construct</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus Group #1</strong></td>
<td><strong>Perceived Severity</strong></td>
</tr>
<tr>
<td>1. In your opinion, how serious are these conditions (listed above) to your well-being?</td>
<td></td>
</tr>
<tr>
<td>2. Do you believe that these conditions pose a danger to one’s health and life expectancy?</td>
<td></td>
</tr>
<tr>
<td>3. What types of information or evidence would you need to make a decision as to whether a condition is serious?</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Susceptibility</strong></td>
<td></td>
</tr>
<tr>
<td>1. With your current lifestyle, do you believe that you are at risk for developing any of these conditions?</td>
<td></td>
</tr>
<tr>
<td>2. Which conditions do you think you are most susceptible to? Why?</td>
<td></td>
</tr>
<tr>
<td>3. What types of information or evidence would you need to make a decision as to whether you may be susceptible to developing and experiencing one of these conditions?</td>
<td></td>
</tr>
<tr>
<td><strong>Focus Group #2</strong></td>
<td><strong>Response Efficacy</strong></td>
</tr>
<tr>
<td>1. What types of responses do you think are the most effective strategies for combatting the effects of an unhealthy lifestyle? The least effective? Why?</td>
<td></td>
</tr>
<tr>
<td>2. What types of information or evidence would you need to make a decision regarding whether a given response actually prevents a condition from occurring or becoming worse?</td>
<td></td>
</tr>
<tr>
<td><strong>Self-Efficacy</strong></td>
<td></td>
</tr>
<tr>
<td>1. How confident are you in your ability to adopt a preventative response? Why or why not?</td>
<td></td>
</tr>
<tr>
<td>2. Do you think that you could create and execute an action plan to prevent conditions associated with an unhealthy lifestyle from taking place?</td>
<td></td>
</tr>
<tr>
<td>3. Which responses do you think are easier to perform? More difficult to perform? Why?</td>
<td></td>
</tr>
<tr>
<td>4. What types of information or evidence would you need to make you more confident in your ability to perform a given response?</td>
<td></td>
</tr>
</tbody>
</table>

*Note. EPPM = Extended Parallel Process Model.*
Table 1 Continued.

<table>
<thead>
<tr>
<th>EPPM Construct</th>
<th>Discussion Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Groups #3 and #4</td>
<td>1. What types of information are missing from the message and could be added to prove to you that the health threat is serious?</td>
</tr>
<tr>
<td>Perceived Severity</td>
<td>1. What types of information are missing from the message and could be added to prove to you that you could be susceptible to developing the health threat?</td>
</tr>
<tr>
<td>Perceived Susceptibility</td>
<td>1. What types of information are missing from the message and could be added to prove to you that physical activity is effective at reducing your health risk?</td>
</tr>
<tr>
<td>Response Efficacy</td>
<td>1. Do you have any ideas or examples that demonstrate that incorporating physical activity into your daily schedule can be easy?</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>2. What types of information are missing from the message and could be added to prove to you that physical activity is easy to add to your schedule?</td>
</tr>
</tbody>
</table>

*Note. EPPM = Extended Parallel Process Model.*
The initial two focus groups discussed the relevance of the EPPM constructs to health messages and reviewed current health advertisements. The responses from these focus groups were used to inform and develop four sets of high and low risk and efficacy messages based upon the EPPM. The risk messages addressed four health concerns for men – erectile dysfunction, chronic conditions (e.g. cardiovascular disease, Type II Diabetes), overweight and obesity, and problems with sexual performance. The risk messages pertaining to erectile dysfunction only focused on the risk factors and consequences of this specific sexual dysfunction. Meanwhile, the risk messages describing sexual performance focused on more general topics of sexual health, including libido, sexual desire, and sexual satisfaction. All of these targeted health concerns have been shown to be associated with physical inactivity (Esposito et al., 2008; Warburton, Katzmarzyk, Rhodes, & Shephard, 2007). Because participants identified physical activity as an effective and modifiable behaviour, it was prescribed in the efficacy messages as a behaviour that could prevent and attenuate the progression of these health conditions.

In addition to discussing health threats and reviewing the content of health magazines, participants in the remaining two focus groups and the four telephone interviews received handouts with the four unlabeled messages. Therefore, an additional objective of these discussions was to obtain feedback about the content of the sample risk (high/low) and efficacy (high/low) messages and determine how well these messages addressed the constructs of the EPPM.

Saturation of responses regarding unhealthy behaviours, health concerns and advertisements, and EPPM constructs were reached through all of the discussions.
Therefore, our fluid methodology was successful in achieving our goals of both evaluating the relevance of the EPPM and obtaining feedback about health advertisements and drafted health messages.

Data Analyses

Once the focus groups and telephone interviews were complete, the audio recordings were transcribed. A research assistant and the principal investigator independently read and systematically analyzed the transcripts using NVivo9 (QSR International Pty Ltd Version 9, 2010). Participants’ comments were initially classified into four general themes relating to the central EPPM constructs, including perceived severity, perceived susceptibility, response efficacy, and self-efficacy. Open coding was also used to identify new themes that were not associated with the four constructs of the EPPM. For example, these new themes tended to emerge during participants’ discussions of current health advertisements and feedback regarding the sample health messages. All transcripts were analyzed for each identified theme. Any inconsistencies between the coders’ analyses were resolved through the discussion of the context of the participants’ comments until a consensus between the two coders was reached.

Results

Participants

A convenience sample of 26 men (\(M_{age} = 36.77 \pm 7.30\) years) participated in this study in exchange for a $20 gift certificate to a home improvement store. Participants were recruited through workplace partnerships with a local public health unit and by
contacting local businesses. The majority of the participants were Caucasian (88.46%). Most participants had pursued post-secondary education with 46.15% of participants having either partially or entirely completed a college diploma and 42.31% of participants having either partially or entirely completed a university degree. The majority (80.77%) of the participants were currently meeting Canada’s Physical Activity Guidelines for aerobic activity (i.e., 150 minutes of moderate- to vigorous-intensity aerobic activity per week). On average, the men performed 168.54 minutes (SD = 182.88) of moderate- to vigorous-intensity aerobic activities per week (M = 2749.17 ± 4121.84 MET mins per week). Refer to Table 2 for participants’ demographic characteristics.

**Table 2. Demographic characteristics.**

<table>
<thead>
<tr>
<th></th>
<th>Total (n=26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years (M ± SD)</td>
<td>36.77 ± 7.30</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>88.5%</td>
</tr>
<tr>
<td>Minority</td>
<td>11.5%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Some High School or High School Diploma</td>
<td>11.5%</td>
</tr>
<tr>
<td>Some College or College Diploma</td>
<td>46.2%</td>
</tr>
<tr>
<td>Some University or University Degree</td>
<td>42.3%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>11.5%</td>
</tr>
<tr>
<td>Common Law, Engaged, or Married</td>
<td>69.2%</td>
</tr>
<tr>
<td>Divorced</td>
<td>3.9%</td>
</tr>
<tr>
<td>Other</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

**Perceived Severity and Susceptibility**

One of our objectives was to determine the types of behaviours that men consider to be unhealthy and the health conditions they consider severe and of primary concern.
Participants indicated that a variety of behaviours are unhealthy, including physical inactivity, poor dieting, and addiction behaviours such as excessive alcohol consumption, smoking, and drug use. They also believed that a lack of sexual activity and sleep and an increase in stress levels were unhealthy behaviours.

When asked about their top five health concerns, the men consistently identified different types of cancers (e.g. colon, prostate, testicular, lung), cardiovascular health, and overweight and obesity as health threats. The men also acknowledged physical inactivity as a health concern because it can be related to obesity and cardiovascular health. Erectile dysfunction, problems with sexual performance, and infrequent sexual activity also raised concern. Finally, chronic conditions including Type II Diabetes and arthritis, infrequent visits to a physician, and stress also were cited as health concerns for men.

While discussing the men’s health concerns, the theme of perceived control emerged. Participants believed that the seriousness of a condition is related to whether a person can control the prevention and development of the condition.

“The seriousness of condition is related to control and life habits. I mean with heart disease and cancer, genetics are a concerning factor, but you can’t do anything about it.”

Therefore, regardless of whether a condition was perceived to be serious, the men were not interested in reading health messages about conditions that identified genetics as a significant risk factor.

During the first focus group’s discussion about perceived severity and susceptibility, the idea of using facts and statistics to highlight the relevance of health
conditions emerged. This idea was further emphasized in later focus groups and telephone interviews when the participants were asked to look through health magazines. Participants consistently indicated that facts and statistics are important components of health messages. The men discussed how presenting statistics, or numbers, makes the text of the message easier to understand. However, the men expressed their skepticism about statistics that are presented in health advertisements.

“To me, it’s still a number because you have to look back at the statistics – what sample are you taking? Is it a valid sample? I am always going to question it. You know, it’s like the 4 out of 5 dentists recommend... which dentists? Well exactly! It becomes more of a catch phrase or a slogan than an actual valid statistic.”

Without acknowledging a source in the message, the men believed that these facts and statistics become common phrases that have no meaning. To be less doubtful of the message content, participants wanted to read facts and statistics that were supported by reputable sources. By providing these reputable sources, the men perceived the messages to be more credible and continued to think about and reflect upon the messages. Consequently, participants believed that they would be more motivated to think about and potentially act upon the health message.

“I love to see quotes from studies of something – you know actual scientific studies. Instead of it just being the opinion of the manufacturer of this drug, I would like to see them cite the study like, ‘in our study with 100 men, we found that such and such...’ ”

“Yeah – I like to see something with authority, either if it’s written by a medical doctor, or a trusted or respected organization. If this was like a drug company or
something, I would still be thinking, ‘Umm?’ But if it was the Heart and Stroke Foundation, I would be more convinced than if it was coming from a drug company or the studies they sponsor.”

In addition to including reputable sources, participants consistently expressed that to increase the relevance of the messages, facts and statistics should be tailored to the demographics of the audience. For instance, the men discussed that local and community-wide statistics were more relevant than Canada-wide statistics.

“That’s super local, but you know, if you say in relation to [City A], 100 men had cardiovascular problems that led to impotence, I would say ‘Huh, I probably know one of those guys’. It doesn’t matter what the number is – it’s making it local. The more local you can make it, the more impact it has.”

“Yeah – definitely want it to be in my kind of demographic and how I compare against other people who would be similar.”

Therefore, demographically-tailored messages captured the participants’ attention and interest. The men were motivated to think about how they compared to the people described in the messages. Participants agreed that local facts and statistics have a much greater impact on the reader than nation-wide facts and statistics.

**Response Efficacy**

Similar to gauging the seriousness of a condition based upon genetics, the idea of perceived control also emerged during discussions about response efficacy. Because the men acknowledged they did not have control over their genetic make-up, they did not believe that they could prevent conditions associated with genetics. Thus, participants
were not concerned about engaging in behaviours to prevent a condition if genetics were a risk factor.

However, the men agreed that physical activity and healthy eating were behaviours that they could control. Participants also believed that these types of modifiable behaviours were effective at combatting different chronic conditions.

“I think exercise and diet are the two things anyone can have any control over – you know, even if it’s just walking and not getting pizza one day a week type of thing. I see a lot of individuals in the line of work that I do. I am seeing a lot more individuals age 55 and up who are now Type II Diabetic. And it’s a lot of lifestyle – stuff they have control over and can change.”

Therefore, the men believed that providing information about modifiable behaviours would increase individuals’ motivation to adopt these behaviours.

**Self-Efficacy**

Since participants identified physical activity as a modifiable behaviour, they were asked to discuss the ease with which individuals can initiate and maintain physically active lifestyles. The men consistently acknowledged that while physical activity is beneficial, it is also a difficult behaviour to maintain. When asked about different techniques that could be used to increase their self-efficacy regarding performing regular physical activity, the men expressed the importance of planning. Participants indicated that presenting a weekly physical activity schedule was crucial to adopting a physically active lifestyle. Without following a physical activity schedule, some men indicated that
they were more likely to experience a lapse in their behaviours due to the lack of accountability.

“It’s too easy – when you don’t have a schedule, you don’t have another person depending on you, so you can say, ‘Oh, I’ll do that tomorrow’...and it turns into next year.”

The use of planning to increase men’s self-efficacy was also supported during the final two focus groups and four telephone interviews. During these discussions, participants were presented with a sample health message that included a list of physical activity ideas to promote the adoption of physical activity. Interestingly, the majority of the participants rejected the message. Providing a list of activities required the men to think about how they would incorporate these activities into their daily routines and this was considered to be too much work. Therefore, the participants discussed that messages presenting a list of physical activity ideas did not capture their attention or resonate.

“I think it’s way too idealistic because it’s asking you to change your life really. If you actually schedule something and say, ‘I’m going to go for a run at 9 o’clock every morning for half an hour’, you have it scheduled, you know you’re going to do it, and you go and do it. Whereas, this is counting on you to think about it throughout your entire day and make decisions to go out for 10 minutes and throw the ball around or I’m going to go for a walk at lunch. I mean some of these things like walking to work or biking to work, I think those are realistic, but just to say to somebody – be more active – but you know, on a busy day with a lot of priorities, I just don’t think it’s realistic unless you’re going to set aside the time to actually do it. I don’t know, it’s kind of like a feel-good
message like, ‘You can do it!’ but I don’t know if it’s realistic or will have an impact on the average person.”

As demonstrated in this excerpt, participants were opposed to health messages that only proposed activity ideas. Instead, they were in favour of messages that displayed a physical activity schedule as this reduced the work required by them to plan ahead. Subsequently, participants thought that they would be more confident to engage in regular physical activity when presented with a physical activity schedule.

“So, once you see that schedule in front of you, you tend to be more into it... you’re just more willing to follow that if something is put to you and this is what you’re going to do.”

Therefore, viewing a physical activity schedule provided the participants with motivation to try to incorporate the schedule into their weekly routines.

Emerging Themes from the Health Magazines and Advertisements

One of the underlying themes that emerged when the men looked through health magazines was the eye-catching nature of health advertisements that used sex appeal. When discussing their perceived health concerns, participants identified problems with sexual performance as a pertinent issue. Participants also conveyed that using sex appeal to capture men’s attention about a health issue is effective and should be used to stimulate men’s interest in a health message.

“It’s like sex though – it does really sell first off. It gets you interested and makes you look at the page.”
“If this is about men’s health, we were joking about it, but sex does sell. If I was trying to get men’s attention on a health issue, I think you know you should confront it. Why not use it because that’s how we’re going to get people’s attention.”

The participants believed that by framing a health message around sexuality and using sex appeal, the message would immediately capture men’s attention and have a more resonating impact than a message that did not target sexuality.

**Emerging Themes from the Sample Messages Based Upon the EPPM**

When evaluating the sample messages, participants were asked to compare high (#1) and low (#2) risk messages. It became evident that not only did the men find the high risk messages compelling due to local facts and statistics, but also due to the use of strong language. Participants felt that the direct language made the message content more believable and had a more resonating impact than other messages. As a result, the men perceived the high risk messages as more threatening than the low risk messages.

“Definitely the first message. And in that case, those statistics were more compelling than in the second one where there was a lot of ‘they might...’ – it was more general. Whereas, the other [first] one with the firm statistics was more compelling and more believable.”

Following the evaluation of the risk messages, participants also compared high efficacy (#3) and low efficacy (#4) messages. The men also were drawn to the specific and direct language that was used in the high efficacy messages. By incorporating strong language into the messages, participants believed that the messages were truly
demonstrating that physical activity is a viable behaviour that prevents and attenuates different health conditions.

“I liked message 3. It has more of a plan I guess. It has a nice schedule that you can follow and stuff and again it was more positive because it was like ‘physical activity can prevent…’ whereas message 4 was like ‘physical activity may prevent…’. I could be doing physical activity, but it may not be doing anything so what’s the point type of deal.”

“Yes, for sure – 100%. The explanation of it [message 3] makes it more serious I guess you could say. Whereas, you know, if there’s just a chance, ‘Oh yeah there’s a chance’, but you know, there’s a chance it might snow tomorrow, there’s a chance you know…it’s kind of more nonchalant.”

Therefore, the risk and efficacy messages were perceived to be compelling and captured the men’s interest when strong language was used. Participants thought that by using strong language, the message content became more specific and was believed to be true. Thus, the men paid more attention to the messages that incorporated more direct language than messages that used general language.

**Discussion**

The purpose of this study was to determine relevant and appealing health message content for men. The results from this study provide valuable insight into the utility of the EPPM as a suitable guiding framework to inform health message content for men. The results also provide information regarding message characteristics that are believed to be effective and encourage in depth processing of messages by a male audience. From
these study findings, we put forth recommendations to guide the content development of health messages and specifically physical activity messages for men.

The findings of this study suggest that the EPPM may be a useful framework for guiding the development of health messages for men. The men easily related to the four constructs of the EPPM and felt that these constructs were relevant to men and should be included in health messages. When presented with sample messages based upon the EPPM, participants provided positive feedback. For instance, consistent with the predictions of the EPPM, the majority of men indicated that they found the high risk and high efficacy messages more compelling than the low risk and low efficacy messages. Participants believed that these messages were more engaging and more likely to motivate them to begin to engage in health behaviours than other messages. Moving forward, a larger trial evaluating the impact of EPPM-based messages is now required.

Using the EPPM as a guide, a primary objective of this study was to determine men’s principal health concerns that they feel susceptible to and perceive to be serious. The health concerns identified by the participants were consistent with the concerns recognized in the Rural Men’s Health Promotion projects (Hall, 2003) and the current conditions that affect men worldwide (World Health Organization, 2010). The men also indicated that their sexual health was a primary concern. Erectile dysfunction is highly prevalent, but only 58% of affected men consult their physicians (Rosen et al., 2004). Evidently, there is a gap between men acknowledging the problem and seeking treatment. Thus, health messages that target sexual health may be warranted.

Health messages for men also should incorporate information addressing the threat constructs of the EPPM. Participants were interested in learning more about the
severity of and their potential susceptibility to these conditions. The men suggested that facts and statistics about the health threat could be incorporated into the message to provide information about the severity and susceptibility of different health conditions. Participants also expressed the idea that local facts and statistics are more impactful than generic facts and statistics. Indeed, research demonstrates that tailoring facts and statistics to the readers’ demographics increases the relevance of the information provided (Napolitano & Marcus, 2002; Noar, Benac, & Harris, 2007). Therefore, readers pay more attention to and process the message content in a more in depth manner (Cacioppo & Petty, 1984).

Participants also indicated that reputable sources were another important component to include in health messages. This finding is congruent with a meta-analysis by Kellar and Lehmann (2008), where readers perceived messages with reputable sources as more effective than messages with non-reputable sources or without sources. Therefore, by providing reputable sources, the message content may resonate more with the readers and they may become more motivated to engage in health behaviours.

However, when deciding whether to engage in a certain behaviour, men’s decisions are influenced by their perceived efficacy of the health behaviour. For example, participants were not interested in reading about health conditions that identified genetics as a primary risk factor since they felt they had little control over the prognosis of these illnesses. This finding contrasts with a qualitative study conducted with women who indicated that they become more vigilant and are more likely engage in preventative procedures and seek medical advice when they are aware of their family histories of chronic conditions (Meadows, Thurston, & Berenson, 2001). Evidently, men
and women may view and approach their health concerns differently and thus health messages should be gender-specific. By tailoring messages, health interventions may become more effective at encouraging adaptive behaviour change amongst men and women.

While participants were not interested in conditions associated with family history, they were interested in obtaining more information about modifiable lifestyle behaviours, such as physical activity. Participants believed that planning physical activity is a good strategy to use to enhance their self-efficacy regarding adopting and maintaining a physically active lifestyle. This finding highlights men’s awareness about the benefits of planning. Therefore, health messages should provide information about how to formulate effective and meaningful physical activity plans (Rhodes & Pfaeffli, 2010). As a result, men may be able to apply their knowledge about the benefits of physical activity planning and create their own successful plans.

