The effectiveness of a health versus appearance message on pregnant women's intentions to exercise postpartum: The moderating role of self-monitoring

Anca Gaston

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ABSTRACT

Despite the confirmed health benefits of exercise during the postpartum period, many new mothers are not sufficiently active. The present research aimed to examine the effectiveness of 2 types of messages on intention to exercise after giving birth on 2 groups of pregnant women (low and high self-monitors) using the Theory of Planned Behavior as a theoretical basis. Participants were 218 pregnant women 18 years of age and older (Mean age = 27.9 years, SD = 5.47), and in their second or third trimester. Women completed a demographics questionnaire, a self-monitoring (SM) scale and the Godin Leisure Time Exercise Questionnaire for current and pre-pregnancy exercise levels. They then read one of two brochures, describing either the health or appearance benefits of exercise for postpartum women. Women's attitudes, social norms, perceived behavioral control, and intentions to exercise postpartum were then assessed to determine whether one type of message (health or appearance) was more effective for each group. A MANOVA found no significant effect (p>0.05) for message type, SM, or their interaction. Possible reasons include the fact that the two messages may have been too similar, reading any message about exercise may result in intentions to exercise, or lack of attention given to the brochure. Given the lack of research in this area, more studies are necessary to confirm the present results.

Two additional exploratory analyses were conducted. Pearson correlations found higher levels of pre-pregnancy exercise and current exercise to be associated with more positive attitudes, more positive subjective norms, higher perceived behavioral control, and higher intention to exercise postpartum. A hierarchical regression was conducted to determine the predictive utility of attitudes, subjective norms, and perceived behavioral
control on intention for each self-monitoring group. Results of the analysis demonstrated the three independent variables significantly predicted intention ($p < .001$) in both groups, accounting for 58-62% of the variance in intention. For low self-monitors, attitude was the strongest predictor of intention, followed by perceived behavioral control and subjective norm. For high self-monitors, perceived behavioral control was the strongest predictors, followed by attitudes and subjective norm. The present study has practical and real world implications by contributing to our understanding of what types of messages, in a brochure format, are most effective in changing pregnant women’s attitudes, subjective norm, perceived behavioral control and intention to exercise postpartum and provides further support for the use of the Theory of Planned Behavior with this population.

Key words: Pregnancy, postpartum, exercise, self-monitoring, Theory of Planned Behavior.
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<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERTIFICATE OF APPROVAL</td>
</tr>
<tr>
<td>TITLE PAGE</td>
</tr>
<tr>
<td>ABSTRACT</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
</tr>
</tbody>
</table>

**CHAPTER ONE – LITERATURE REVIEW**

1.1 Introduction

1.2 Benefits of physical activity in the general population

1.3 Benefits of physical activity during pregnancy

1.4 Physical activity patterns of pregnant women

1.5 Physical activity recommendations for pregnant women

1.6 Predictors of physical activity during pregnancy

1.7 Barriers to exercise during pregnancy

1.8 Benefits of exercise during the postpartum period

1.9 Health benefits of exercise during the postpartum period
   1.9.1 Aerobic fitness and muscular strength
   1.9.2 Bone content and bone mass density
   1.9.3 Lipoprotein profile and insulin sensitivity
   1.9.4 Mental stress and postpartum depression
   1.9.5 Exercise and impact on breast milk
   1.9.6 Influence of postpartum exercise on offspring physical activity

1.10 Appearance benefits of exercise during the postpartum period
CHAPTER 4: RESULTS

4.1 Self-monitoring

4.2 Manipulation check

4.3 Treatment of missing data

4.4 Outliers

4.5 Normality of sampling distribution: skewness and kurtosis

4.6 Linearity

4.7 Homogeneity of variance

4.8 Multicollinearity

4.9 Descriptive statistics

4.10 Hypothesis testing

4.10.1 Research question 1

4.10.2 Research question 2

4.10.3 Research question 3

4.11 Exploratory analyses: Influence of previous pregnancies

4.11.1 Exploratory analysis 1

4.11.2 Exploratory analysis 2

4.11.3 Exploratory analysis 3

CHAPTER FIVE: DISCUSSION

5.1 Descriptive statistics

5.2 Effectiveness of a health versus appearance brochure and the moderating role of self-monitoring
5.3 Explanations for lack of effect for message type, SM, or their interaction 75

5.3.1 Lack of effect for message type 75

5.3.2 Lack of moderating effect for self-monitoring status 77

5.4 Relationship of past and current physical activity on attitudes, subjective norms, perceived behavioral control and intention 79

5.5 Contribution of pre-pregnancy physical activity, attitudes, subjective norm and perceived behavioral control to the prediction of intention 80

5.6 Limitations 84

5.7 Future directions 87

5.8 Implications 90

5.8.1 Implications for practice 90

5.8.2 Implications for research 91

5.9 Conclusion 92

REFERENCES 94

Appendix A: Ethics clearance 113

Appendix B: Letter of Invitation 116

Appendix C: Letter of informed consent 118

Appendix D: Demographics questionnaire 121

Appendix E: Self-monitoring measure 123

Appendix F: Pre-pregnancy GLTEQ 125

Appendix G: Current GLTEQ 127

Appendix H: Health brochure 129

Appendix I: Appearance brochure 132
Appendix J: Theory of Planned Behavior questionnaire
Appendix K: Debriefing form
CHAPTER ONE: LITERATURE REVIEW

1.1 Introduction

Every year, there are approximately 330,000 births in Canada (Statistics Canada, 2005). Although the Canadian economy continues to rely mainly on immigration for its population growth, births continue to account for approximately one-third of the annual population increase (Statistics Canada, 2005). While 2.1 births per woman would compensate for the annual death rate and result in a zero-growth population rate, without immigration Canada’s current birth rate of 1.5 children per woman would put the country in danger of a negative growth rate. Given the importance of a vital and healthy Canadian population, government officials are beginning to suggest financial incentives that might encourage families to have more children. For example, Diane Finley, former human resources minister, issued a 10-point list of recommendations in January of 2006. Among them, she suggested extending Employment Insurance benefits from 50 weeks to 18 months, increasing child care expense deductions, and extending parental leave to both parents and grandparents (George, 2007).

Furthermore, not only are women having fewer children, but they are waiting longer before starting their families. According to Statistics Canada (2005), women in their 30's accounted for 48% of births to first-time mothers in 2003, compared to only 14% of births to first time mothers in 1983. The risks for several congenital abnormalities, including Down Syndrome and Autism are associated with maternal age over 35. In addition, women over the age of 35 are at greater risk for gestational diabetes, placental abruption and even stroke (Gerard, 2000). As fewer babies are born in Canada
each year, and a larger percentage of the births are attributed to older mothers, the need for healthy mothers and babies is highlighted even more.

Given these factors, the health of Canadian mothers and babies is a high priority. Fortunately, there are many things that women can do to improve their own health as well as increase their chances of having a healthy baby. These include eating a healthy diet rich in fruits and vegetables and low in saturated and trans fats, avoiding tobacco and excessive alcohol, and, very importantly, exercising regularly. Health promotion campaigns can play an important role in providing information to women about the importance of exercise and healthy living and highlight the need for more studies that increase our understanding of what motivates this population to exercise.

1.2 Benefits of physical activity in the general population

Numerous studies have confirmed the health benefits of physical activity (Blair, 1994; Brach, Simonsick, & Kritchevsky, 2004; Centers for Disease Control and Prevention, 2001; see Pate, Pratt, Blair, Haskell, Macera et al., 1995 for review), which include increased life expectancy, decreased chances of developing type II diabetes, increased HDL (good) cholesterol, decreased blood pressure and body fat, decreased risk of several types of cancers, and improved immune function. Further, physical inactivity is a major risk factor for heart disease and stroke and is linked to cardiovascular mortality (American Heart Association, 2007).

In addition to physical health benefits, physical activity improves psychological well-being, helps individuals cope with stress, and improves mental functions such as decision making, planning and short-term memory. It also reduces anxiety and promotes healthy sleep patterns. Exercise can also be useful in preventing or alleviating depression
and, in older adults, it may help reduce the risk of dementia and Alzheimer's disease (Saxena, Van Ommeren, Tang, & Armstrong, 2005).

A sedentary life style has also been closely linked with obesity (Adams, Der Ananian, DuBose, Kirtland, & Ainsworth, 2003), which is described as having reached epidemic proportions. A 2004 Canadian community health survey, for example, concluded that obesity rates among children and adults have doubled over the last 25 years (Statistics Canada, 2002). Not surprisingly, the survey also found physical activity levels to be strong predictors of obesity. Despite these findings, the Canadian Fitness and Lifestyle Research Institute (2001) reported that in the year 2001, 57% of Canadian adults were not active enough to achieve optimal health benefits.

1.3 Benefits of physical activity during pregnancy

Just as exercise has physical and psychological benefits for non-pregnant populations, exercise during pregnancy is associated with many benefits for both mother and baby. According to the American College of Sports Medicine (ACSM), exercise during pregnancy reduces the risk of preeclampsia, treats or prevents gestational diabetes, helps manage pregnancy-related musculoskeletal issues, accelerates postpartum weight loss, positively impacts mood and mental health, and has short and long-term positive effects on offspring growth and development (ACSM, 2007). In addition, infants of physically active mothers have been found to be more exploring of their environment (Clapp, Lopez, & Harcar-Sevcik, 1999). Exercise during pregnancy is not associated with any adverse consequences to the fetus or pregnancy complications (Clapp, 1989; Duncombe et al., 2006; Hall & Kaufmann, 1987; Klebanoff, Shiono, & Carey, 1990; Kulpa, White, & Visscher, 1987).
1.4 *Physical activity patterns of pregnant women*

Studies consistently show that women tend to decrease their participation in exercise after becoming pregnant. In a review of the literature on physical activity patterns in pregnant women and their relationship to psychological health, Poudevigne and O’Connor (2006) reviewed 28 studies focusing on leisure time physical activity. All studies consistently documented decreases in physical activity both during the first trimester compared with pre-pregnancy and during pregnancy from the first to the third trimester. In particular, exercise intensity (Clissold, Hopkins, & Seddon, 1991; Zeannah & Schlosser, 1993) and duration (Dale, Mullinax, & Bryan, 1982; Jarrett & Spellacy, 1983) both decreased with pregnancy.