Finally, one of our major findings was discovering that men are in favour of using sex appeal in health messages and advertisements. Research conducted with men and women in the advertising literature, although not specific to health advertisements, has indicated that sexual advertisements are more likely to be evaluated favorably and are more effective at catching readers’ attention and stimulating readers’ interest than non-sexual advertisements (Riechert, Heckler, & Jackson, 2001). However, sexual advertisements have been shown to elicit more peripheral processing than central processing (Riechert, Heckler, & Jackson, 2001). According to the Elaboration Likelihood Model (Cacioppo & Petty, 1984), peripheral processing elicited by sexual advertisements may not be sufficient to evoke long-term cognitive and behavioural
change amongst the readers. Severn, Belch, and Belch (1990) also discovered that while sexual advertisements do not detract readers’ brand recall, sexual advertisements may hinder product- and message-related processing. As a result, it is possible that incorporating sex appeal into health messages for men may interfere with the effects of the messages on men’s subsequent cognitive and behavioural changes. Finally, sexual advertisements have also been rated as more offensive than non-sexual advertisements (Severn, Belch, & Belch, 1990). Riechert, Heckler, and Jackson (2001) noted that sex appeal has been used in less explicit and offensive ways to attract readers’ attention, such as an American Cancer Society advertisement that shows a couple applying sunscreen in a suggestive manner with the message, “How to rub out skin cancer”. Therefore, if sex appeal is incorporated into health messages for men, it should be included with caution and used in a tactful way to not objectify and offend the readers.

Overall, this study has provided valuable insight into men’s current health concerns and with these findings, we may begin to create relevant and appealing health messages and resources for men. However, there are some areas of limitation. Convenience sampling was used and the majority of the participants were well-educated, Caucasian, and active. Therefore, our results may not be applicable to men in lower socioeconomic groups or who are inactive. Moreover, focus groups offer a collaborative and inviting environment that may influence participants’ responses (Powell & Single, 1996). Participants may have responded in ways that conformed to the group and may not be an accurate depiction of how they would have responded in an independent setting. Some of the focus groups and telephone interviews were conducted by a woman and the male participants may not have felt comfortable expressing their true opinions.
However, similar themes emerged from all focus groups and telephone interviews regardless of whether the moderator was male or female. Finally, this qualitative study is subject to inherent biases. Prior to conducting this research, the discussion moderators had personal opinions regarding what constitutes masculinity and how masculinity may influence men’s behaviours. Also, being a woman likely influenced the health conditions and preventative behaviours that the principal investigator (A.H.) believed to be significant for men. While the moderators tried to acknowledge their biases, these biases may have affected how the moderators directed the discussions.

According to these findings, we can begin to formulate preliminary recommendations regarding a theoretical framework and the content of health messages for men. Specifically, the EPPM should be tested as a message framework for men. Health messages for men should include risk information about health conditions that can be prevented by lifestyle behaviours. This risk information should be paired with reputable sources and conveyed through strong language and demographically tailored facts and statistics. Messages should also describe strategies such as planning to increase readers’ self-efficacy to perform the prescribed lifestyle behaviour. Finally, health messages for men may incorporate sex appeal to capture men’s attention and enhance the appeal of the messages. However, sex appeal should be included with caution since it may be perceived as offensive and may be unlikely to result in long-term behaviour change.
References


Chapter 4

From couch potato to iron man: Comparing the effectiveness of messages based upon the EPPM in relation to men’s physical activity behaviours.
Abstract

The majority of men are inactive. Men’s tendencies to participate in risky behaviours and their inactivity likely contribute to their increased risk of morbidity and mortality. Physical activity (PA) decreases the risk of developing many chronic conditions and may be an optimal behaviour to target in men’s health interventions. However, educational resources promoting PA for men are lacking. To address this gap, we tested the effectiveness of messages based upon the Extended Parallel Process Model (Witte, 1992) to increase men’s PA intentions and behaviours using a 2 (Risk) X 2 (Efficacy) experimental design. Men who were not meeting Canadian PA Guidelines (n=353) were randomly assigned to read high or low efficacy PA messages paired with high or no risk health information. Participants read four brief messages for four consecutive days. Intentions were assessed at baseline and the first follow-up (Day 5). Manipulation check measures were assessed at Day 5. PA behaviour was assessed at baseline and the second follow-up (Day 14). Men who received low efficacy and risk information were less likely to meet the PA Guidelines at Day 14 than men who only received low efficacy information. Providing risk information led to increases in PA behaviours. Intentions to be active were greater in the high efficacy group than the low efficacy group. Bivariate correlations between EPPM constructs indicated a disconnect between fear and efficacy perceptions, intentions, and defensive avoidance. From these results, we suggest preliminary recommendations for the development of PA messages for men and areas for future research.

**Key Words:** men, physical activity, messages, Extended Parallel Process Model
Introduction

Although men are more physically active than women, the majority is still inactive (Canadian Fitness and Lifestyle Research Institute, 2008). In Canada alone, 83% of men are not currently meeting the Canadian Physical Activity Guidelines (Colley et al., 2011). In addition to physical inactivity, men also engage in more risky behaviours and fewer health-promoting behaviours than women (Courtenay, 2003). This high rate of inactivity in combination with their other risky behaviours puts men at risk for numerous chronic conditions including cardiovascular disease, Type II Diabetes, and different types of cancer (Statistics Canada, 2010a). Because physical activity decreases the risk of developing many of these chronic conditions (Warburton, Katzmarzyk, Rhodes, & Shephard, 2007), it may be a viable solution to help men combat their increased risk of morbidity and mortality.

Despite widespread knowledge about the benefits of physical activity, there continues to be a lack of informational resources available to men that promote the adoption of physical activity and other health behaviours. For example, men receive less educational advice from their general practitioners about modifiable lifestyle behaviours that may decrease their health risks (Courtenay, 2000a). Men are aware of and concerned about the lack of educational resources for men (Coles et al., 2010). To address this gap, educational health resources specifically for men must be developed and disseminated.

Research testing the effectiveness of health messages is a crucial component of the development of these informational resources. Health messaging research has identified promising practices for promoting physical activity behaviours. For example, messages that are tailored to suit the characteristics of the message recipient have greater
potential for influencing physical activity related thoughts and behaviours than generic messages (Latimer, Brawley, & Bassett, 2010). It is important to note, however, that the majority of participants in physical activity messaging research are women (Latimer, Brawley, & Bassett, 2010). Therefore, men are underrepresented in this field of study and future research endeavours testing physical activity messages for men are warranted.

When deciding upon health behaviours to target in health promotion interventions and resources for men, gender norms may be a significant factor to take into account. For example, physical activity may be an appropriate health behaviour to target in health messages for men because performing physical activities such as sports allow men to display traits that are congruent with masculine gender roles including autonomy, dominance, strength, and competitiveness (Sloan, Gough, & Conner, 2010). Therefore, physical activity may be a behaviour that allows men to maintain rather than deconstruct their male gender role identities.

It has also been suggested that men’s conformity to gender roles may explain their excess of risky behaviours (Courtenay, 2000a). More specifically, men who strongly identify with a masculine gender role have low perceived vulnerability and do not believe their current behaviours are hazardous to their health (Courtenay, 2000a; 2000b; 2003). Risk perception is a predictor of individuals’ intentions and health behaviours (Brewer et al., 2007; Schwarzer, 2008). Therefore, using health messages to influence men’s risk perceptions may be a viable method to elicit adaptive behaviour change.

The Extended Parallel Process Model (EPPM; Witte, 1992) highlights risk perceptions as a central theoretical construct and thus may be an appropriate framework for guiding the development of health communication interventions for men. According
to the EPPM (Figure 1), once people read a message, they perform two appraisals that lead to one of three potential outcomes. Readers begin the first appraisal by characterizing the perceived severity (i.e. the seriousness of the threat) and their perceived susceptibility (i.e. their chances of experiencing the threat). If the perceived threat is low, individuals will not respond to the message. However, if the perceived threat is moderate or high, individuals will experience fear and begin the second appraisal.

**Figure 1.** The Extended Parallel Process Model (Witte, 1992).

During the second appraisal, readers characterize the perceived response efficacy (i.e. whether the suggested response effectively prevents the threat) and their perceived self-efficacy (i.e. whether they can successfully perform the recommended response). If both perceived threat and efficacy are high, readers will engage in danger control processes. In this scenario, readers accept the message and engage in protection motivation, such that they become motivated to form intentions and plans to adopt behaviours that will protect them from acquiring the described threat. Likewise, readers will engage in fear control processes if perceived efficacy is low. In this situation,
readers engage in defensive motivation and perform maladaptive coping strategies such as denying the threat and continuing to participate in risky behaviours.

The EPPM has been evaluated in the context of promoting condom use to prevent against the human papilloma virus (Witte, Berkowitz, Cameron, & McKeon, 1998), vitamin consumption to reduce homocysteine levels and risk of cardiovascular disease (McKay, Berkowitz, Blumberg, & Goldberg, 2004), and meningitis prevention (Gore & Bracken, 2005). Consistent with the predictions of the EPPM, individuals who received a high threat/high efficacy message were more likely to develop positive attitudes and intentions towards the targeted behaviour and to engage in the health behaviour than individuals who received other messages.

One EPPM-based study exclusively targeted men (Morman, 2000). This experiment evaluated EPPM-based messages promoting testicular self-examination (TSE). Consistent with predictions of the EPPM, men who received a high threat/high efficacy message were more likely to form intentions to perform TSEs than men who received a high threat/low efficacy message. Evidently, the EPPM appears to be a theoretical framework appropriate for guiding the content of health messages for men. However, no studies known to date have tested the EPPM in regards to physical activity messages targeted towards men.

To address this gap in the literature, the current study evaluated a series of physical activity messages for men based upon the tenets of the EPPM. From the findings of a previous qualitative investigation of health message content for men (Hatchell, Clarke, Kimura, & Latimer, in preparation), the messages used in this study targeted four types of health conditions associated with physical inactivity. The primary
objective of the current study was to determine the most efficacious combination of risk and efficacy information to encourage men to increase their physical activity levels in order to meet the Canadian Physical Activity Guidelines. We hypothesized that men who received messages with both risk and high efficacy information would be the most likely to increase their physical activity levels and meet the Canadian Physical Activity Guidelines at the two-week follow up whereas men who received messages with both risk and low efficacy information would be the least likely to increase their physical activity levels and meet the Canadian Physical Activity Guidelines.

Our secondary objective was to examine message effects on participants’ intentions to be physically active. We hypothesized that men who received messages with both risk and high efficacy information would have greater intentions to be active than men who received both risk and low efficacy information.

We also examined the relationships between the constructs of the EPPM in relation to men’s physical activity behaviours. Therefore, we predicted that (a) increased perceptions of susceptibility and severity would be associated with more fear, (b) lower levels of task and scheduling self-efficacy and response efficacy would be associated with greater fear, and (c) higher levels of defensive avoidance would be associated with lower levels of physical activity participation. Meanwhile, in regards to intentions immediately after reading the four messages and physical activity behaviour at the two-week follow up, greater fear would be related to greater intentions and higher levels of physical activity participation.
Method

Participants

Nine hundred fifty men were recruited through online advertising (e.g. www.facebook.com), contacts at local businesses and organizations, and face-to-face recruitment at different commercial locations in Ontario, Canada. After providing their consent to participate in the study, 938 men completed the eligibility survey. Participants were deemed to be eligible if they were male, physically able to participate in physical activity, and had not been meeting the Canadian Physical Activity Guidelines (e.g. 150 minutes of moderate- to vigorous-intensity aerobic activities per week and muscle strengthening activities two days per week) for at least two months. Participants were also excluded if they did not consent to providing their e-mail addresses as this was our only method of correspondence with the participants. Finally, participants who did not live in the Southeastern Ontario region (e.g. Belleville, Kingston, Ottawa and surrounding areas), the Greater Toronto Area, Halifax and surrounding areas, and Vancouver and surrounding areas were to be excluded. However, recruitment was tailored to specific geographic locations and no participants were excluded for this reason. Following the completion of the eligibility survey, 611 men were randomized into one of the four message conditions.

Study Design

To test the hypotheses of this study, a 2 (Risk) x 2 (Efficacy) randomized experimental design was used (Figure 2).
Figure 2. CONSORT flow chart.
Participants completed measures at five time points: (a) Eligibility screening (Day 1): participants provided their e-mail addresses, self-reported their sex and physical ability to perform physical activity, and classified their physical activity levels into one of six categories; (b) Baseline prior to reading any messages (Day 1): participants reported their intentions and physical activity behaviours; (c) Immediately after reading each message (Day 1-4): participants rated their fear and defensive avoidance; (d) Day 5 after reading all of the messages: participants recorded their message recall, message preference, masculinity, perceived credibility, severity, susceptibility, response efficacy, task and scheduling self-efficacy, and intentions; and (e) Day 14: participants reported their physical activity levels.

**Demographic and Screening Measures**

*Eligibility Questionnaire.* Participants indicated whether they were male or female and whether they had their doctors’ permission to engage in physical activity. Participants also were provided with the Canadian Physical Activity Guidelines (Appendix F) and classified their physical activity levels into one of the following categories: (a) Yes, I have been doing the recommended amount of exercise every week for more than 2 months; (b) No, I am not doing the recommended amount of exercise every week but I do exercise and I do not intend to make any changes to my weekly exercise in the next 2 months; (c) No, I am not doing the recommended amount of exercise every week but I do exercise and I intend to start increasing my weekly exercise in the next 2 months; (d) No, I am not doing any exercise but I intend to begin doing exercise in the next 2 months; (e) No, I am not doing the recommended amount of
exercise and I do not intend to increase my exercise in the next 2 months; and (f) None of these statements describe me (adapted from Blissmer & McAuley, 2002).

*Demographics.* Participants indicated their age, ethnicity, level of education, marital status, and city of residence.

*Outcome Measures*

*Physical Activity Behaviour.* To assess physical activity behaviour, an adapted short-form International Physical Activity Questionnaire (International Physical Activity Questionnaire, 2010) was administered. Participants recorded the number of days in the last seven days and the number of minutes on each of those days that they participated in muscle strengthening activities, moderate-intensity aerobic activities, and vigorous-intensity aerobic activities. From these data, the total minutes performing each type of activity per week were tallied. Finally, the total number of physical activity minutes performed per week was calculated from the sum of the total minutes performing each of the three activities per week. Participants were classified as meeting the Canadian Physical Activity Guidelines if they performed at least 150 minutes of moderate- to vigorous-intensity aerobic activities per week and performed muscle strengthening activities at least two days per week. The short-form IPAQ has been shown to be reliable measure of physical activity with a pooled Spearman’s correlation of .76 (Craig et al., 2003). Agreement between the short-form IPAQ and physical activity behaviour measured with an accelerometer was found to be fair with a Spearman’s correlation of .30 (Craig et al., 2003).
**Intentions.** To assess participants’ intentions to engage in physical activity, two items adapted from Rhodes and Courneya (2004) were used. Participants indicated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) their willingness and intentions to engage in the recommended amount of physical activity in the next two weeks. The two items were highly correlated at baseline and the first follow-up in the current study (r > .86).

**Message Manipulation Check Measures**

*Message Recall.* To assess whether participants read the messages, they were asked to list the key message points they remembered from all of the messages. Participants’ responses were scored on a 3-point scale by the principal investigator (A.H.) and a research assistant, where (a) no points were awarded if participants left the field blank or did not recall the message content; (b) one point was awarded if participants recalled key points that were not directly related to the themes of the messages; and (c) two points were awarded if participants recalled key points that were directly related to the themes of the messages. The inter-rater reliability for the two raters was found to be Kappa = .93 (p<.001).

*Message Appeal.* To assess message appeal, participants selected their most and least favorite messages from the four health messages they read.

**Theory-Based Manipulation Check Measures**

*Fear.* To assess participants’ fear arousal, a 3-item measure adapted from Witte, Berkowitz, Cameron, and McKeon (1998) was used. Participants rated whether they
were frightened, scared, and anxious on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). In previous work, this measure has demonstrated sensitivity to differences in messages with high and low threat content (Cho, 2003) and high and low efficacy content (McKay, Berkowitz, Blumberg, & Goldberg, 2004). This measure has demonstrated adequate reliability previously (Cronbach’s $\alpha = .84$; Witte, Berkowitz, Cameron, & McKeon, 1998; Nunnally, 1988). The Cronbach’s alphas in the current study were greater than .92.

**Defensive Avoidance.** To assess whether participants possessed a motivated resistance to the messages and were engaging in fear control processes, a 2-item measure adapted from Witte, Berkowitz, Cameron, and McKeon (1998) was used. Participants indicated whether or not they wanted to think about the targeted health condition and do something to prevent the development of the targeted health condition. This measure has demonstrated some sensitivity to differences in fear appeal messages (McKay, Berkowitz, Blumberg, & Goldberg, 2004). The two items were significantly correlated with each other for the four targeted health conditions ($r = .19$ to .41)

**Perceived Severity.** To assess participants’ perceived severity of the targeted health conditions, four items adapted from the Risk Behavior Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996) were used. Participants rated their perceived severity of erectile dysfunction, cardiovascular disease and Type II diabetes, obesity, and problems with sexual performance on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). This measure has demonstrated sensitivity to differences between messages with high and low threat content (Cho, 2003) and high and low efficacy content (McKay, Berkowitz, Blumberg, & Goldberg, 2004). This measure has demonstrated
good reliability previously (Cronbach’s $\alpha = .92$; Cho, 2003; Nunnally, 1988). The Cronbach’s alpha in the current study was .81.

*Perceived Susceptibility.* To assess participants’ perceived susceptibility of the targeted health conditions, four items adapted from the Risk Behavior Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996) were used. Using a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), participants assessed their risk for developing erectile dysfunction, cardiovascular disease and Type II Diabetes, obesity, and problems with sexual performance. In previous work, this measure has demonstrated sensitivity to differences between messages with high and low threat content (Cho, 2003) and high and low efficacy content (McKay, Berkowitz, Blumberg, & Goldberg, 2004). This measure has demonstrated adequate reliability previously (Cronbach’s $\alpha = .85$; Cho, 2003; Nunnally, 1988). The Cronbach’s alpha in the current study was .87.

*Task and Scheduling Self-Efficacy.* To assess participants’ task self-efficacy, three items adapted from Rhodes, Blanchard, and Hunt Matheson (2006) were used. Participants indicated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) whether they were physically able to, had the physical ability to, and could easily engage in the recommended amount of physical activity. This measure has demonstrated good reliability previously (Cronbach’s $\alpha = .75$; Rhodes, Blanchard, & Hunt Matheson, 2006; Nunnally, 1988). The Cronbach’s alpha in the current study was .88.

To assess participants’ scheduling self-efficacy, three items adapted from DuCharme and Brawley (1995) were used. Participants indicated on a scale from 0% (not at all confident) to 100% (completely confident) whether they were confident in their abilities to reach, plan, and arrange their schedules to meet the recommended amount of
physical activity each week. This measure has demonstrated good reliability previously (Cronbach’s α = .85 to .89; Dawson & Brawley, 2000; Nunnally, 1988). The Cronbach’s alpha in the current study was .93.

**Response Efficacy.** To assess participants’ beliefs of whether physical activity is effective at preventing the occurrence of the targeted health conditions, four items adapted from the Risk Behavior Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996) were used. Participants indicated whether they believed physical activity would decrease their risk of developing erectile dysfunction, cardiovascular disease and Type II Diabetes, obesity, and problems with sexual performance on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). This measure has demonstrated sensitivity to differences between messages with high and low threat and efficacy content (McKay, Berkowitz, Blumberg, & Goldberg, 2004). This measure has demonstrated adequate reliability previously (Cronbach’s α = .92; Cho, 2003; Nunnally, 1988). The Cronbach’s alpha in the current study was .92.

**Perceived Credibility.** A 3-item measure adapted from Witte, Berkowitz, Cameron, and McKeon (1998) was used to assess the participants’ evaluation of the provided messages and whether the participants were engaging in fear control processes. Using a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), participants rated whether they believed the messages were manipulative, misleading, or distorted. This measure has previously revealed sensitivity to differences in fear appeal messages (McKay, Berkowitz, Blumberg, & Goldberg, 2004). This measure has demonstrated adequate reliability previously (Cronbach’s α = .96 to .97; Witte, Berkowitz, Cameron, & McKeon, 1998; Nunnally, 1988). The Cronbach’s alpha in the current study was .88.
Masculinity

To assess how strongly participants identify with the traditional male gender role, a 19-item measure adapted from Thompson and Pleck’s Male Role Norms Scale (1986) was used. Using a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), participants rated their agreement with traditional male status norms and toughness norms. This measure has demonstrated reliability previously (Cronbach’s α = .90, Morman, 2000). The Cronbach’s alpha in the current study was .90.

Message Development

The messages used in the current study were informed by a qualitative investigation of men’s health concerns (Hatchell, Clarke, Kimura, & Latimer, in preparation). In a series of four focus groups and four telephone interviews, participants discussed their perceptions of unhealthy behaviours and the top five health concerns of men. Participants reviewed health magazines and identified which health advertisements they found appealing. The initial two focus groups also discussed the relevance of the four EPPM constructs to health messages and health advertisements. The responses from these discussions were used to inform and develop four messages that each focused on a different health threat and were based upon the tenets of the EPPM. Each message had four different variations of information, including high risk and high efficacy, high risk and low efficacy, low risk and high efficacy, and low risk and low efficacy. These messages were subsequently pilot tested in the remaining two focus groups and four telephone interviews. During these pilot tests, participants read and provided feedback about the content of the sample risk (high/low) and efficacy (high/low) messages and
about how well these messages addressed the four key constructs of the EPPM. These messages were also reviewed by staff members from a local public health unit.

**Message Content**

Following the pilot tests of the messages, the content of the messages was revised for the current study. Four base high risk and high efficacy messages were created. Each message focused on one major health concern for men and included, (a) Message 1: erectile dysfunction, (b) Message 2: chronic conditions including cardiovascular disease and Type II Diabetes, (c) Message 3: overweight and obesity, and (d) Message 4: problems with sexual performance. The risk messages pertaining to erectile dysfunction only focused on the risk factors and consequences of this specific sexual dysfunction. Meanwhile, the risk messages describing sexual performance focused on more general topics relating to sexual health, including libido, sexual desire, and sexual satisfaction.

Consistent with the recommendations from our pilot study, the high risk base messages presented risk information by accentuating local facts and statistics. Also consistent with the recommendations from our pilot study, we tailored the facts and statistics presented. The participants’ cities of residence were collected and used to tailor the message content to the geographic locations of the participants, including the Southeastern Ontario region including Belleville, Kingston, Ottawa, and the surrounding areas, the Greater Toronto Area, Halifax and the surrounding areas, and Vancouver and the surrounding areas. For example, men in Southeastern Ontario who were provided with a high risk message about obesity were informed that up to two of three men in that region were overweight or obese. Meanwhile, men in the Greater Toronto Area were
informed that up to three of five men in that region were overweight or obese. Tailoring information enhances message relevance which may lead to more in depth information processing (Cacioppo & Petty, 1984; Napolitano & Marcus, 2002; Noar, Benac, & Harris, 2007).

In the base messages, efficacy information also was provided for each of the four health conditions. The messages provided the Canadian Physical Activity Guidelines (Canadian Society for Exercise Physiology, 2011) and discussed the effectiveness of physical activity for decreasing the risk of the targeted health conditions. The high efficacy messages also highlighted the physiological mechanisms by which physical activity is an effective preventative measure against the targeted health conditions. As well, an example physical activity plan was provided in each of the high efficacy messages to demonstrate how physical activity can be incorporated into a daily routine. A different plan was presented for each targeted health condition. The high efficacy messages also included information about and tailored examples of four different types of physical activity – moderate- and vigorous-intensity aerobic activities and upper and lower body muscle strengthening activities.

Using the high risk/high efficacy message as a base, three other versions of each message were created. The no risk/high efficacy message only provided high efficacy information as outlined above. The high risk/low efficacy message provided tailored risk information and also provided the Canadian Physical Activity Guidelines with some information about the benefits of physical activity. Ambivalent language was used and generic lists and examples of the four types of physical activity were included in the low efficacy information and no physical activity plans were provided. Finally, the no
risk/low efficacy message only provided low efficacy information as outlined above.

Please refer to Table 1 for an outline of the message content. The full messages are included in Appendix K.

Table 1. The message delivery schedule.

<table>
<thead>
<tr>
<th>Message Delivery</th>
<th>Risk Messages</th>
<th>Efficacy Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Erectile Dysfunction</td>
<td>Physical Activity Response,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate-Intensity Aerobic Activities, and General Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Activity Response and Moderate-Intensity Aerobic Activities</td>
</tr>
<tr>
<td>Day 2</td>
<td>Cardiovascular Disease and Type II Diabetes</td>
<td>Physical Activity Response, Vigorous-Intensity Aerobic Activities, and Gym Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Activity Response and Vigorous-Intensity Aerobic Activities</td>
</tr>
<tr>
<td>Day 3</td>
<td>Overweight and Obesity</td>
<td>Physical Activity Response, Upper Body Strength Training Activities, and Sports Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Activity Response and Upper Body Strength Training Activities</td>
</tr>
<tr>
<td>Day 4</td>
<td>Sexual Performance</td>
<td>Physical Activity, Lower Body Strength Training Activities, Response and Home Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical Activity Response and Lower Body Strength Training Activities</td>
</tr>
</tbody>
</table>

Procedure

The entire study was completed online via StudentVoice, an online interface for distributing and managing questionnaires. Once participants consented to participate in the study, they completed an eligibility questionnaire. Eligible participants were randomly assigned into one of the four message conditions (high risk/high efficacy, high risk/low efficacy, no risk/high efficacy, and no risk/low efficacy through random page order. The participants completed the baseline questionnaire and then read the first health message (Day 1). After completing the baseline questionnaire and reading the first health message, the participants received an e-mail each day for three consecutive days (Day 2, 3, 4). Each e-mail invited the participants to read a new health message (Table
After reading each message, the participants were prompted to answer the fear and defensive avoidance measures.

Following the completion of the four day message cycle, participants completed follow-up questionnaires one day after reading the fourth message (Day 5) and two weeks after baseline (Day 14). Finally, participants were debriefed and each participant was provided with a high efficacy message about physical activity as previous research has indicated that low efficacy messages tend to deter readers from engaging in the prescribed behaviour (Witte, 1992; McKay, Berkowitz, Blumberg, & Goldberg, 2005; Morman, 2000). The participants were also provided with a URL link to view the new Canadian Physical Activity Guidelines that were released in January 2011 (Appendix F).

To encourage enrolment and continued participation in the study, we had a comprehensive compensation scheme. Participants received a ballot after completing the baseline questionnaire and after reading each of the four messages, for a total of up to five ballots. These ballots entered participants into a draw to win one of four $500 gift cards to local home improvement centers. The participants also received up to $15 in gift cards to local vendors for completing the follow-up questionnaires at Day 5 ($10) and Day 14 ($5).

**Data Analyses**

*Data Treatment.* The IPAQ data were treated according to steps prescribed in the IPAQ scoring manual (International Physical Activity Questionnaire, 2005). Time variables exceeding 180 minutes for moderate- and vigorous-intensity aerobic activities per day were recoded to 180 minutes. Following this treatment, the physical activity data
were positively skewed. Therefore, all physical activity data were submitted to a logarithmic transformation to ensure a normal distribution of data.

Statistical Analyses. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS version 19.0, Chicago, IL). Analyses of variance (ANCOVA) for continuous data and chi-squared analyses for categorical data were conducted to ensure effective randomization and to perform manipulation checks. Frequencies and descriptive statistics were calculated to examine participant demographic characteristics.

To test our primary hypotheses, we first conducted a logistic regression to examine the effects of the messages on whether or not participants were meeting the Physical Activity Guidelines at Day 14. In this logistic regression model, the covariates from Day 5 including masculinity, task and scheduling self-efficacy and response efficacy as well as whether participants were meeting the Physical Activity Guidelines at baseline were entered in the first step. Masculinity was entered into the model as a covariate because we hypothesized it would influence men’s responses to the health messages based upon previous literature (Courtenay 2000a; 2000b; 2003). Masculinity was not included as a moderator due to inadequate sample size. The three efficacy constructs were entered into the model as covariates because Cho (2003) demonstrated that individuals’ inherent efficacy perceptions of a health behaviour may influence their responses to a risk-based health message. Finally, the main effects for risk information and efficacy information were then each entered separately into the model followed by their interaction (Risk Information X Efficacy Information). A restructured logistic regression equation to test the simple effects for each efficacy information condition was
conducted to provide an interpretation of the significant Risk Information X Efficacy Information interaction.

We then conducted repeated measures analyses of covariance (RM-ANCOVA) to determine if physical activity behaviour and intentions increased over time and whether this increase in behaviour and intentions differed between groups. In separate models, log-transformed total physical activity minutes per week at baseline and Day 14 and intentions at baseline and Day 5 were entered as the dependent variables while risk information and efficacy information were entered as the independent variables. Finally, the masculinity and efficacy covariates were entered into the model. When significant interactions were found, follow-up ANCOVAs and Bonferroni-adjusted post hoc tests were performed to identify which groups were significantly different.

Where applicable, eta squared and Cohen’s $d$ were calculated to determine effect sizes. Eta squared effect sizes were classified as small ($\eta_p^2=.0099$), medium ($\eta_p^2=.0588$), or large ($\eta_p^2=.1379$; Cohen, 1988), while Cohen’s $d$ effect sizes were classified as small ($d=.20$), medium ($d=.50$), or large ($d=.80$; Cohen, 1992).

Finally, to test our tertiary hypotheses and determine the relationships between threat, efficacy, intentions, physical activity behaviour, fear, and defensive avoidance variables, we conducted bivariate correlations.
Results

Participants

Study Attrition

As outlined in Figure 2, in total 199 men were lost to follow-up due to drop out after completing the baseline questionnaire. There were no differences amongst the men who dropped out and who completed the study in terms of experimental condition, age, ethnicity, or marital status (p>0.05). However, more men who dropped out had a high school (11.1%) or college diploma (41.7%) than men who completed the entire study, \( \chi^2 (4, n=552)=17.83, p=0.001 \). Fewer men who dropped out had a post-bachelor level degree (e.g. Master’s, Doctorate; 13.1%) than the men who completed the entire study, \( \chi^2 (4, n=552)=17.83, p=0.001 \). Finally, men who dropped out of the study recorded lower levels of physical activity at baseline (\( M_{\text{mins}} = 195.22 \pm 265.41 \)) than men who completed the study (\( M_{\text{mins}} = 197.73 \pm 265.42 \)), \( F(1, 495)=5.00, p=0.026 \).

Baseline Characteristics

A convenience sample of 353 men (\( M_{\text{age}} = 35 \pm 6.5 \) years) completed the entire study. There were no significant differences in demographic characteristics (Table 2) between the four experimental groups at baseline (p>0.05). From the participants who completed the baseline questionnaire, the majority were Caucasian (83.8%) and had a common-law or married spouse (57.2%). Most participants had pursued post-secondary education with 36.2% of participants having either partially or entirely completed a college diploma and 54.0% of participants having either partially or entirely completed a
university degree (e.g., Bachelor’s, Master’s, Doctorate etc.). At baseline, there were no differences in participants’ physical activity levels between the four different groups, $F(3, 493)=0.243, p=0.867$. Participants performed muscle strengthening activities on 1.37 (SD = 1.73) days per week. Participants also performed 129.7 minutes (SD = 190.7 minutes) of moderate- to vigorous-intensity aerobic activities per week.
Table 2. Demographic characteristics by experimental group for men who completed the entire study.

<table>
<thead>
<tr>
<th></th>
<th>High Risk &amp; High Efficacy (n = 106)</th>
<th>High Risk &amp; Low Efficacy (n = 85)</th>
<th>No Risk &amp; High Efficacy (n = 77)</th>
<th>No Risk &amp; Low Efficacy (n = 85)</th>
<th>Total (n = 353)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years (M ± SD)</td>
<td>34.63 ± 6.37</td>
<td>35.41 ± 7.00</td>
<td>34.38 ± 6.45</td>
<td>35.07 ± 6.47</td>
<td>34.87 ± 6.55</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>88.7%</td>
<td>84.7%</td>
<td>82.9%</td>
<td>87.1%</td>
<td>86.1%</td>
</tr>
<tr>
<td>Minority</td>
<td>11.3%</td>
<td>15.3%</td>
<td>17.1%</td>
<td>12.0%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School or High School Diploma</td>
<td>8.5%</td>
<td>3.5%</td>
<td>6.5%</td>
<td>9.4%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Some College or College Diploma</td>
<td>39.6%</td>
<td>32.9%</td>
<td>31.2%</td>
<td>27.1%</td>
<td>33.1%</td>
</tr>
<tr>
<td>Some University or Bachelor-Level Degree</td>
<td>29.2%</td>
<td>40.0%</td>
<td>44.2%</td>
<td>36.5%</td>
<td>36.8%</td>
</tr>
<tr>
<td>Post-Bachelor Degree (e.g. MA, MSc, PhD) or Other</td>
<td>22.6%</td>
<td>23.5%</td>
<td>18.2%</td>
<td>27.1%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>34.9%</td>
<td>37.6%</td>
<td>33.8%</td>
<td>30.6%</td>
<td>34.3%</td>
</tr>
<tr>
<td>Common Law or Married</td>
<td>60.4%</td>
<td>52.9%</td>
<td>58.4%</td>
<td>56.5%</td>
<td>57.2%</td>
</tr>
<tr>
<td>Divorced</td>
<td>2.8%</td>
<td>4.7%</td>
<td>1.3%</td>
<td>9.4%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Other</td>
<td>1.9%</td>
<td>4.7%</td>
<td>6.5%</td>
<td>3.5%</td>
<td>4.0%</td>
</tr>
</tbody>
</table>
Manipulation Check

Message Recall

The majority of men were able to recall the key points of the messages (95.75%). Meanwhile, some participants either recorded key points that were not directly related to the themes of the messages (2.27%) or did not recall the message content (1.98%).

Perceived Credibility

A univariate ANCOVA with perceived credibility as the dependent variable and risk information and efficacy information as the independent variables was conducted to confirm whether participants’ perceived credibility of the message content differed depending on the message type. Masculinity was also included as a covariate in the model and was found to be significant, $F(1, 348)=6.34$, $p=0.012$. No significant main effects or interactions were found.

Message Preference

The most preferred message discussed sexual performance (34.84%), followed by messages that discussed chronic diseases including cardiovascular disease and Type II Diabetes (28.05%) and overweight and obesity (26.63%). The least preferred message discussed erectile dysfunction (10.48%).

Three chi-square analyses were conducted to determine whether (a) receiving risk information, (b) receiving efficacy information, or (c) condition which accounted for the four different combinations of risk and efficacy information (high risk/high efficacy, high risk/low efficacy, no risk/high efficacy, and no risk/low efficacy) influenced participants’ preferred message choice. A significant effect for risk information was discovered,
\( \chi^2 (3, \ n=353)=8.91, \ p=0.030. \) Participants were more likely to prefer the chronic conditions message when they received risk information rather than when they did not receive risk information. No significant effects for efficacy information or condition were found.

*Risk and Efficacy Perceptions*

To determine whether the messages affected risk perceptions, a multivariate ANCOVA (MANCOVA) was conducted with perceived severity and susceptibility as the dependent variables and risk information and efficacy information as the independent variables. Masculinity was included as a covariate in the model and was found to be significant, \( F(2, 347)=7.19, \ p=0.001. \) No significant effects were found (refer to Tables 3, 4, and 5). A MANCOVA with task self-efficacy, scheduling self-efficacy, and response efficacy as the dependent variables and risk information and efficacy information as the independent variables also was not significant (refer to Tables 3, 4, and 5). Masculinity was not a significant covariate in this model.

*Fear Perceptions and Defensive Avoidance*

A MANCOVA was conducted with perceived fear for each of the four health conditions as the dependent variables and risk information and efficacy information as the independent variables to confirm whether the messages affected participants’ perceived fear of the health conditions described in the messages. Masculinity was included as a covariate in the model and was found to be significant, \( F(4, 345)=4.65, \ p=0.001. \) A main effect for risk information was found, \( F(4, 345)=5.32, \ p<0.001, \) Pillai’s Trace=0.058, \( \eta_p^2=0.058. \) Follow-up ANCOVAs revealed significant between-group effects on participants’ fear of erectile dysfunction \( (F(1, 348)=4.82, \ p=0.028) \) and obesity
Participants who received risk information about erectile dysfunction were less likely to experience fear than participants who did not receive risk information ($d=-.24$; Table 6). Participants who received risk information about obesity were more likely to experience fear than participants who did not receive risk information ($d=.34$; Table 6). No main effects for efficacy information were found (refer to Table 7).

A significant interaction between risk information and efficacy information was also found, $F(4, 345)=4.31$, $p=0.002$, Pillai’s Trace=0.048, $\eta^2_p=.048$. Follow-up ANCOVAs revealed significant between-group effects on the participants’ fear of chronic conditions, $F(1, 348)=5.09$, $p=0.025$, $\eta^2_p=.014$. Subsequent Bonferroni pairwise comparisons across the four conditions indicated that participants who received risk information paired with low efficacy information were more likely to experience fear about the two chronic conditions than participants who only received low efficacy information ($p=0.088$, $d=.40$; Table 8).

A MANCOVA was conducted with defensive avoidance towards each of the four health conditions as the dependent variables and risk information and efficacy information as the independent variables to confirm whether the different messages affected participants’ defensive avoidance towards the message content. Masculinity was included as a covariate in the model and was found to be significant, $F(4, 345)=2.74$, $p=0.029$. No significant main effects or interactions were found (refer to Tables 6, 7, and 8).
Table 3. Means for intentions, physical activity behaviour, threat and efficacy constructs, and perceived credibility by risk information.

<table>
<thead>
<tr>
<th>Range</th>
<th>Baseline (Day 1)</th>
<th>Day 5</th>
<th>Day 14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Risk Information</td>
<td>High Risk Information</td>
<td>No Risk Information</td>
</tr>
<tr>
<td>Total Physical Activity Min/Wk (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>221.59 (235.33)</td>
<td>178.41 (237.94)</td>
<td>236.11 (328.89)</td>
</tr>
<tr>
<td>Intentions (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.01 (3.03)</td>
<td>8.84 (3.04)</td>
<td>10.35 (2.34)</td>
</tr>
<tr>
<td>Task Self-Efficacy (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17.50 (3.79)</td>
<td>17.34 (3.81)</td>
<td></td>
</tr>
<tr>
<td>Scheduling Self-Efficacy (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>20.75 (8.44)</td>
<td>20.10 (8.49)</td>
<td></td>
</tr>
<tr>
<td>Response Efficacy (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>24.21 (4.67)</td>
<td>23.76 (4.70)</td>
<td></td>
</tr>
<tr>
<td>Perceived Severity (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.48 (4.16)</td>
<td>23.41 (4.17)</td>
<td></td>
</tr>
<tr>
<td>Perceived Susceptibility (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.49 (6.45)</td>
<td>15.70 (6.48)</td>
<td></td>
</tr>
<tr>
<td>Perceived Credibility (SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>7.39 (4.03)</td>
<td>7.20 (4.05)</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p<.05. <sup>a</sup>Means were adjusted for the masculinity covariate. <sup>b</sup>Means were adjusted for efficacy covariates.
Table 4. Means for intentions, physical activity behaviour, threat and efficacy constructs, and perceived credibility by efficacy information.

<table>
<thead>
<tr>
<th>Range</th>
<th>Baseline (Day 1)</th>
<th>Day 5</th>
<th>Day 14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Efficacy Info</td>
<td>High Efficacy Info</td>
<td>Low Efficacy Info</td>
</tr>
<tr>
<td>Total Physical Activity Min/Wk (SD)(^a,b)</td>
<td>-</td>
<td>199.90 (235.32)</td>
<td>200.09 (241.12)</td>
</tr>
<tr>
<td>Intentions (SD)(^a,b)</td>
<td>0-14</td>
<td>8.61 (3.03)</td>
<td>9.25 (3.06)</td>
</tr>
<tr>
<td>Task Self-Efficacy (SD)(^a)</td>
<td>0-21</td>
<td></td>
<td>17.72 (2.65)</td>
</tr>
<tr>
<td>Scheduling Self-Efficacy (SD)(^a)</td>
<td>0-30</td>
<td></td>
<td>20.63 (8.44)</td>
</tr>
<tr>
<td>Response Efficacy (SD)(^a)</td>
<td>0-28</td>
<td></td>
<td>23.94 (4.67)</td>
</tr>
<tr>
<td>Perceived Severity (SD)(^a)</td>
<td>0-28</td>
<td></td>
<td>23.79 (4.15)</td>
</tr>
<tr>
<td>Perceived Susceptibility (SD)(^a)</td>
<td>0-28</td>
<td></td>
<td>16.03 (6.44)</td>
</tr>
<tr>
<td>Perceived Credibility (SD)(^a)</td>
<td>0-21</td>
<td></td>
<td>7.41 (4.03)</td>
</tr>
</tbody>
</table>

Note. \(^a\)Means were adjusted for the masculinity covariate. \(^b\)Means were adjusted for efficacy covariates.
Table 5. Percentage of participants meeting the Canadian Physical Activity Guidelines and means for intentions, physical activity behaviour, risk and efficacy constructs, and perceived credibility by experimental group.

<table>
<thead>
<tr>
<th>Range</th>
<th>Baseline (Day 1)</th>
<th>Day 5</th>
<th>Day 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants Meeting CPAG (%)</td>
<td>-</td>
<td>13.2</td>
<td>14.1</td>
</tr>
<tr>
<td>Total Physical Activity Min/Wk (SD)</td>
<td>-</td>
<td>199.21 (243.56)</td>
<td>157.60 (232.49)</td>
</tr>
<tr>
<td>Intentions (SD)a,b</td>
<td>0-14</td>
<td>9.14 (3.04)</td>
<td>8.55 (3.02)</td>
</tr>
<tr>
<td>Task Self-Efficacy (SD)a</td>
<td>0-21</td>
<td>16.84 (4.07)</td>
<td>17.84 (3.51)</td>
</tr>
<tr>
<td>Scheduling Self-Efficacy (SD)a</td>
<td>0-30</td>
<td>19.58 (8.34)</td>
<td>20.62 (9.09)</td>
</tr>
<tr>
<td>Response Efficacy (SD)a</td>
<td>0-28</td>
<td>23.25 (5.25)</td>
<td>24.26 (3.52)</td>
</tr>
<tr>
<td>Perceived Severity (SD)a</td>
<td>0-28</td>
<td>23.11 (4.47)</td>
<td>23.71 (3.93)</td>
</tr>
<tr>
<td>Perceived Susceptibility (SD)a</td>
<td>0-28</td>
<td>15.29 (6.26)</td>
<td>16.08 (6.34)</td>
</tr>
<tr>
<td>Perceived Credibility (SD)a</td>
<td>0-21</td>
<td>7.20 (4.04)</td>
<td>7.21 (4.03)</td>
</tr>
</tbody>
</table>

Note. aMeans were adjusted for the masculinity covariate. bMeans were adjusted for efficacy covariates. CPAG = Canadian Physical Activity Guidelines, High Risk/High Efficacy = HR-HE, High Risk/Low Efficacy = HR-LE, No Risk/High Efficacy = NR-HE, and No Risk/Low Efficacy = NR-LE.
Table 6. Means for fear and defensive avoidance related to the four targeted health conditions by risk information.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>No Risk Information</th>
<th>High Risk Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>0-21</td>
<td>8.66 (4.84)</td>
<td>7.52 (4.86)*</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>0-21</td>
<td>9.83 (4.38)</td>
<td>10.52 (4.39)</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>0-21</td>
<td>8.40 (4.71)</td>
<td>10.02 (4.73)*</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>0-21</td>
<td>9.35 (4.77)</td>
<td>10.06 (4.82)</td>
</tr>
<tr>
<td>Defensive Avoidance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>0-4</td>
<td>2.63 (.67)</td>
<td>2.62 (.68)</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>0-4</td>
<td>2.43 (.60)</td>
<td>2.37 (.59)</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>0-4</td>
<td>2.40 (.65)</td>
<td>2.40 (.66)</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>0-4</td>
<td>2.48 (.65)</td>
<td>2.46 (.66)</td>
</tr>
</tbody>
</table>

Note. *p<.05. All means were adjusted for the masculinity covariate.

Table 7. Means for fear and defensive avoidance related to the four targeted health conditions by efficacy information.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Low Efficacy Information</th>
<th>High Efficacy Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>0-21</td>
<td>8.15 (4.82)</td>
<td>8.03 (4.90)</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>0-21</td>
<td>10.17 (4.37)</td>
<td>10.18 (4.42)</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>0-21</td>
<td>9.70 (4.69)</td>
<td>8.72 (4.76)</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>0-21</td>
<td>10.27 (4.77)</td>
<td>9.14 (4.83)</td>
</tr>
<tr>
<td>Defensive Avoidance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>0-4</td>
<td>2.61 (.66)</td>
<td>2.64 (.68)</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>0-4</td>
<td>2.41 (.60)</td>
<td>2.38 (.61)</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>0-4</td>
<td>2.40 (.65)</td>
<td>2.40 (.66)</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>0-4</td>
<td>2.49 (.65)</td>
<td>2.46 (.66)</td>
</tr>
</tbody>
</table>

Note. All means were adjusted for the masculinity covariate.
Table 8. Means for fear and defensive avoidance related to the four targeted health conditions by experimental group.

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>High Risk &amp; High Efficacy</th>
<th>High Risk &amp; Low Efficacy</th>
<th>No Risk &amp; High Efficacy</th>
<th>No Risk &amp; Low Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction (SD)</td>
<td>0-21</td>
<td>7.86 (4.83)</td>
<td>7.18 (4.84)</td>
<td>8.19 (4.84)</td>
<td>9.13 (4.83)</td>
</tr>
<tr>
<td>Chronic Conditions (SD)</td>
<td>0-21</td>
<td>10.00 (4.37)</td>
<td>11.05 (4.37)*</td>
<td>10.36 (4.37)</td>
<td>9.30 (4.37)</td>
</tr>
<tr>
<td>Overweight and Obesity (SD)</td>
<td>0-21</td>
<td>9.36 (4.69)</td>
<td>10.68 (4.70)</td>
<td>8.08 (4.70)</td>
<td>8.72 (4.70)</td>
</tr>
<tr>
<td>Sexual Performance (SD)</td>
<td>0-21</td>
<td>9.82 (4.77)</td>
<td>10.30 (4.77)</td>
<td>8.47 (4.77)</td>
<td>10.23 (4.77)</td>
</tr>
<tr>
<td>Defensive Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction (SD)</td>
<td>0-4</td>
<td>2.57 (.67)</td>
<td>2.66 (.67)</td>
<td>2.71 (.67)</td>
<td>2.55 (.67)</td>
</tr>
<tr>
<td>Chronic Conditions (SD)</td>
<td>0-4</td>
<td>2.37 (.60)</td>
<td>2.37 (.60)</td>
<td>2.39 (.60)</td>
<td>2.46 (.60)</td>
</tr>
<tr>
<td>Overweight and Obesity (SD)</td>
<td>0-4</td>
<td>2.40 (.65)</td>
<td>2.40 (.65)</td>
<td>2.41 (.65)</td>
<td>2.40 (.65)</td>
</tr>
<tr>
<td>Sexual Performance (SD)</td>
<td>0-4</td>
<td>2.45 (.65)</td>
<td>2.47 (.65)</td>
<td>2.46 (.65)</td>
<td>2.50 (.65)</td>
</tr>
</tbody>
</table>

Note. *p<.05, where significantly different from no risk and low efficacy group. All means were adjusted for the masculinity covariate.
Primary Hypotheses

Meeting Canadian Physical Activity Guidelines

A logistic regression analysis predicting whether participants met the Canadian Physical Activity Guidelines at Day 14 and controlling for (a) whether or not participants were meeting the Canadian Physical Activity Guidelines at baseline and (b) covariates (masculinity, scheduling self-efficacy, task self-efficacy, and response efficacy at Day 5) was performed. The logistic regression model was significant, $\chi^2(8, n=353)=62.98$, $p<0.001$ (refer to Table 9).

The logistic regression analysis revealed a significant Risk Information X Efficacy Information interaction, OR=$0.333$, 95% CI: 0.115-0.967, Wald=4.09, $p=0.043$. A restructured logistic regression equation indicated effects partially consistent with our primary hypotheses. Participants who received low efficacy information and did not receive risk information were more than twice as likely to meet the Physical Activity Guidelines at Day 14 than participants who received low efficacy information paired with risk information, OR=$2.15$ 95% CI:0.963-4.80, Wald=3.49, $p=0.062$ (refer to Table 9). However, there were no significant differences between participants who received high efficacy information paired with or without risk information in regards to meeting the Physical Activity Guidelines at Day 14, OR=$0.691$ 95% CI: 0.335-1.43, Wald=1.00, $p=0.317$ (refer to Table 9).
Table 9. Binary logistic regression models predicting whether men met the Canadian Physical Activity Guidelines at Day 14 and decomposing the 2-way Efficacy X Risk interaction.

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>High Efficacy</th>
<th>Low Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Met CPAG at Baseline</td>
<td>$\chi^2(5)=58.12^{**}$</td>
<td>$\chi^2(5)=22.95^{**}$</td>
<td>$\chi^2(5)=39.47^{**}$</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>4.14</td>
<td>3.74</td>
<td>5.09</td>
</tr>
<tr>
<td>Task Self-Efficacy</td>
<td>1.04</td>
<td>1.01</td>
<td>1.10</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>(.95-1.13)</td>
<td>(.90-1.13)</td>
<td>(.97-1.26)</td>
</tr>
<tr>
<td>Scheduling Self-Efficacy</td>
<td>1.08</td>
<td>1.08</td>
<td>1.10</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>(1.04-1.13)</td>
<td>(1.02-1.14)</td>
<td>(1.04-1.17)</td>
</tr>
<tr>
<td>Response Efficacy</td>
<td>1.01</td>
<td>.98</td>
<td>1.05</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>(.95-1.06)</td>
<td>(.91-1.06)</td>
<td>(.96-1.15)</td>
</tr>
<tr>
<td>Masculinity</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>(.99-1.01)</td>
<td>(.98-1.02)</td>
<td>(.98-1.02)</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Information</td>
<td>$\chi^2(7)=58.82^{**}$</td>
<td>$\chi^2(6)=23.96^{**}$</td>
<td>$\chi^2(6)=43.07^{**}$</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>1.93</td>
<td>.69</td>
<td>2.15</td>
</tr>
<tr>
<td>Efficacy Information</td>
<td>(.90-4.13)</td>
<td>(.34-1.43)</td>
<td>(.96-4.80)</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>2.07</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk X Efficacy</td>
<td>$\chi^2(8)=62.98^{**}$</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>.33</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. *p<.05, **p<.01. CPAG = Canadian Physical Activity Guidelines, OR = Odds Ratio, 95% CI = 95% Confidence Interval. The experimental condition that received risk information was set as the referent group for the risk variable and the experimental condition that received high efficacy information was set as the referent group for the efficacy variable. For the outcome variable, meeting the CPAG at Day 14 was coded as 1 and failing to meet the CPAG at Day 14 was coded as 0.
Physical Activity Behaviour

To determine whether participants in the different message groups increased their physical activity levels over time, a RM-ANCOVA controlling for the masculinity and efficacy covariates was conducted. Logarithmic-transformed total number of physical activity minutes at baseline and Day 14 were entered as the dependent variables and risk information and efficacy information were entered as the independent variables. A main effect for time was found, $F(1, 296)=4.67$, $p=0.031$, $\eta^2_p=.016$, where all participants significantly increased their physical activity levels from the baseline to Day 14 (refer to Table 10). A significant interaction between time and risk information also was discovered, $F(1, 296)=4.03$, $p=0.046$, $\eta^2_p=.013$. To decompose this interaction, participants who received risk information were compared with those who did not receive risk information. A follow-up RM-ANCOVA controlling for the masculinity and efficacy covariates with logarithmic-transformed total number of physical activity minutes at baseline and Day 14 as the dependent variables indicated that participants who received risk information ($d=.22$) significantly increased their physical activity levels while participants who did not receive risk information did not significantly increase their physical activity levels ($d=-.02$), $F(1, 157)=7.29$, $p=0.008$ (refer to Table 3). No other main effects or interactions were found.

Secondary Hypotheses

Intentions

To determine whether the different types of messages influenced participants’ intentions to engage in physical activity, a RM-ANCOVA controlling for the masculinity
and efficacy covariates was conducted. Intentions at baseline and Day 5 were entered as the dependent variables and risk information and efficacy information were entered as the independent variables. A main effect for time was found, $F(1, 345)=5.59$, $p=0.019$, $\eta_p^2=.016$, where participants increased their intentions to engage in physical activity from baseline to Day 5 (refer to Table 10). A main effect for efficacy information also was found, $F(1, 345)=4.10$, $p=0.044$. Participants who received high efficacy information had stronger intentions than participants who received low efficacy information ($d=.21$; refer to Table 10). No other main effects or interactions were found.

Table 10. Main effects for time, risk information, and efficacy information in regards to intentions and physical activity behaviour.

<table>
<thead>
<tr>
<th>Range</th>
<th>Time</th>
<th>Risk Information</th>
<th>Efficacy Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Day 5</td>
<td>Day 14</td>
</tr>
<tr>
<td>Total Physical Activity Min/Wk (SD)</td>
<td>-</td>
<td>200.00 (237.13)</td>
<td>254.93 (31.41)*</td>
</tr>
<tr>
<td>Intentions (SD) 0-14 (3.04) (2.35)*</td>
<td>8.92 (2.14)</td>
<td>10.11 (2.16)</td>
<td>9.68 (2.09)</td>
</tr>
</tbody>
</table>

Note. *$p<.05$. All means were adjusted for masculinity and efficacy covariates.

Tertiary Hypotheses

Bivariate correlations between the EPPM constructs are presented in Tables 11 and 12. Only correlations for relationships stated in the EPPM are described in the text.

Correlations with Fear

Bivariate correlations indicated that there were significant positive correlations between both participants’ perceived severity and susceptibility and their fear perceptions.
for all of the health conditions ($r = .17$ to .31, $p<0.01$). Therefore, increases in fear were associated with increases in perceptions of severity and susceptibility.

Bivariate correlations indicated that there were no significant correlations between both participants’ response efficacy and scheduling self-efficacy and their fear perceptions of all of the health conditions. Task self-efficacy was only significantly negatively correlated with participants’ fear perceptions of overweight and obesity ($p<0.05$). Therefore, increases in fear of overweight and obesity were associated with decreases in men’s task self-efficacy.

Bivariate correlations also indicated that for all of the health conditions, fear perceptions were significantly negatively correlated with defensive avoidance ($r = -0.16$ to $-0.33$, $p<0.01$). Thus, increases in fear were associated with significant decreases in defensive avoidance. Finally, intentions at Day 5 were only significantly positively correlated with participants’ fear perceptions of problems with sexual performance ($p<0.05$). As men’s perceptions of fear regarding problems with sexual performance increased, their intentions to engage in physical activity also increased.

*Correlation between Defensive Avoidance and Physical Activity Behaviour*

Bivariate correlations indicated that defensive avoidance of all of the health conditions were negatively correlated with physical activity behaviour. However, only defensive avoidance towards overweight and obesity was significantly negatively correlated with participants’ physical activity behaviours ($p<0.01$). Therefore, increases in men’s defensive avoidance towards overweight and obesity were associated with decreases in their physical activity behaviours.
### Table 11. Bivariate Pearson’s correlation coefficients among the threat, efficacy, intentions (Day 5), physical activity behaviour (Day 14), fear, and defensive avoidance variables.

<table>
<thead>
<tr>
<th></th>
<th>Severity</th>
<th>Susceptibility</th>
<th>Task SE</th>
<th>Scheduling SE</th>
<th>RE</th>
<th>Intentions</th>
<th>Total Physical Activity (Min/Wk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>.173**</td>
<td>.234**</td>
<td>-.096</td>
<td>-.013</td>
<td>.002</td>
<td>-.002</td>
<td>.003</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>.209**</td>
<td>.310**</td>
<td>-.098</td>
<td>.062</td>
<td>.103</td>
<td>.045</td>
<td>-.038</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>.218**</td>
<td>.282**</td>
<td>-.117*</td>
<td>.045</td>
<td>.087</td>
<td>.097</td>
<td>.092</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>.184**</td>
<td>.271**</td>
<td>-.081</td>
<td>.019</td>
<td>.044</td>
<td>.111*</td>
<td>.077</td>
</tr>
<tr>
<td>Defensive Avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>-.198**</td>
<td>.030</td>
<td>-.109*</td>
<td>-.155**</td>
<td>-.105</td>
<td>-.175**</td>
<td>-.026</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td>-.167**</td>
<td>-.077</td>
<td>-.055</td>
<td>-.129*</td>
<td>-.075</td>
<td>-.172**</td>
<td>-.083</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>-.158**</td>
<td>-.202**</td>
<td>-.091</td>
<td>-.136*</td>
<td>-.217**</td>
<td>-.225**</td>
<td>-.219**</td>
</tr>
<tr>
<td>Sexual Performance</td>
<td>-.147**</td>
<td>-.074</td>
<td>-.066</td>
<td>-.084</td>
<td>-.177**</td>
<td>-.082</td>
<td>-.072</td>
</tr>
</tbody>
</table>

Note. $p<.05*$ and $p<.01**$. SE = Self-efficacy and RE = Response Efficacy

### Table 12. Bivariate Pearson’s correlation coefficients between the fear and defensive avoidance variables for the four different health conditions.

<table>
<thead>
<tr>
<th></th>
<th>Defensive Avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Erectile Dysfunction</td>
</tr>
<tr>
<td>Fear</td>
<td>-.188**</td>
</tr>
<tr>
<td>Chronic Conditions</td>
<td></td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td></td>
</tr>
<tr>
<td>Sexual Performance</td>
<td></td>
</tr>
</tbody>
</table>

Note. $p<.01*$. 

98
Correlation between Intentions and Physical Activity Behaviour

A significant positive correlation between intentions at Day 5 and physical activity behaviour at Day 14 (r = .28, p<0.01) was documented. Therefore, as men’s intentions to become physically active increased, their physical activity participation per week also increased.

Discussion

The purpose of this study was to determine the most effective type of health messages based upon the tenets of the EPPM to encourage men to increase their physical activity levels in order to meet the Canadian Physical Activity Guidelines. We recruited a large sample of men who adhered well to the study protocol and we provided multiple doses of demographically-tailored information. Overall, the study findings provide some indication regarding the types of information to include in messages when trying to motivate men to increase their physical activity levels. However, it is evident that we need to further refine our methods for communicating risk and efficacy information to men. We also consider the study findings in the context of the EPPM. From these findings, we put forth preliminary recommendations regarding the development of physical activity messages for men and areas for future research.

According to our findings, regardless of the type of messages men received, they significantly increased their physical activity intentions and behaviours over time. These increases may have been the result of receiving messages, of participating and reflecting
upon their physical activity statuses and beliefs, or both. In mixed samples of men and women, the provision of at least some information to all participants has led to increases in physical activity behaviours (Latimer, Brawley, & Bassett, 2010) and thus may explain the observed changes in behaviour in the current study. There also seems to be benefit in having men at least consider their physical activity statuses and beliefs about physical activity information. Previous work has demonstrated that having individuals complete questionnaires led to significant increases in their behaviours in comparison to a control group (Godin, Sheeran, Conner, & Germain, 2008). Alternatively, men’s increases in their physical activity levels may have been due to completing the study’s questionnaires and reading the health messages. Research with a no message control group is warranted to clarify whether men’s behavioural changes is due to the impact of health messages or the mere measurement effect.

Our findings also supported the idea that the type of information included in messages for men may be an important factor to consider when promoting behaviour change. For example, both risk and efficacy information should be used in health messages for men. The combination of risk and efficacy information had effects on meeting the Canadian Physical Activity Guidelines. Risk information can lead to increases in physical activity behaviour, but these effects can be undermined if risk information is paired with low efficacy information. This finding is consistent with the notions of the EPPM (Witte, 1992). Therefore, it seems that risk information should be included with caution in messages for men. It also seems that high efficacy information
should be included in health messages for men. Men who received high efficacy information had stronger intentions than men who received low efficacy information. This finding supports previous research testing EPPM-based messages in general (Witte & Allen, 2000) and specifically with men (Morman, 2000), where men who received high efficacy information were more likely to form intentions to perform testicular self-examinations than men who received low efficacy information. High efficacy information also appeared to buffer against any negative responses to risk information, where men who received high efficacy information with or without risk information were equally likely to meet the Canadian Physical Activity Guidelines. Evidently, both risk and high efficacy information may be key components of health and physical activity messages for men.

Interestingly, changes in behaviour and intentions resulted in the absence of differences in risk and efficacy perceptions. Due to the influence of male gender roles, it is possible that men were not willing to admit their vulnerabilities and increased risk of the targeted health threats (Courtenay, 2000a). Men who conform to these gender roles may also overestimate their efficacy and ability to perform physical activity to demonstrate their independence (Courtenay, 2000a). Thus, conformity to male gender roles may be responsible for a lack of differences in men’s risk and efficacy perceptions. However, the absence of differences in these variables may also suggest that the message content was not strong enough to enhance men’s risk and efficacy perceptions.
Therefore, we need to investigate and determine new and more effective ways to accurately communicate risk and efficacy information to men.

The theme of health messages for men, such as focusing on general or sexual health, is another area to consider when developing these messages. The men appeared to be interested in receiving information related to sexual health, as indicated by participants expressing a preference for the message concerning sexual performance. However, our findings suggest that men may respond differently to messages related to sexual health in comparison to chronic conditions. For example, men who received risk information had stronger fear perceptions of overweight and obesity and weaker fear perceptions of erectile dysfunction. When men received risk information paired with low efficacy information, they also had stronger fear perceptions regarding chronic conditions including cardiovascular disease and Type II Diabetes. Therefore, it is plausible that while the effects of risk information about chronic conditions may be predicted by the EPPM, the same may not be true for messages about sexual health. Future research investigating whether men respond differently to messages addressing general and sexual health is warranted.

In addition to offering some practical recommendations for health messages for men, the findings also provide some insight into the relationships described in the EPPM. As predicted by the EPPM, the threat variables – severity and susceptibility – were significantly positively correlated with participants’ fear perceptions (Witte, 1992). These findings are congruent with the literature, as individuals have been shown to have
enhanced fear when they perceive a condition to be threatening (Witte & Allen, 2000). Defensive avoidance and physical activity behaviour were also negatively correlated. Since defensive avoidance and physical activity behaviour are competing responses to the messages, our results are congruent with the EPPM (Witte & Allen, 2000).

In contrast to the correlations between the threat variables and fear, the efficacy variables and intentions were generally not significantly correlated with participants’ perceptions of fear. The significant correlations between fear and defensive avoidance were opposite to the proposed relationship outlined by the EPPM (Witte, 1992). Therefore, it appears as though fear may play a different role in regards to influencing men’s efficacy perceptions, intentions, and defensive avoidance than outlined by the EPPM. Based upon other models that position fear as a key construct, such as the Stage Model of Processing of Fear-Arousal Communications (Das, de Wit, & Stroebe, 2003), fear may affect and bias efficacy perceptions. For example, individuals who experience fear and believe they are at risk for a health condition are more likely to positively bias their processing of the action recommendation (e.g. efficacy perceptions). These changes in perceptions may affect individuals’ intentions and behaviours. These findings suggest that future research should consider alternate processes by which fear affects the aforementioned constructs in relation to men’s health and physical activity behaviours.

The association between men’s intentions and physical activity behaviours also should be evaluated. The relationship between men’s intentions and physical activity behaviours in the current study was weaker ($r = .28$) than previously reported. For
example, a meta-analysis conducted by Hagger, Chatzisarantis, and Biddle (2002) revealed that the correlation between intentions and behaviours related to physical activity is generally strong ($r = .51$). While the meta-analysis included studies with both men and women, the current study solely focused on men. Therefore, it appears as though factors other than intentions may be more important predictors of physical activity behaviours amongst men. Schwarzer (2008) suggests that post-volitional factors, such as action and coping planning, may help to address the gap between intentions and behaviours. Therefore, future investigations of the roles of these post-volitional factors on men’s physical activity behaviours are warranted.

Our findings provide some practical and theoretical insight using the EPPM as a guiding framework to create effective health and physical activity messages for men. However, there are some areas of limitation. Online recruitment strategies were primarily used to obtain a convenience sample of participants. The minority of men (Statistics Canada, 2010b) who did not have access to the internet were not represented in our sample. The majority of participants also were well-educated and Caucasian. Therefore, caution should be taken when generalizing these findings to groups of men who were not represented in our sample. Despite our best efforts to inform and create effective risk and efficacy messages, the messages did not work as they were intended. Specifically, the manipulated risk and efficacy content of the messages were expected to elicit differences in men’s risk and efficacy perceptions and no differences were found. We did not have a no-message control group and cannot be certain whether the changes
in men’s intentions and behaviours were due to a mere measurement effect or the impact of the messages. The messages discussing sexual health also may not have been different enough as erectile dysfunction and sexual performance may be considered to be similar and overlapping health concerns by some men. Due to the online format of the current study, we cannot guarantee that the men read all of the health messages. However, the majority of participants recalled key points that were directly related to the themes of the messages. Therefore, the message recall data suggest that the majority of men read and paid attention to the messages. Finally, some of the measures we used may not have truly captured men’s risk and efficacy perceptions. Due to men’s conformity with male gender roles, they may have been unwilling to provide accurate measures of their true risk and efficacy perceptions. Therefore, future research endeavours should address how to effectively communicate risk and efficacy information to men and how to accurately measure their risk and efficacy perceptions.

According to these preliminary findings, providing health information to men may be an important step to elicit adaptive health behaviour change. When providing this health information, both risk and efficacy information should be considered. Risk information should be delivered with caution, and should likely be accompanied by high efficacy information. However, we still need to address and discover new ways to effectively communicate risk and efficacy information to men. While the EPPM may be a valuable framework to use when developing health and physical activity messages for men, more research is needed to clarify the role of fear in regards to men’s physical
activity behaviours. By addressing these gaps and delivering health information and messages to men, improvements in men’s health behaviour practices and quality of life may result.
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Chapter 5

General Discussion

5.1 Summary of Key Findings

The overall theme of this thesis was investigating and testing new and effective ways to communicate health information to men. The first manuscript presented the findings from a qualitative investigation of men’s health concerns and opinions about current health magazines and messages. Through this work, it became evident that the EPPM is a valuable theoretical framework for guiding the development of health messages for men. The men could easily relate to the four key constructs of the EPPM and provided positive feedback about health and physical activity messages based upon the tenets of the EPPM. From participants’ discussions and feedback about the content of health advertisements and health messages, we were able to formulate preliminary recommendations regarding the content of health messages for men. For example, health messages for men should identify and target health conditions that can be prevented by modifiable behaviours (e.g. physical activity). This health information should be presented with demographically-tailored statistics from reputable sources and conveyed through strong language. Self-regulatory strategies (e.g. planning) also should be presented to enhance readers’ self-efficacy to perform the recommended behaviour. Finally, sex appeal may be incorporated into the message content to capture men’s attention, but should be included in health messages with caution.
Using the recommendations from the findings of the first study, four sets physical activity messages that targeted four different health conditions and were based upon the tenets of the EPPM were created for and tested in the second study. Each set of physical activity messages had four variations, where messages consisted of high or no risk information paired with high or low efficacy information. With some support for our hypotheses, we were able to put forth practical recommendations for physical activity messages for men and offer some insight into the relationships between the constructs of the EPPM.

When examining differences between the message groups, it was evident that the type of information included in the messages may be an important factor to consider when promoting behaviour change. For example, providing risk and efficacy information to men may be effective at eliciting physical activity behaviour change. However, risk information should be provided with caution as it can lead to behaviour change, but it may negatively influence men’s physical activity behaviours when partnered with low efficacy information. Therefore, high efficacy information should also be included in health messages due to its positive effects on intentions and protective effects against risk information. However, it was also evident that the messages in the second study did not affect men’s risk and efficacy perceptions as intended as shown by a lack of differences in risk and efficacy scores between the groups. Therefore, while the second study emphasized the importance of ensuring the appropriate balance between risk and efficacy
information, it also highlighted the need to discover new and more effective ways to communicate risk and efficacy information to men.

In terms of evaluating the relationships outlined by the EPPM, the second study emphasized that the role of fear in regards to men’s physical activity behaviours may be unclear. While fear was significantly correlated with the threat constructs in the expected direction, it generally was not related to efficacy perceptions, intentions, or defensive avoidance in ways that were congruent with the tenets of the EPPM. The relationship between intentions and physical activity behaviour also was weaker than expected. Thus, the second study highlighted that more work must be done to determine the role of fear and post-volitional factors in relation to men’s physical activity behaviours.

5.2 Strengths of the Thesis

Overall, both of the studies had important strengths. The first study was the first known qualitative investigation of the utility and relevance of the EPPM to health and physical activity message content specifically for men. The second study was the first known investigation of the effectiveness of physical activity messages based upon the EPPM to motivate men to increase their physical activity levels. The second study also was conducted with a large sample in which participants adhered well to the study protocol. I was able to obtain a large sample primarily through using online recruitment strategies, such as advertising on www.facebook.com. Because the men who were recruited online were likely frequent internet users, they may have been more willing to
complete the entire study since it was conducted online. Therefore, it appears as though online advertisement strategies may be a very good option to recruit men for health-promotion research. Overall, both of the studies provided novel theoretical and practical contributions to the current literature regarding health and physical activity messaging for men.

Two of the major strengths of my thesis overall were the use of theory and a mixed methods approach. Theoretical frameworks provide insight into key determinants of health behaviour change and outline important behavioural constructs to target in health messages (Brawley & Latimer, 2007; Rothman, 2004). Therefore, I decided to use the EPPM as a theoretical framework to guide both studies of my thesis. To ensure that both the EPPM and the health message content would be relevant and appealing to men, an exploratory qualitative investigation was conducted first. Pilot tests of preliminary messages were also conducted during this first study. Using the information gathered from the findings of this qualitative investigation, health and physical activity messages based upon the EPPM framework were formulated and tested in the second study. Therefore, a strong theoretical basis was used to formulate the content of the messages that were tested in the second phase of my thesis.

Finally, a significant strength of my thesis was collaborating with public health practitioners from the Hastings and Prince Edward Counties Health Unit (Belleville, Ontario). In fact, the original research idea came from a local public health unit. As researchers, it is important to remember that while we may design interventions that are
grounded in theoretical frameworks, the success of interventions may be dependent upon their practicality. Collaborating with public health practitioners offered me a practical point of view and reminded me about the types of interventions that are feasible to deliver in a community setting. Because public health practitioners may be potential users of health and physical activity messages, it is important to ensure that they approve of and support the types and content of health messages that will be tested. Therefore, I ensured that my two public health collaborators reviewed and provided feedback about the content of the physical activity messages that were tested in the second study. As a result, not only were the physical activity messages that were tested in the second study applicable to men, but the messages also were supported by potential users in the public health sector.

5.3 Limitations of the Thesis

Despite the interesting and novel contributions, my thesis research was limited in several ways. Both studies used convenience sampling. The sample of participants for the first study was primarily active. Therefore, it is possible that these men may not have accurately represented the opinions of men who I was trying to target in the second study – men who are not currently active. Moreover, the majority of participants in both studies was Caucasian and had pursued post-secondary education. Research has shown that individuals with lower levels of education and individuals who belong to groups of ethnic minority tend to have higher health risks associated with morbidity and mortality.
(Courtenay, 2003; Winkleby, Jatulis, Frank, & Fortmann, 1992). Thus, it is also possible that the men who have higher health risks and are in greater need of informational health resources were not accurately represented in the studies of my thesis.

Each of my studies also had its own specific limitations. During the first study, I moderated two of the focus groups and all of the telephone interviews for logistical reasons. Because I am a woman in my twenties, it is possible that the men may not have felt comfortable expressing their true opinions regarding their health behaviours and concerns. As a result, the men’s responses during the discussions may have been affected and certain themes related to the men’s health concerns may have not emerged. Focus groups also create a collaborative environment that may not accurately depict the typical environment where men will receive health messages (Powell & Single, 1996). Therefore, the men may have responded to discussion questions in ways that conformed to the group’s opinions rather than how the men would have expressed themselves in an independent setting.

In order to measure constructs of the EPPM in the second study, I used the Risk Behaviour Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996). Previous use of this scale has focused on other health behaviours and risks (e.g. HIV transmission) and has demonstrated sensitivity to differences in messages with high and low threat and efficacy content (McKay, Berkowitz, Blumberg, & Goldberg, 2004). However, this scale may not have accurately measured certain constructs in the second study. For example, risk and efficacy perceptions were not significantly different between the four message
groups. It is possible that this scale was unable to appropriately measure men’s risk and
efficacy perceptions due to their identification with male gender roles. Men who
conform to male gender roles may not be willing to admit their vulnerability to different
health risks or their inability to successfully adopt and maintain health behaviours
(Courtenay, 2000). Therefore, when conducting research with men it is important to
consider how social norms may affect their responses to questionnaires. Evidently, future
research must consider new ways to accurately measure constructs that may conflict with
gender roles, such as risk and efficacy perceptions.

Finally, another area of limitation in the second study was a lack of a no-message
control group. The mere measurement effect has been documented in other health
behaviours (Godin, Sheeran, Conner, & Germain, 2008; Sandberg & Conner, 2009),
where individuals who answer questionnaires are more likely perform the given
behaviour than individuals who do not answer questionnaires. Since all participants
received physical activity messages, it is difficult to determine whether the increases in
men’s intentions and physical activity behaviours were due to the impact of the messages
or the mere measurement effect.

5.4 Future Research Directions

Through the participants’ focus group discussions from the first study, areas of
future research consideration were highlighted. For example, men preferred messages
that were supported by reputable sources. Previous research has shown that highly
credible sources tend to elicit more changes in attitudes and behaviours than sources with low credibility (Pornpitakpan, 2004). To address this finding, future research should investigate the types of sources that men believe to be credible and whether including these credible sources in health messages will translate into behaviour change.

The idea of using sex appeal to enhance message appeal and capture men’s interest was also highlighted in the first study. Health messages and advertisements that use sex appeal have not been widely investigated in the literature. Therefore, prior to developing health interventions for men that target sex appeal, researchers should examine whether health messages and advertisements that use sex appeal are effective at not only increasing men’s attention, but also men’s health behaviour practices. For example, future research should investigate whether health messages that use sex appeal are more effective at eliciting greater behaviour changes among men than identical health messages that do not use sex appeal. Until these studies are performed, it is difficult to determine whether developing health messages for men that target and use sex appeal are justified.

Men also expressed interest in receiving information about their sexual health in addition to their general health. This theme was further emphasized during the second study as the men’s most preferred message discussed sexual performance. However, since sexual health concerns may only affect quality of life while general health concerns pose a greater threat due to the potential loss of life expectancy, men may react differently to messages about general and sexual health. Therefore, future research
should investigate whether men react differently to health messages targeting general and sexual health and whether men are more likely to adopt health behaviours to promote general versus sexual health.

The second study also highlighted the uncertainty regarding the role of fear and men’s efficacy perceptions, intentions, and physical activity behaviour. To better understand the role of fear, more investigations of health messages that target men’s fear are warranted. Based upon other models that position fear as a key construct, such as the Stage Model of Processing of Fear-Arousal Communication (Das, de Wit, & Stroebe, 2003), I would like to see examinations of how fear affects and biases efficacy perceptions related to physical activity and whether these changes in perceptions affect physical activity behaviour. From results of this study, there also appears to be a disconnect between fear and intentions. Inquiries into the processes and other factors that may affect the relationship between fear and intentions would provide a novel contribution to the literature. I think it also would be beneficial to determine whether fear influences the persuasiveness of framed physical activity messages. Gerend and Maner (2011) recently showed that during an emotional state of fear, participants were more likely to increase their fruit and vegetable intake when they were exposed to a loss-framed message, or a message that accentuates the costs of not engaging in a behaviour, in comparison to a gain-framed message, or a message that highlights the benefits of engaging in a behaviour. Since the messages in the current study were all gain-framed, it is difficult to determine whether this framing effect due to fear perceptions also applies to
physical activity messages for men.

Finally, a major concern in the second study was the fact that the messages may not have been strong enough to evoke differences in risk and efficacy perceptions. Therefore, it is crucial to establish new ways to effectively communicate risk and efficacy information to men through health messaging. Addressing these gaps in the literature will contribute to the development of relevant and persuasive health messages for men helping to reverse their current patterns of adverse behaviours.

5.5 Theoretical Implications

By investigating and evaluating the utility and effectiveness of the EPPM in both a qualitative and quantitative manner, we have been able to gain a better understanding of using the EPPM as a guiding framework for health messages for men. The findings from the first study highlighted that men were able to relate easily to the four key constructs of the EPPM and believed that health messages should address each of these constructs.

The results of the second phase of the thesis provided some support for using the EPPM to create physical activity messages for men. Specifically, providing risk information led to greater changes in physical activity behaviour. Men who received high efficacy information had greater intentions to be physically active than men who received low efficacy information. The combination of risk and efficacy information had effects on whether men met Canada’s Physical Activity Guidelines at the two-week follow up. Therefore, using the EPPM as a theoretical framework to guide message
content led to positive changes in men’s intentions and behaviours in ways that were generally predicted by the model.

While the relationship between fear and risk perceptions in the second study was as expected, a disconnect between fear, efficacy perceptions, intentions, and defensive avoidance was discovered. Therefore, the role of fear in promoting physical activity behaviour amongst men is unclear. Further investigations with other models that position fear as a contributor to behaviour change may be warranted to determine the role of fear in physical activity behaviour change amongst men.

Finally, the men provided positive feedback about the EPPM and believed that it was a relevant framework to use when developing health messages for men. During the men’s evaluation of the drafted messages in the first study, they provided positive feedback about the content of the messages. The messages also appeared to be well-received during the second study as the majority of the men were able to recall the message content in sufficient detail. Therefore, due to the perceived relevance of the EPPM and its constructs to men and their health behaviours, the EPPM may be a valuable framework to use when developing health and physical activity messages for men.

5.6 Public Health Implications

Overall, the findings from the first study support the ideas that men are concerned about their health and are willing to obtain information to improve their knowledge about how to combat certain health risks. The findings from the second study provide direction
regarding the types and combination of information that should be included in physical activity messages for men. Although we have highlighted areas for future research consideration, the two studies that have been presented provide initial insight into how to develop and communicate health information to men.

The results of the first phase of my thesis provide some preliminary recommendations for health message content for men. For example, the findings provide insight into the types of health behaviours to target, such as modifiable behaviours. The results also address how to effectively convey the health information presented in the messages, including the use of tailoring and strong language. As a result, the public health sector may begin to plan new health messaging initiatives and programs targeting men.

The findings of the second phase of my thesis provide some evidence regarding the types of information that should be included in physical activity messages for men. Risk information led to stronger increases in men’s physical activity levels. Men who received high efficacy information had stronger intentions than men who received low efficacy information. High efficacy information also appeared to buffer against any negative responses to risk information. Evidently, providing risk information paired with high efficacy information may be the optimal combination of information to include in physical activity messages for men. By providing this combination of information in physical activity messages for men, they may become more motivated to adopt and maintain their physical activity behaviours.
Finally, the second study also provides some practical recommendations for reaching men regarding health-promotion research and initiatives. I was able to recruit a large sample of men who adhered well to the study protocol and attribute this to using online recruitment strategies. Since these men are already online and using the internet, they may be more likely to complete a study or read health messages online than on paper. Therefore, in order to maximize the public health sector’s reach to men, advertising health-promotion initiatives and research via the internet may be a very good solution.

5.7 Summary

Taken together, the findings from this thesis begin to address gaps in the current literature. From these two studies, both practical and theoretical implications have emerged in regards to health and physical activity messaging for men. We also have also discovered areas that require future research consideration. Building upon the findings of the current thesis and addressing the gaps in the literature, researchers and public health practitioners may work towards developing effective health messages and initiating successful health-promotion campaigns for men.
5.8 References


Appendix A

Research Ethics Board Approval

November 25, 2010

Dr. Amy Latimer
Assistant Professor
School of Kinesiology and Health Studies
Queen's University

GREB ref. #: GPHIE-053-08
Title: “Understanding and Optimizing the Impact of Gain- and Loss-Framed Health Messages”

Dear Dr. Latimer:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from November 17, 2010. Prior to the next renewal date you will be sent a reminder memo and form to reapply.

You are reminded of your obligation to advise the GREB, with a copy to your unit REB if applicable, of any adverse event(s) that occur during this one year period (details available at webpage http://www.queensu.ca/oro/researchethics/GrebelREB/forms.html - Adverse Event Report Form). An adverse event includes, but is not limited to, a complaint, a change or an unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementations of new aspects into the study procedures on the Ethics Change Form that can be found at http://www.queensu.ca/oro/researchethics/GrebelREB/forms.html – Research Ethics Change Form. These changes must be sent to the Ethics Coordinator, Gail Irving, at the Office of Research Services or irvingg@queensu.ca prior to implementation. Mrs. Irving will forward your request for protocol changes to the appropriate GREB reviewers and/or the GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

[Signature]

Joan Stevenson, Ph.D.
Professor and Chair
General Research Ethics Board

c.c.: Lawrence Brawley, Kinesiology, University of Saskatchewan, Co-investigator
Dr. Spencer Moore, Chair, Unit REB
Josie Birchall, Dept. Admin.

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Appendix B

Recruitment Materials for Study 1

E-mail to Workplaces

Hello,

My name is Alexandra Hatchell. I am currently pursuing my Master of Science under the supervision of Dr. Amy Latimer in the School of Kinesiology and Health Studies at Queen’s University. My thesis project will be examining messages concerning health behaviours for men ages 25 to 55 years. In order to examine meaningful health message content for men, I am conducting a series of focus groups with men. This project has been approved by the Queen’s University’s General Research Ethics Board. In these focus groups, the goal will be to help determine what types of information regarding healthy behaviours is applicable and meaningful for men. For example, we are unaware of the health conditions (e.g. chronic heart disease) and behaviours (e.g. physical activity, healthy eating) that men are concerned and want to gain more information about. By carrying out these focus groups, I am hoping to obtain information that will help me create messages regarding health behaviours that are relevant and of interest to men.

The focus group will consist of discussion questions, followed by a discussion and brainstorming session of responses with the members of the focus group. A focus group facilitator will be present to help guide the focus group through the discussion questions and facilitate conversation. Ideally, the focus group would consist of 6 to 8 participants. Should more than 8 individuals express interest, more than one focus group would be organized. Compensation will be provided to each of the focus group participants in the form of $20 Canadian Tire gift cards. Snacks (e.g. lunch) and refreshments will also be provided.

The timing of the focus group is flexible. I can arrange for a focus group to happen on most days of the week (e.g. Wednesday afternoons and anytime Monday, Tuesday, Thursday, and Friday). The timing would be determined by the schedules of the participants. From my experience with other workplaces, lunch hour tends to be the most feasible. The venue for the focus group can be located on Queen’s campus, or if more feasible for the participants of the focus group, it may be located at your workplace location.

If you have any further questions, please do not hesitate to contact me via e-mail or telephone. Please let me know if you are interested in this research endeavor and are willing to pass this information onto your members.
Looking forward to hearing from you and best regards,

Alex Hatchell
M.Sc. Candidate

School of Kinesiology and Health Studies
Queen’s University
28 Division Street
Kingston, ON
K7L 3N6

E-mail: 6ah12@queensu.ca
Phone: 613-533-6000 x74699
Appendix C
Study 1 Letter of Information and Consent and Questionnaire

Letter of Information and Consent

Focus Group Session about Men’s Health Behaviours and Concerns

Investigators:

Principal Investigator: Dr. Amy Latimer
Department of Kinesiology and Health Studies
Queen’s University
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Stacey Kimura
Hastings and Prince Edward Counties Public Health Unit
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E-mail: SKimura@hpechu.on.ca

Purpose of the Study

The purpose of this focus group session is to gather information regarding health concerns and behaviours that are applicable and meaningful to men.

Procedures Involved in the Research

This focus group session will take about 60 minutes to complete. First you will be given a set of discussion questions regarding health behaviours and health concerns for men. You will be asked to discuss your thoughts and opinions regarding these questions with the focus group facilitator and other participants. Next, you will be shown a series of health advertisements from magazines and you will be asked to offer your opinions regarding the health advertisements. The focus group discussions will be audio recorded.

After completing the focus group session you will receive a $20 gift card from Canadian Tire. Snacks and refreshments will also be provided.
Potential Harms, Risks or Discomforts:

There are no known risks to participation in this focus group session.

Potential Benefits

As a participant, you can take pride in knowing that you are contributing to a novel study involving health messaging and men. Through your involvement, you are enabling a research study in which findings might have an important impact on future health promotion messaging techniques for men. You also will receive a $20 gift card from Canadian Tire for your time.

The scientific community and society may benefit by being able to expand its knowledge about effective health messages for men.

Confidentiality

The information gathered by the research team from the focus group will be kept confidential. During the focus group discussions, please respect the opinions of the other participants and keep the opinions expressed by other participants confidential. The audio recording and your information will be stored in a password-protected file on a password-protected computer in the social sciences lab. This file containing your information will be stored separately from the audio recording. The data will be published in a composite form and the researchers will have no ability to trace you as an individual. All records are stored safely under password protection and in locked cabinets.

Participation and Withdrawal

Your participation is completely voluntary and you may withdraw from this focus group at any time without any consequences. Should you decide that you do not wish to be audio recorded, you may withdraw from the focus group.

Information about the Study Results

I expect to have the focus group sessions completed by February 2011. If you would like a brief summary of the results, please let me know how you would like it sent to you.

Questions or Concerns

If at any time I have further questions, problems, concerns or would like to withdraw from the study, I can contact the project supervisor, Dr. Amy Latimer, amy.latimer@queensu.ca, (613)533-6000 x 78773, Dr. Jean Côté, Director of the School of Kinesiology and Health Studies, SKHS.Director@queensu.ca, (613) 533-6601, or the Chair of the General Research Ethics Board, Dr. Joan Stevenson, chair.GREB@queensu.ca, (613) 533-6081.
Subject Statement of Consent

I have read and understand the consent form for this study. I have been given sufficient time to consider the above information and to seek advice if I chose to do so.

If you understand and accept these conditions, please indicate your consent with your signature to the following statements:

I agree to participate in the focus group.

Signature: ______________________________________

Name of Participant (Printed): ______________________________________

**Please keep a copy this form for your records**

Study 1 Questionnaire

Please answer the following questions about yourself. All answers are strictly confidential.

1. Are you male or female?
   - [ ] Male
   - [ ] Female

2. What is your date of birth?  Day:_______ Month:__________ Year:_____

3. How old are you? _____ years

4. People living in Canada come from many different cultural and racial backgrounds. Which of the following backgrounds best describes you? You can check more than one option.
   - [ ] White
   - [ ] Chinese
   - [ ] South Asian/East Indian (e.g. East Indian, Pakistani, Sri Lankan, etc.)
   - [ ] Black
   - [ ] Filipino
   - [ ] Latin American
☐ South East Asian (e.g. Cambodian, Indonesian, Laotian, Vietnamese)
☐ Arab
☐ West Asian (e.g. Afghan, Iranian, etc.)
☐ Japanese
☐ Korean
☐ Aboriginal People of North America (North American Indian, Métis, Inuit/Eskimo)
☐ Other (please specify): ____________________________

5. What is your highest level of education?
☐ Less than high school
☐ High school
☐ Some college (no degree)
☐ College degree
☐ Some university (no degree)
☐ University – Bachelor-level degree (B.A., B.Sc., etc.)
☐ University – Master-level degree (M.A., M.Sc., etc.)
☐ University – Doctorate-level degree (Ph.D.)

6. What is your marital status?
☐ Single
☐ Common-law
☐ Married
☐ Divorced
☐ Other
☐ Do not wish to specify

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.
1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

____ days per week

□ No vigorous physical activities

→ Skip to question 3

2. How much time did you usually spend doing vigorous physical activities on one of those days?

____ hours per day

____ minutes per day

□ Don’t know/Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

____ days per week

□ No moderate physical activities

→ Skip to question 5

4. How much time did you usually spend doing moderate physical activities on one of those days?

____ hours per day

____ minutes per day

□ Don’t know/Not sure
Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?
   
   _____ **days per week**
   
   [ ] No walking  ➔ **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

   _____ **hours per day**
   
   _____ **minutes per day**
   
   [ ] Don’t know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

   _____ **hours per day**
   
   _____ **minutes per day**
   
   [ ] Don’t know/Not sure
Appendix D
Focus Group and Telephone Interview Guides

Focus Group #1 Guide

General Starting Questions:

1. What do you consider as “unhealthy behaviours”?
2. What do you think are the top 5 major health concerns of men?

Perceived Severity: an individual’s beliefs about the seriousness of the condition.

1. In your opinion, how serious are these conditions (listed above) to your well-being?
2. Do you believe that these conditions pose a danger to one’s health and life expectancy?
3. What type of information or evidence would you need to make a decision as to whether a condition is serious or not?

Perceived Susceptibility: an individual’s beliefs about his chances of experiencing the condition.

1. With your current lifestyle, do you believe that you are at risk for developing any of these conditions?
2. Which conditions do you think you are most susceptible to? Why?
3. What type of information or evidence would you need to make a decision as to whether you may be susceptible to developing and experiencing one of these conditions?

Magazine Advertisements
1. Are there any advertisements that capture your interest?
2. What part of the advertisement attracts your attention?
3. What do you like about the advertisement? What do you not like about the advertisement?
4. What would make the advertisements more eye-catching or appealing?
5. What would you ideally like to see in a health advertisement?
Focus Group #2 Guide

General Starting Questions:

1. What do you consider as “unhealthy behaviours”?
2. What do you think are the top 5 major health concerns of men?

Perceived Response Efficacy: an individual’s beliefs as to whether a given response effectively prevents the threat.

1. What types of responses do you think are the most effective strategies for combatting the effects of an unhealthy lifestyle? The least effective? Why?
2. What types of information or evidence would you need to make a decision regarding whether a given response actually prevents a condition from occurring or worsening?

Perceived Self Efficacy: an individual’s beliefs of whether he has the ability to perform the recommended response.

1. How confident are you in your ability to adopt a preventative response? Why or why not?
2. Do you think that you could create a plan of action and execute it to prevent conditions associated with an unhealthy lifestyle from taking place?
3. Which responses do you think are easier to perform? More difficult to perform? Why?
4. What types of information or evidence would you need to make you more confident in your ability to perform a given response?

Magazine Advertisements

1. Are there any advertisements that capture your interest?
2. What part of the advertisement attracts your attention?
3. What do you like about the advertisement? What do you not like about the advertisement?
4. What would make the advertisements more eye-catching or appealing?
5. What would you ideally like to see in a health advertisement?
Focus Groups #3-4 and Telephone Interviews #1-4 Guide

General Questions

1. What do you consider as “unhealthy behaviours”?
2. What do you think are the top 5 major health concerns of men?

Magazine Advertisements

1. Are there any advertisements that capture your interest?
2. What do you like about the advertisement? What do you not like about the advertisement?
3. What would you ideally like to see in a health advertisement (e.g. to make more eye-catching and appealing)?

Messages #1 and #2 (Threat Messages)

1. Which message (#1 or #2) is more compelling and why?
2. Are there any parts of the message that stand out (e.g. are overblown, realistic, make the threat seem relevant or important)?
3. What types of information are missing and could be added that would prove to you that the health threat is serious?
4. What types of information are missing and could be added that would prove to you that you could be susceptible to developing the health threat?

Messages #3 and #4 (Efficacy Messages)

1. Which message (#3 or #4) is more compelling and why?
2. Do you have any ideas or examples that demonstrate that incorporating physical activity into your daily schedule can be easy? In reference to the plan in message #3, what do you think about the suggested times and activities outlined in the plan?
3. What types of information are missing and could be added that would prove to you that physical activity is effective at reducing your health risk?
4. What types of information are missing and could be added that would prove to you that physical activity is easy to add to your schedule?
# Appendix E

## Sample Size Calculation for Study 2

Using G*Power software and Witte, Berkowitz, Cameron, and McKeon’s (1998) reported data:

**Statistical Test and Power Characteristics**

<table>
<thead>
<tr>
<th>Tests Family</th>
<th>F</th>
</tr>
</thead>
</table>

| Statistical Test | ANOVA: Fixed effects, special, main effects, and interactions |
| Type of Power Analysis | A priori: compute sample size – given $\alpha$, power, and effect size |

**Input Parameters**

| Effect Size ($f$) | 0.25 (Medium Effect) |
| $\alpha$ Error Probability | 0.05 |
| Power ($1 - \beta$ Error Probability) | 0.95 |
| Numerator df | 3 |
| Number of Groups | 4 |

**Output Parameters**

| Noncentrality Parameter $\lambda$ | 17.44 |
| Critical F | 2.64 |
| Denominator df | 275 |
| Total Sample Size | 279 |
| Actual Power | 0.9502518 |
Appendix F

Canada’s Physical Activity Guidelines

To achieve health benefits, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.

It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week.

More physical activity provides greater health benefits.

Source: Canadian Society for Exercise Physiology (2011).
Appendix G
Recruitment Materials for Study 2

Letter to Workplace Employers

Hello,

My name is Alex Hatchell. I am currently pursuing my Master of Science under the supervision of Dr. Amy Latimer in the School of Kinesiology and Health Studies at Queen’s University. In partnership with the Hastings and Prince Edward Counties Health Unit, Dr. Latimer and I are conducting a study investigating health messages for men.

This study is specifically examining whether health messages that (a) target the health risks associated with physical inactivity and (b) provide information about how to become more physically active affect men’s intentions and physical activity behaviours. The goal of the study is to determine what types of health messages are most effective at promoting changes in intentions and health behaviours amongst men. Using the data and results from this study, informational resources and tools for men will be developed to encourage the adoption of health behaviours (i.e. healthy eating and physical activity).

I am currently looking to recruit men between the ages of 25 and 45 years to participate in this study. This study is done completely online and all participants will receive compensation.

I would greatly appreciate your help in my recruitment process by notifying your employees about this participation opportunity. If you would be willing to distribute an invitation to participation to your employees, I have attached a letter of information that can be sent directly to your employees. I have also attached a flyer that could be posted in your workplace.

Thank you for your time and consideration. I look forward to hearing from you.

Sincerely,
Alex Hatchell
M.Sc. Candidate

School of Kinesiology and Health Studies
Queen’s University
28 Division Street
Hello!

In partnership with the Hastings and Prince Edward Counties Health Unit (Belleville, ON), researchers in the School of Kinesiology and Health Studies at Queen's University (Kingston, ON) are currently conducting a study about health messages for men.

We are looking for men between 25 and 45 years to participate in this study. This study is done completely online.

Eligible participants will receive up to $15 and be entered in a draw to win one of four $500 gift cards to local home improvement centers (i.e. Canadian Tire, Home Depot, Home Hardware, Lowe's, and RONA).

If you are interested in participating, please visit the following website:
http://ca.studentvoice.com/queens/hatchellMSethesisdav1

If you would like more information about this study, please e-mail or call the researchers:
E-mail: messaging.and.motion@queensu.ca
Phone: 613-533-6000 x74699

Your participation is truly appreciated. Thank you for both your time and consideration.

Best regards,

Alex Hatchell

M.Sc. Candidate
School of Kinesiology and Health Studies
Queen’s University
28 Division St.
Kingston, ON
K7L 3N6
ATTENTION
MEN NEEDED
for a study about health messages

We are currently recruiting men between the ages of 25 and 45 years for a study about health messages.

Eligible participants will receive up to $15 and be entered in a draw to win 1 of 4 $500 gift certificates to local home improvement stores.

This study is done completely online.

If you are interested in participating, please visit the following website:

www.menshealthstudy.yolasite.com

If you would like more information, please e-mail or call the researchers:

messaging.and.motion@queensu.ca
Alex at (613) 533-6000 ext. 74699
Recruitment Advertisements on www.facebook.com

Advertisement used for Kingston and Belleville:

QUEEN’S STUDY: MEN NEEDED
menshealthstudy.yolasite.com
We are looking for men (25 to 45 years) to participate in an online study about health messages! Compensation will be provided.

Advertisements used for the Greater Toronto Area and Ottawa:

QUEEN’S STUDY: MEN NEEDED
menshealthstudy.yolasite.com
We are looking for men in the GTA (25-45 yrs) to participate in an online study about health messages. Compensation will be provided.

Advertisements used for Halifax and Vancouver:

QUEEN’S STUDY: MEN NEEDED
menshealthstudy.yolasite.com
We are looking for men in Halifax (25-45 yrs) to participate in an online study about health messages. Compensation will be provided.

QUEEN’S STUDY: MEN NEEDED
menshealthstudy.yolasite.com
We are looking for men in Vancouver (25-45yrs) to participate in an online study about health messages. Compensation will be provided.
Appendix H
Study 2 Letter of Information and Consent

Investigators:
Principal Investigator:
Dr. Amy Latimer
School of Kinesiology & Health Studies
Queen's University
Kingston, Ontario, Canada
(613) 533-6000 ext. 78773
E-mail: amy.latimer@queensu.ca

Co-Investigators:
Alex Hatchell (M.Sc. Candidate)
School of Kinesiology & Health Studies
Queen's University
Kingston, Ontario, Canada
(613) 533-6000 ext. 74699
E-mail: 6ah12@queensu.ca

Purpose of the Study
The purpose of this study is to examine the effectiveness of health messages for men.

Procedures Involved in the Research
This study will involve four stages.

1) First, you will be asked to complete a brief eligibility survey. If you are ineligible for this study, you will be forwarded to an exit screen that will explain why you were excluded from this study. If you are eligible to participate in the study, you will be asked to complete a brief survey that should take approximately 15 minutes to complete.

2) You will then be contacted via e-mail for four consecutive days. Each day, you will receive an e-mail that contains a URL link that will take you to a health message. Each health message will take approximately 5 minutes to read. After reading each health message, you will be asked to complete a brief survey that should take approximately 5 minutes to complete.

3) On the fourth day and after you have read the four different health messages, you will then be asked to complete a survey that should take approximately 30 minutes to complete.

4) Finally, you will be contacted two weeks after your enrollment in the study and asked to complete a survey that should take approximately 25 minutes to complete.

Payment
For your time and involvement in this study, you have the potential to receive up to a total of $15 in gift cards. You also have the potential to submit up to a total of five ballots to enter in a draw to win one of four $500 gift cards to local home improvement centers (i.e. Canadian Tire, Home Depot, Home Hardware, Lowe's, and RONA).
When you complete the first online survey, you will be given a ballot that you can fill out online. This ballot will enter you in a draw to win one of four $500 gift cards to local home improvement centers (i.e. Canadian Tire, Home Depot, Home Hardware, Lowe's, and RONA).

After completing the second online survey, you will be sent a $10 gift card. Finally, when you complete the last online survey, you will be sent a $5 gift card.

As previously mentioned, you will be sent an e-mail each day for four days and will be asked to read a health message on each of those days. After reading each of the health messages and completing each of the brief health message evaluation surveys, you will be given a ballot that you can fill out online. Therefore, you will receive up to a total of five ballots for reading the four health messages and completing the first online survey. These ballots will enter you in a draw to win one of four $500 gift cards to local home improvement centers (i.e. Canadian Tire, Home Depot, Home Hardware, Lowe's, and RONA).

<table>
<thead>
<tr>
<th>Payment and Compensation Schedule</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete First Online Survey</td>
<td>1 ballot</td>
</tr>
<tr>
<td>Read Message 1</td>
<td>1 ballot</td>
</tr>
<tr>
<td>Read Message 2</td>
<td>1 ballot</td>
</tr>
<tr>
<td>Read Message 3</td>
<td>1 ballot</td>
</tr>
<tr>
<td>Read Message 4</td>
<td>1 ballot</td>
</tr>
<tr>
<td>Complete Second Online Survey</td>
<td>$10 Gift Card</td>
</tr>
<tr>
<td>Complete Final Online Survey</td>
<td>$5 Gift Card</td>
</tr>
</tbody>
</table>

Please note: If you do not meet the eligibility criteria for this study and are routed to the exit screen, you will not receive any of the above compensation.

**Potential Harms, Risks, or Discomforts:**
There are no known risks to participation in this study.

**Potential Benefits**
As a participant, you can take pride in knowing that you are contributing to a novel study involving health messages for men. Through your involvement you are enabling a research study in which findings might have an important impact on future health promotion messaging techniques for men.

The scientific community and society may benefit by being able to expand its knowledge about effective health messages for men.
Confidentiality
Your answers are confidential. Your contact information will be stored in a password-protected file on a password-protected computer KHS 502. The data will be published on composite form with no ability to trace you as an individual. All records are secured safely under password protection and locked cabinets.

Participation and Withdrawal
Your participation is completely voluntary and you may withdraw from this study at any time without any consequences by merely exiting any of the surveys before pressing the "Next" button.

Information about the Study Results
We expect to have this study completed by August 2011. If you would like a brief summary of the results, please let us know how you would like it sent to you.

Questions or Concerns
If at any time you have further questions, problems, concerns, or would like to withdraw from the study, you can contact the project supervisor, Dr. Amy Latimer, amy.latimer@queensu.ca, (613) 533-6000 x 78773, Dr. Jean Côté, Director of the School of Kinesiology and Health Studies, SKHS.Director@queensu.ca, (613) 533-6601, or the Chair of the General Research Ethics Board, Dr. Joan Stevenson, chair.GREB@queensu.ca, (613) 533-6081

Subject Statement of Consent
I have read and understand the consent form for this study. I have been given sufficient time to consider the above information and to seek advice if I chose to do so.

I agree to being contacted via e-mail three times to complete the three online questionnaires. I also agree to being contacted via e-mail four times to read four different health messages.

If you understand and accept these conditions, please indicate your electronic consent to the by clicking on one of the following options:

- I consent to participate in this study
- I do not consent to participate in this study
Appendix I

Study 2 Eligibility Questionnaire (Day 1)

Thank you for consenting to participate in this study. Before you begin, please answer the following questions to ensure you are eligible to participate in this study.

1) Are you physically able to perform physical activity (e.g. do you have permission from your doctor to participate in physical activity)?
   - Yes
   - No

2) Are you male or female?
   - Male
   - Female

Canada's New Physical Activity Guidelines recommend:

Adults accumulate at least 150 minutes of moderate-to vigorous-intensity aerobic exercise per week in bouts of 10 minutes or more. It is also beneficial to add muscle strengthening exercises using major muscle groups at least 2 days per week. This is exercise that you do during your spare time and NOT something you have to do at work or around the house. Think about your exercise in terms of Canada's Physical Activity Guidelines.

3) Now, please tell me which of the following statements best describes you:
   - Yes, I have been doing the recommended amount of exercise EVERY week for MORE than 2 months.
   - No, I am not doing the recommended amount every week but I do exercise and I DO NOT intend to make any changes to my weekly exercise in the next 2 months
   - No, I am not doing the recommended amount every week but I do exercise and I intend to start increasing my weekly exercise in the next 2 months
   - No, I am not doing any exercise but I intend to begin doing exercise in the next 2 months
   - No, I am not doing the recommended amount of exercise and I DO NOT intend to increase my exercise in the next 2 months
   - None of these statements describe me

4) Please provide your e-mail address that you would like the researchers to contact you at throughout this study. Your contact information will be stored separately from your responses to the questionnaires in this study. Providing your e-mail address is a required field. Your e-mail address will ONLY be used so the researchers can contact you via e-mail to provide you with the links to the health messages and follow-up surveys.
Appendix J
Study 2 Baseline Questionnaire (Day 1)

Participant ID: In order to create your participant ID, please answer the following questions:

1) What are the first 3 letters of your mother’s maiden name? ____________
2) What are the last 4 digits of your home phone number? ____________

Please answer the following questions about yourself. All answers are strictly confidential.

1. What is your date of birth? Day:_______ Month:_________ Year:_____

2. In what city do you currently live? __________________

3. People living in Canada come from many different cultural and racial backgrounds. Which of the following backgrounds best describes you? You can check more than one option.
   - White
   - Aboriginal
   - Black
   - Asian
   - Other (please specify): ______________________________

4. What is your highest level of education?
   - Less than high school
   - High school
   - Some college (no degree)
   - College degree
   - Some university (no degree)
   - University – Bachelor-level degree (B.A., B.Sc., etc.)
   - University – Master-level degree (M.A., M.Sc., etc.)
   - University – Doctorate-level degree (Ph.D.)
   - University – Doctor of Medicine (M.D.)
   - University – Other

5. What is your marital status?
   - Single
According to Canada’s Physical Activity Guidelines, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more, and muscle strengthening activities at least two days per week. Please answer the following questions.

1. In the next two weeks, I intend to engage in the recommended amount of physical activity.

   1  2  3  4  5  6  7
   Strongly Disagree  Neutral  Strongly Agree

2. In the next two weeks, I will engage in the recommended amount of physical activity.

   1  2  3  4  5  6  7
   Strongly Disagree  Neutral  Strongly Agree

We are interested in finding out about the kinds of physical activities that you do as part of your everyday life. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the muscle strengthening exercises that you did in the last 7 days. Muscle strengthening exercises refer to activities that make your muscles work against gravity or weight.

1. During the last 7 days, on how many days did you do muscle strengthening exercises like lifting weights, sit ups, push ups, or squats?

   _____ days per week
No vigorous physical activities  ➔  Skip to question 3

2. How much time did you usually spend doing muscle strengthening exercises on one of those days? Please only report the time that you spent doing the exercises. Please do not include the time you spent between exercises.

____ hours per day
____ minutes per day
☐ Don’t know/Not sure

Think about all the moderate intensity aerobic activities that you did in the last 7 days. Moderate intensity aerobic activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate intensity aerobic activities like bicycling at a regular pace or doubles tennis? Do not include walking.

____ days per week
☐ No vigorous physical activities  ➔  Skip to question 5

4. How much time did you usually spend doing moderate intensity aerobic activities on one of those days?

____ hours per day
____ minutes per day
☐ Don’t know/Not sure

Think about all the vigorous intensity aerobic activities that you did in the last 7 days. Vigorous activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

5. During the last 7 days, on how many days did you do vigorous intensity aerobic activities like aerobics or fast bicycling?

____ days per week
No moderate physical activities  \( \rightarrow \)  *Skip to question 7*

6. How much time did you usually spend doing **vigorous** intensity aerobic activities on one of those days?

\[ \underline{____} \text{ hours per day} \]
\[ \underline{____} \text{ minutes per day} \]
\[ \square \text{ Don’t know/Not sure} \]
Appendix K
Risk and Efficacy Messages Based Upon the EPPM (Day 1-4)

DAY 1 – Erectile Dysfunction: Threat and Efficacy Messages

High Risk: Erectile Dysfunction

Men of all ages experience erectile dysfunction. Erectile dysfunction is one of the most common sexual disorders amongst men. In Canada, 1 in 10 men suffer from erectile dysfunction.

Risk factors for erectile dysfunction include physical inactivity, unhealthy eating, high blood pressure, smoking, drinking alcohol, and recreational drug use such as occasional marijuana use.

As a result, men suffering from erectile dysfunction are unable to engage in and perform regular sexual activities with their partners. Not being able to perform can be frustrating and embarrassing.

High Efficacy: Erectile Dysfunction and Physical Activity

However, men who meet Canada’s Physical Activity Guidelines are 30% less likely to develop erectile dysfunction compared to inactive men. Physical activity prevents erectile dysfunction by increasing your body’s ability to keep your arteries open, including the arteries in your penis, and promoting blood flow to your penis. Physical activity also strengthens your heart and improves your cardiovascular system which is crucial to getting and maintaining erections.
According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate-to-vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week. Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight. For example, here is some information about moderate-intensity aerobic activities:

<table>
<thead>
<tr>
<th>What Do Moderate-Intensity Aerobic Activities Feel Like?</th>
<th>Examples of Moderate-Intensity Aerobic Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You’re working hard enough to raise your heart rate and break a sweat</td>
<td>• Brisk walking or hiking</td>
</tr>
<tr>
<td>• You’ll be able to talk, but not sing the words to your favorite song</td>
<td>• Bicycling</td>
</tr>
<tr>
<td></td>
<td>• Pushing a lawn mower</td>
</tr>
<tr>
<td></td>
<td>• Golfing</td>
</tr>
</tbody>
</table>

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. However, there are some ways to make incorporating physical activity into your day easier. First, you can accumulate physical activity in bouts of 10 minutes or more. It also helps to be prepared and plan ahead. Brainstorm different types of physical activities that you like to do and make a schedule for your exercises.

If you have a busy schedule and are looking for ways to incorporate small bouts of physical activity into your day, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
</table>

Check back tomorrow for a physical activity plan for working out at the gym!

_This information was provided by the following reputable sources: The International Journal of Impotence Research and the Canadian Society for Exercise Physiology._

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Low Efficacy: Erectile Dysfunction and Physical Activity

However, by engaging in regular physical activity, there is a chance that you may reduce your risk of developing erectile dysfunction.

According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate-to vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week.

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight.

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. Make sure to be prepared and brainstorm different types of physical activities to perform.

Moderate-intensity aerobic activity means you're working hard enough to raise your heart rate and break a sweat. One way to tell is that you'll be able to talk, but not sing the words to your favorite song. Here are some moderate-intensity aerobic physical activities that you could perform:

- Brisk walking
- Bicycling

Check back tomorrow for information about vigorous-intensity aerobic activities!

DAY 2 – Heart Disease and Type II Diabetes: Threat and Efficacy Messages

High Risk: Heart Disease and Type II Diabetes

Type 2 Diabetes is one of the fastest growing diseases among men in Canada. In Eastern and Southeastern Ontario, which includes Ottawa, Kingston, and the Hastings and Prince Edward Counties, 1 in 12 men have Type 2 Diabetes.

(GTA Messages: Type 2 Diabetes is one of the fastest growing diseases in Canada. In the Greater Toronto Area alone, up to 1 in 13 men have Type 2 Diabetes.)
(Halifax Messages: Type 2 Diabetes is one of the fastest growing diseases in Canada. In Halifax and the surrounding area alone, 1 in 13 men have Type 2 Diabetes.)

(Vancouver Messages: Type 2 Diabetes is one of the fastest growing diseases in Canada. In Vancouver and the surrounding area alone, 1 in 25 men have Type 2 Diabetes.)

Risk factors for Type 2 Diabetes include unhealthy eating, physical inactivity, smoking, high blood pressure, and high cholesterol. Type 2 Diabetes can result in many complications including:

- Erectile dysfunction that leads to problems with sexual performance
- Heart disease that could lead to heart attacks
- Kidney problems that could cause your kidneys to stop working
- Nerve damage that can cause loss of feeling
- Blindness and amputations that could lead to your loss of independence

As a result, people who have Type 2 Diabetes between the ages of 20 and 44 years are 4 to 6 times more likely to die compared to healthy people in the same age class. Men living with Type 2 Diabetes between the ages of 20 to 39 years have an 8 year shorter life expectancy compared healthy men in the same age class.

Heart disease is also a serious health concern for Canadian men. Heart disease is one of the leading causes of death amongst Canadian men. Every 7 minutes, a Canadian dies from heart disease. 1 in 3 Canadian men will die from heart disease.

Nine out of 10 Canadians have at least one risk factor for heart disease. Risk factors include unhealthy eating, smoking, drinking alcohol, physical inactivity, high blood pressure, high blood cholesterol, and diabetes.

High Efficacy: Heart Disease, Type II Diabetes, and Physical Activity

However, men who meet Canada’s Physical Activity Guidelines are 60% less likely to develop Type 2 Diabetes compared to men who do not meet the guidelines. Physical
activity prevents Type 2 Diabetes by improving your muscles' ability to take in glucose, or sugar, from your blood. Therefore, physical activity helps to control your blood glucose levels - the key problem of Type 2 Diabetes.

Men who meet Canada’s Physical Activity Guidelines are also less likely to develop heart disease and are half as likely to experience a heart attack compared to inactive men. Physical activity prevents heart disease by controlling your blood pressure and blood cholesterol levels, reducing your stress levels, and increasing your energy.

To achieve health benefits, men should meet or exceed Canada’s Physical Activity Guidelines:

- 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week
- Muscle and bone strengthening activities 2 days per week

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight. For example, here is some information about vigorous-intensity aerobic activities:

<table>
<thead>
<tr>
<th>What Do Vigorous-Intensity Aerobic Activities Feel Like?</th>
<th>Examples of Vigorous-Intensity Aerobic Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>You’re breathing hard and fast, and your heart rate has gone up quite a bit</td>
<td>Jogging</td>
</tr>
<tr>
<td>You won’t be able to say more than a few words without pausing for a breath</td>
<td>Cross-country skiing</td>
</tr>
<tr>
<td></td>
<td>Sports such as squash and hockey</td>
</tr>
<tr>
<td></td>
<td>Kickboxing</td>
</tr>
</tbody>
</table>

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. However, there are some ways to help fit physical activity into your day. First, you can add up physical activity in bouts of 10 minutes or more. It also helps to be prepared and plan ahead. Brainstorm different types of physical activities that you like to do and make a schedule for your exercises

If you like to work out at the gym, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule.
Check back tomorrow for a physical activity plan for performing sports in recreational community leagues!

*This information was provided by the following reputable sources: Statistics Canada, the Public Health Agency of Canada, the Heart and Stroke Foundation of Canada, the Canadian Diabetes Association, and the Canadian Society for Exercise Physiology.*

### Low Efficacy: Heart Disease, Type II Diabetes, and Physical Activity

However, by engaging in regular physical activity, there is a chance that you may reduce your risk of developing Type 2 Diabetes and heart disease.

According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate-to-vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week.

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight.

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. Make sure to be prepared and brainstorm different types of physical activities to perform.

Vigorous-intensity aerobic activity means you're breathing hard and fast, and your heart rate has gone up quite a bit. If you're working at this level, you won't be able to say more than a few words without pausing for a breath. Here are some vigorous-intensity aerobic physical activities that you could perform:

- Jogging
- Cross-country skiing

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<td><strong>Where:</strong> Gym</td>
<td><strong>Where:</strong> Gym</td>
<td><strong>Where:</strong> Gym</td>
<td><strong>Where:</strong> Gym</td>
<td><strong>Where:</strong> Gym</td>
</tr>
<tr>
<td><strong>What:</strong> Run on treadmill (30min) and bike (20min)</td>
<td><strong>What:</strong> Upper and lower body strength training (30min)</td>
<td><strong>What:</strong> Run on treadmill (30min) and bike (20min)</td>
<td><strong>What:</strong> Upper and lower body strength training (30min)</td>
<td><strong>What:</strong> Run on treadmill (30min) and bike (20min)</td>
<td><strong>What:</strong> Run on treadmill (30min) and bike (20min)</td>
<td><strong>What:</strong> Run on treadmill (30min) and bike (20min)</td>
</tr>
</tbody>
</table>
Check back tomorrow for information about muscle strengthening activities for your upper body!

**DAY 3 – Overweight and Obesity: Threat and Efficacy Messages**

**High Risk: Overweight and Obesity**

In **Eastern and Southeastern Ontario**, which includes Ottawa, Kingston, and the Hastings and Prince Edward Counties, up to 2 of 3 men are overweight or obese. **Men over the age of 18 years** are more likely to become overweight or obese than younger men.

*(GTA Message: In the Greater Toronto Area alone, up to 3 of 5 men are overweight or obese. **Men over the age of 18 years** are more likely to become overweight or obese than younger men.)*

*(Halifax Message: In Halifax and the surrounding area alone, 2 of 3 men are overweight or obese. **Men over the age of 18 years** are more likely to become overweight or obese than younger men.)*

*(Vancouver Message: In Vancouver and the surrounding area alone, up to 3 of 5 men are overweight or obese. **Men over the age of 18 years** are more likely to become overweight or obese than younger men.)*

Obesity is a **risk factor for many chronic conditions**, including heart disease, Type 2 Diabetes, stroke, increased blood pressure, and problems with your sexual performance. Obesity also **increases your risk** of developing physical disabilities, such as joint pain, difficulty walking and moving around, and difficulty performing everyday tasks.

Overweight and obese men are **35% more likely** to develop colon, rectal, and prostate cancers compared to men with healthy body weights.
Obesity is a **serious and life-threatening** condition. Obesity can **decrease** a man's life expectancy by **7 years**.

**High Efficacy: Overweight, Obesity, and Physical Activity**

However, overweight and obesity **can be prevented** by improving your lifestyle behaviours. Engaging in muscle strengthening activities builds lean muscle which helps you burn calories. Performing aerobic physical activities also helps you burn calories. Therefore, **engaging in regular physical activity has been shown to be an effective method** of managing body weight and decreasing the risk of overweight and obesity.

To achieve health benefits, men should meet or exceed Canada’s Physical Activity Guidelines:

- 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week
- Muscle and bone strengthening activities 2 days per week

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight. For example, here is some information about muscle strengthening activities for your upper body:

<table>
<thead>
<tr>
<th>What Are the Major Muscle Groups in My Upper Body?</th>
<th>Examples of Upper Body Muscle Strengthening Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Arms</td>
<td>• Push Ups</td>
</tr>
<tr>
<td>• Shoulders</td>
<td>• Yard Work (e.g. digging, shoveling)</td>
</tr>
<tr>
<td>• Upper Back</td>
<td>• Lifting Weights (e.g. bicep curls, chest press)</td>
</tr>
<tr>
<td>• Chest</td>
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</tbody>
</table>

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. However, there are some ways to make incorporating physical activity into your day easier. First, you can accumulate physical activity in bouts of 10 minutes or more. It also helps to be prepared and plan ahead. Brainstorm different types of physical activities that you like to do and make a schedule for your exercises.

If you like to take part in sports, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule.
Low Efficacy: Overweight, Obesity, and Physical Activity

However, becoming overweight and obese may be prevented by engaging in regular physical activity.

According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate-to-vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week.

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight.

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. Make sure to be prepared and brainstorm different types of physical activities to perform.

Major muscle groups in your upper body include your arms, shoulders, upper back, and chest. There are many ways you can strengthen these muscles. Here are some examples of upper body muscle strengthening activities:

• Push ups
• Gardening

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<td>When: 9pm</td>
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<tr>
<td>Where: Community recreational hockey rink</td>
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<td>Community recreational hockey rink</td>
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<td>Community recreational hockey rink</td>
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<tr>
<td>What: Play hockey in community league (50min)</td>
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<td>What: Play hockey in community league (5min)</td>
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</tbody>
</table>

Check back tomorrow for a physical activity plan for working out at home!

This information was provided by the following reputable sources: Statistics Canada, the Public Health Agency of Canada, Obesity Canada, and the Canadian Society for Exercise Physiology.
• Lifting weights

Check back tomorrow for information about muscle strengthening activities for your lower body!

**DAY 4 – Sexual Performance: Threat and Efficacy Messages**

**High Risk: Sexual Performance**

**Men of all ages** experience problems with their sexual performance. The risk factors that increase your chances for problems with sexual performance include unhealthy behaviours, such as physical inactivity, unhealthy eating, smoking, and drinking alcohol. Men experiencing impaired sexual functioning do not engage in regular sexual activities with their partners.

1 in 4 men will experience a **low sex drive or lack of desire** to have sex. As a result, men suffering from impaired sexual functioning experience **sexual dissatisfaction** and **perform poorly in bed**.

**High Efficacy: Sexual Performance and Physical Activity**

However, men who meet Canada’s Physical Activity Guidelines are **more likely to be sexually satisfied** compared to inactive men. Physically active men are **more likely to enjoy and perform regular sexual activities** with their partners compared to men who are inactive.

Physical activity **enhances your sex drive and sex life** by increasing your endurance and stamina. Physical activity also **strengthens your heart** and improves your cardiovascular system which improves your blood flow throughout your body. This is crucial to getting and maintaining erections.
To achieve health benefits, men should meet or exceed Canada’s Physical Activity Guidelines:

- 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week
- Muscle and bone strengthening activities 2 days per week

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight. For example, here is some information about muscle strengthening activities for your lower body:

<table>
<thead>
<tr>
<th>What Are the Major Muscle Groups in My Lower Body?</th>
<th>Examples of Lower Body Muscle Strengthening Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Abdomen</td>
<td>• Sit Ups</td>
</tr>
<tr>
<td>• Hips</td>
<td>• Squats</td>
</tr>
<tr>
<td>• Legs</td>
<td>• Weight training (e.g. leg lifts, curls, and extensions)</td>
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<tr>
<td>• Lower Back</td>
<td></td>
</tr>
</tbody>
</table>

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. However, there are some ways to make incorporating physical activity into your day easier. First, you can accumulate physical activity in bouts of 10 minutes or more. It also helps to be prepared and plan ahead. Brainstorm different types of physical activities that you like to do and make a schedule for your exercises.

If you like to perform physical activity at home, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule.

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<th>Monday</th>
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<tbody>
<tr>
<td>When: 7pm Where: Home What: Brisk Walk around the neighbourhood with your partner, children, and/or pets (50min)</td>
<td>When: 7pm Where: Home What: Upper and lower body strength training (30min)</td>
<td>When: 7pm Where: Home What: Go for a bike ride around the neighbourhood with your partner, children, and/or pets (30min)</td>
<td>When: 7pm Where: Home What: Upper and lower body strength training (30min)</td>
<td></td>
<td></td>
<td>When: 1pm Where: Home What: Do yard work – rake leaves or shovel the driveway (50min)</td>
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</tbody>
</table>

Check back tomorrow for a physical activity plan for performing sports in recreational community leagues!
This information was provided by the following reputable sources: The Journal of Sexual Medicine, the International Journal of Impotence Research, and the Canadian Society for Exercise Physiology.

Low Efficacy: Sexual Performance and Physical Activity

However, by engaging in regular physical activity, there is a chance that you may reduce your risk of experiencing problems with your sexual performance.

According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate-to-vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week.

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles work against gravity or weight.

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. Make sure to be prepared and brainstorm different types of physical activities to perform.

Major muscle groups in your lower body include your abdomen, hips, legs, and lower back. There are many ways you can strengthen these muscles. Here are some examples of lower body muscle strengthening activities:

- Sit Ups
- Squats
- Leg lifts in a Chair
Appendix L

Study 2 Post-Message Questionnaire (Day 1-4)

Based upon the information I have received about [insert condition*], I currently feel:

1. Frightened

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<td>Strongly Disagree</td>
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2. Scared

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<td>Strongly Disagree</td>
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3. Anxious

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<td>Strongly Disagree</td>
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4. When I read the information about [insert condition*], my first instinct was to:
   - □ Want to think about [insert condition*]
   - □ Not want to think about [insert condition*]

5. When I read the information about [insert condition*], my first instinct was to:
   - □ Want to do something to keep myself from developing [insert condition*]
   - □ Not want to do something to keep myself from developing [insert condition*]

*Note: Conditions targeted were as follows:
- Day 1: Erectile dysfunction
- Day 2: Chronic conditions (e.g. heart disease and Type II Diabetes)
- Day 3: Overweight and obesity
- Day 4: Problems with sexual performance
Appendix M

Study 2 First Follow-Up Questionnaire (Day 5)

Participant ID: Please answer the following questions so we can match your responses to this questionnaire with your responses to the previous questionnaire.

1. What are the first 3 letters of your mother’s maiden name? ____________
2. What are the last 4 digits of your home phone number? ____________

Please answer the following questions.

1. You have read four different health messages. What are the key ideas or details that you remember from these messages?

2. Which of the four health messages was your most favourite?
   - Erectile Dysfunction and Physical Activity
   - Heart Disease, Type II Diabetes, and Physical Activity
   - Overweight, Obesity, and Physical Activity
   - Sexual Performance and Physical Activity

3. Which of the four health messages was your least favourite?
   - Erectile Dysfunction and Physical Activity
   - Heart Disease, Type II Diabetes, and Physical Activity
   - Overweight, Obesity, and Physical Activity
   - Sexual Performance and Physical Activity

According to Canada’s Physical Activity Guidelines, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more, and muscle strengthening activities at least two days per week. Please answer the following questions.

1. In the next two weeks, I intend to engage in the recommended amount of physical activity.

   1 Strongly Disagree
   2 Neutral
   3 Strongly Agree

   4
   5
   6
   7

167
2. In the next two weeks, I will engage in the recommended amount of physical activity.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

According to Canada’s Physical Activity Guidelines, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more, and muscle strengthening activities at least two days per week.

Imagine you had all of the resources you needed to perform the recommended amount of physical activity. With this in mind, please answer the following questions.

6. I am physically able to engage in the recommended amount of physical activity over the next two weeks.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

7. I have the physical ability to engage in the recommended amount of physical activity over the next two weeks.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

8. I can easily engage in the recommended amount of physical activity over the next two weeks.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

Now think about the logistics of scheduling the recommended amount of physical activity into your weekly schedule. Please indicate how confident you are that you can complete the recommended amount of physical activity each week over the next two weeks.
Over the next two weeks, I am confident that I can:

9. Reach the recommended amount of physical activity each week no matter what.

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10. Plan the recommended amount of physical activity so it fits with my daily activities.

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11. Arrange my schedule to meet the recommended amount of physical activity each week.

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Please answer the following questions.

12. I believe that obesity is a severe condition.

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<tr>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
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13. I believe that erectile dysfunction is a severe condition.

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<td>Strongly Disagree</td>
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14. I believe that chronic diseases including heart disease and type II diabetes are severe conditions.

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<td>Strongly Disagree</td>
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<td>Strongly Agree</td>
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</table>
15. I believe that problems with sexual performance is a severe condition.

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<td>Strongly Disagree</td>
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Please answer the following questions.

16. I am at risk for becoming obese.

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<tr>
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<td>Strongly Disagree</td>
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<td>Strongly Agree</td>
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</table>

17. I am at risk for developing erectile dysfunction.

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<td>Strongly Disagree</td>
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<td>Strongly Agree</td>
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18. I am at risk for developing chronic diseases including heart disease and type II diabetes.

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<td>Strongly Agree</td>
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19. I am at risk for developing problems with my sexual performance.

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Canada’s Physical Activity Guidelines state that to achieve health benefits, individuals should engage in at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week and strength training two days per week. Based on this information, please answer the following questions.
20. If I engage in the recommended amount of physical activity, I will decrease my risk of becoming obese.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

21. If I engage in the recommended amount of physical activity, I will decrease my risk of developing erectile dysfunction.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

22. If I engage in the recommended amount of physical activity, I will decrease my risk of developing chronic diseases such as heart disease and type II diabetes.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

23. If I engage in the recommended amount of physical activity, I will decrease my risk of developing problems with my sexual performance.

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

I believe that the provided health messages were:

24. Manipulative

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree

25. Misleading

1 2 3 4 5 6 7
Strongly Disagree Neutral Strongly Agree
Please answer the following questions by rating your answer on a scale from 1 (strongly disagree) to 7 (strongly agree).

1. Success in his work has to be a man’s central goal in life.
   
   \[
   \begin{array}{ccccccc}
   & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   \text{Strongly Disagree} & \text{Neutral} & \text{Strongly Agree}
   \end{array}
   \]

2. The best way for a young man to get the respect of other people is to get a job, take it seriously, and do it well.
   
   \[
   \begin{array}{ccccccc}
   & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   \text{Strongly Disagree} & \text{Neutral} & \text{Strongly Agree}
   \end{array}
   \]

3. A man owes it to his family to work at the best-paying job he can get.
   
   \[
   \begin{array}{ccccccc}
   & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   \text{Strongly Disagree} & \text{Neutral} & \text{Strongly Agree}
   \end{array}
   \]

4. A man should generally work overtime to make more money whenever he has the chance.
   
   \[
   \begin{array}{ccccccc}
   & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   \text{Strongly Disagree} & \text{Neutral} & \text{Strongly Agree}
   \end{array}
   \]

5. A man always deserves the respect of his wife and children.
   
   \[
   \begin{array}{ccccccc}
   & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
   \text{Strongly Disagree} & \text{Neutral} & \text{Strongly Agree}
   \end{array}
   \]
6. It is essential for a man to always have the respect and admiration of everyone who knows him.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree

7. A man should never back down in the face of trouble.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree

8. A man should be totally sure of himself.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree

9. A man should always think everything out coolly and logically, and have rational reasons for everything he does.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree

10. A man should always try to project an air of confidence even if he doesn’t really feel confident inside.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree

11. A man must stand on his own two feet and never depend on other people to help him do things.

1 Strongly Disagree  2 3 4 5 6 7 Strongly Agree
12. When a man is feeling a little pain he should try not to let it show very much.

<table>
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<tr>
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<th>4</th>
<th>5</th>
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<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
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</tbody>
</table>

13. Nobody respects a man very much who frequently talks about his worries, fears, and problems.

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<th>7</th>
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<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
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</table>

14. A good motto for a man would be “When the going gets tough, the tough get going”.

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</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

15. A young man should try to become physically tough, even if he’s not big.

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<thead>
<tr>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
<td></td>
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</tbody>
</table>

16. Fists are sometimes the only way to get out of a bad situation.

<table>
<thead>
<tr>
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<th>4</th>
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<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
<td></td>
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</table>

17. A real man enjoys a bit of danger now and then.

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<tr>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
18. In some kinds of situations a man should be ready to use his fists, even if his wife or girlfriend would object.

Strongly Disagree 2 3 4 5 6 7 Strongly Agree
Neutral

19. A man should always refuse to get into a fight, even if there seems no way to avoid it.

Strongly Disagree 2 3 4 5 6 7 Strongly Agree
Neutral
Appendix N

Study 2 Two-Week Follow-Up Questionnaire (Day 14)

Participant ID: Please answer the following questions so we can match your responses to this questionnaire with your responses to the previous two questionnaires.

1. What are the first 3 letters of your mother’s maiden name? ____________
2. What are the last 4 digits of your home phone number? ____________

We are interested in finding out about the kinds of physical activities that you do as part of your everyday life. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the muscle strengthening exercises that you did in the last 7 days. Muscle strengthening exercises refer to activities that make your muscles work against gravity or weight.

1. During the last 7 days, on how many days did you do muscle strengthening exercises like lifting weights, sit ups, push ups, or squats?

   ______ days per week

   □ No vigorous physical activities

   → Skip to question 3

2. How much time did you usually spend doing muscle strengthening exercises on one of those days? Please only report the time that you spent doing the exercises. Please do not include the time you spent between exercises.

   ______ hours per day
   ______ minutes per day

   □ Don’t know/Not sure

Think about all the moderate intensity aerobic activities that you did in the last 7 days. Moderate intensity aerobic activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.
3. During the **last 7 days**, on how many days did you do **moderate** intensity aerobic activities like bicycling at a regular pace or doubles tennis? Do not include walking.

   _____ days per week

   [ ] No vigorous physical activities ➞ **Skip to question 5**

4. How much time did you usually spend doing **moderate** intensity aerobic activities on one of those days?

   _____ hours per day
   _____ minutes per day

   [ ] Don’t know/Not sure

Think about all the **vigorous** intensity aerobic activities that you did in the **last 7 days**. **Vigorous** activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for **at least 10 minutes at a time**.

5. During the **last 7 days**, on how many days did you do **vigorous** intensity aerobic activities like aerobics or fast bicycling?

   _____ days per week

   [ ] No moderate physical activities ➞ **Skip to question 7**

6. How much time did you usually spend doing **vigorous** intensity aerobic activities on one of those days?

   _____ hours per day
   _____ minutes per day

   [ ] Don’t know/Not sure
Appendix O
Study 2 Debriefing Form

Thank You For Participating!

The data you have provided are truly invaluable. The following form discusses the concept of the study in which you have just participated. This information will also be emailed to all participants in the study.

Purpose of the Study
To determine whether messages with risk and efficacy information influence men's intentions and physical activity behaviours.

What Role Did Fear Appeals Play in This Study?
The health messages that you read were either a risk message or a no risk message. The health messages that you read were also either a high efficacy or a low efficacy physical activity message. The researchers want to see if the way the message is written changes whether men have greater intentions and physical activity behaviours over time.

Want to Learn More?
If you have questions regarding the study feel free to contact the researcher (6ah12@queensu.ca) or use the following resources.

Physical Activity Information
It is important that you are informed about Canada's new physical activity guidelines that were released in January 2011. We have provided you with the reputable website about Canada’s Physical Activity Guidelines below. Please also take the time to read the alternate message about the benefits of physical activity.

Reputable Websites:
http://www.csep.ca/english/view.asp?x=804

Alternate Messages about the Benefits of Physical Activity:

Physical Activity and Erectile Dysfunction
Men who meet Canada’s Physical Activity Guidelines are 30% less likely to develop erectile dysfunction compared to inactive men. Physical activity prevents erectile dysfunction by increasing your body's ability to keep your arteries open, including the arteries in your penis, and promoting blood flow to your penis. Physical activity also
strengthens your heart and improves your cardiovascular system which is crucial to getting and maintaining erections.

Physical Activity and Type 2 Diabetes
Men who meet Canada’s Physical Activity Guidelines are 60% less likely to develop Type 2 Diabetes compared to inactive men. Physical activity prevents Type 2 Diabetes by improving your muscles’ ability to take in glucose, or sugar, from your blood. Therefore, physical activity helps to control your blood glucose levels - the key problem of Type 2 Diabetes.

Physical Activity and Heart Disease
Men who meet Canada’s Physical Activity Guidelines are also less likely to develop heart disease and are half as likely to experience a heart attack compared to inactive men. Physical activity prevents heart disease by controlling your blood pressure and blood cholesterol levels, reducing your stress levels, and increasing your energy.

Physical Activity and Obesity
Overweight and obesity can be prevented by improving your lifestyle behaviours. Engaging in muscle strengthening activities builds lean muscle which helps you burn calories. Performing aerobic physical activities also helps you burn calories. Therefore, engaging in regular physical activity has been shown to be an effective method of managing body weight and decreasing the risk of overweight and obesity.

Physical Activity and Sexual Performance
Men who meet Canada’s Physical Activity Guidelines are more likely to be sexually satisfied compared to inactive men. Physically active men are more likely to enjoy and perform regular sexual activities with their partners compared to men who are inactive.

Physical activity enhances your sex drive and sex life by increasing your endurance and stamina. Physical activity also strengthens your heart and improves your cardiovascular system which improves your blood flow throughout your body. This is crucial to getting and maintaining erections.

Canada's Physical Activity Guidelines
According to Canada’s Physical Activity Guidelines for adults, in order to achieve health benefits, adults should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week. Adults should also perform muscle and bone strengthening activities using major muscle groups at least 2 days per week.

Aerobic activities involve large muscle groups for long periods. These activities will cause you to sweat and be out of breath. Strengthening activities make your muscles
work against gravity or weight. For example, here is some information about aerobic activities and muscle strengthening activities.

**Moderate-Intensity Aerobic Activities**

<table>
<thead>
<tr>
<th>What Do Moderate-Intensity Aerobic Activities Feel Like?</th>
<th>Examples of Moderate-Intensity Aerobic Activities</th>
</tr>
</thead>
</table>
| • You’re working hard enough to raise your heart rate and break a sweat  
  • You’ll be able to talk, but not sing the words to your favorite song | • Brisk walking or hiking  
  • Bicycling  
  • Pushing a lawn mower  
  • Golfing |

**Vigorous-Intensity Aerobic Activities**

<table>
<thead>
<tr>
<th>What Do Vigorous-Intensity Aerobic Activities Feel Like?</th>
<th>Examples of Vigorous-Intensity Aerobic Activities</th>
</tr>
</thead>
</table>
| • You’re breathing hard and fast, and your heart rate has gone up quite a bit  
  • You won’t be able to say more than a few words without pausing for a breath | • Jogging  
  • Cross-country skiing  
  • Sports such as squash and hockey  
  • Kickboxing |

**Muscle Strengthening Activities for Your Upper Body**

<table>
<thead>
<tr>
<th>What Are the Major Muscle Groups in My Upper Body?</th>
<th>Examples of Upper Body Muscle Strengthening Activities</th>
</tr>
</thead>
</table>
| • Arms  
  • Shoulders  
  • Upper Back  
  • Chest | • Push Ups  
  • Yard Work (e.g. digging, shoveling)  
  • Lifting Weights (e.g. bicep curls, chest press) |

**Muscle Strengthening Activities for Your Lower Body**

<table>
<thead>
<tr>
<th>What Are the Major Muscle Groups in My Lower Body?</th>
<th>Examples of Lower Body Muscle Strengthening Activities</th>
</tr>
</thead>
</table>
| • Abdomen  
  • Hips  
  • Legs  
  • Lower Back | • Sit Ups  
  • Squats  
  • Weight training (e.g. leg lifts, curls, and extensions) |

Meeting Canada’s Physical Activity Guidelines is a large time commitment and at times may be difficult to complete. However, there are some ways to help fit physical activity into your day. First, you can add up physical activity in bouts of 10 minutes or more. It also helps to be prepared and plan ahead. Brainstorm different types of physical activities that you like to do and make a schedule for your exercises.
Physical Activity Plan for a Busy Schedule
If you have a busy schedule and are looking for ways to incorporate small bouts of physical activity into your day, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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<tbody>
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<td><strong>When:</strong> Noon</td>
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<tr>
<td><strong>Where:</strong> Outside at</td>
<td><strong>Where:</strong> Work</td>
<td><strong>Where:</strong> Home</td>
<td><strong>Where:</strong> Work</td>
<td><strong>Where:</strong> Home</td>
<td><strong>Where:</strong> Home</td>
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<td>Work</td>
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<tr>
<td>during lunch</td>
<td>lower body</td>
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<td>during lunch</td>
</tr>
<tr>
<td>hour (50min)</td>
<td>strength</td>
<td>hour with co-worker</td>
<td>strength</td>
<td>strength</td>
<td>hour (50min)</td>
<td>hour (50min)</td>
</tr>
<tr>
<td></td>
<td>training</td>
<td>(50min)</td>
<td>training</td>
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<td>(15min each)</td>
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Physical Activity Plan for the Gym
If you like to work out at the gym, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule:

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<th>Sunday</th>
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<tbody>
<tr>
<td><strong>When:</strong> Noon</td>
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<td><strong>Where:</strong> Gym</td>
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<td>on treadmill (30min)</td>
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Physical Activity Plan for Recreational Sports
If you like to take part in sports, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plan to better suit your schedule:
Physical Activity Plan for Home

If you like to perform physical activity at home, here is a potential physical activity plan that you could put into action. This is just an example. You may need to adjust this plans to better suit your schedule:

<table>
<thead>
<tr>
<th>Monday</th>
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<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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<th>Sunday</th>
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