1.5 *Physical activity recommendations for pregnant women*

Both the Society of Obstetricians and Gynaecologists of Canada (SOGC) and the Canadian Society for Exercise Physiology (CSEP) recommend that most women participate in aerobic and strength-conditioning exercises as part of a healthy lifestyle during their pregnancy. Contraindications to exercise include ruptured membranes, preterm labour, hypertensive disorders of pregnancy, incompetent cervix, growth restricted fetus, placenta previa after week 28, persistent 2nd or 3rd trimester bleeding, and uncontrolled type I diabetes. In the absence of these or some other serious complication, it is recommended that pregnant women exercise throughout their pregnancy, with the goal being to maintain a good fitness level without trying to reach a peak fitness level or train for an athletic competition.
1.6 *Predictors of physical activity during pregnancy*

According to Poudevigne and O'Connor (2006), the strongest predictor of physical activity during pregnancy is the level of physical activity prior to pregnancy. For example, women who had been active as teenagers were 13 times more likely to engage in high-intensity physical activity during pregnancy when compared to women who had been sedentary as a teenager (Ning, Williams, & Dempsey, 2003). In addition, younger pregnant women were more likely to participate in high-intensity activities when compared to their older counterparts, and unmarried pregnant women were more active than married pregnant women (Zhang & Zavitz, 1996).

1.7 *Barriers to exercise during pregnancy*

Poudevigne and O'Connor (2006) cited physiological reasons as likely barriers to exercise during pregnancy. For example, fatigue and nausea, which are common in the first trimester, and uterine enlargement and changes in weight distribution in the third trimester are all commonly reported as barriers to physical activity. In addition, reduced activity may also be a way for pregnant women to meet the increased energy demands of pregnancy, especially during the third trimester (Agarwal, Agarwal, & Agarwal, 2001; Dufour, Reina, & Spurr, 1999). As well as these physiological factors, other barriers include time limits, caring for other children, a fear of harming either one's self or the baby and a lack of motivation (Symons Downs & Hausenblas, 2004).

1.8 *Benefits of exercise during the postpartum period*

Although more studies focusing on the outcomes of exercise during the postpartum period are needed, physical exercise is likely to be as beneficial as it is at other times in a woman's life (Larson-Meyer, 2002). According to a review of the
literature (Larson-Meyer, 2002), the possible benefits include preventing obesity, promoting strength and aerobic fitness, improving bone health and preventing bone loss associated with lactation, improving mood and self-esteem, and encouraging physical activity in the child.

1.9 Health benefits of exercise during the postpartum period

1.9.1 Aerobic fitness and muscular strength. Few studies have looked at aerobic or strength gains in the postpartum population. However, Dewey, Lovelady, Nommsen-Rivers, McCrory, and Lonnerdal (1994) and Lovelady, Garner, Moreno, and Williams (2000) found that VO$_2$ max increased by 25% and 13%, respectively, in response to a 10 to 12 week intervention. It has also been suggested (Larson-Meyer, 2002) that improving maternal fitness may lead to improved activities of mothering, such as lifting, carrying, or running after a child.

1.9.2 Bone content and bone mineral density. Although it is well-documented that lactation results in a 3% to 9% loss of axial bone mass over a period of 2 to 6 months (Cross, Hillman, Allen, & Krause, 1995; Hopkinson, Butte, Ellis, & Smith, 2000; Ritchie et al., 1998; Sowers et al., 1993), few studies have looked at whether exercise reduces bone loss in lactating women. One study that followed six athletes (Drinkwater & Chestnut, 1991) found that bone mineral density was decreased in the femoral neck, radial shaft, and lumbar vertebrae compared to prepregnancy levels. However, no control group was included and the frequency, intensity and duration of the exercise regimen were not quantified. Another study (Little & Clapp, 1998) found that bone mineral density decreased slightly less in an exercise group compared to a control group (4.1% versus 5.4%), although the difference was not statistically significant.
1.9.3 Lipoprotein profile and insulin sensitivity. In a 12-week aerobic exercise intervention for postpartum women, Lovelady, Lonnerdal, and Dewey (1990) and Lovelady, Nommsen-Rivers, McCrory, and Dewey (1995) found that exercisers showed a significant improvement in insulin response following a test meal as well as a marginal increase in high-density lipoprotein-cholesterol concentration as compared to a control group.

1.9.4 Mental stress and postpartum depression. Several studies have suggested that exercise during the postpartum period improves feelings of well-being, reduces anxiety, and lowers the incidence of postpartum depression (Clapp, 1998; Koltyn & Schultes, 1997; Sampselle, Seng, Yeo, Killion, & Oakley, 1999). In a study of 1003 women at 6 weeks postpartum, Sampselle et al. (1999) evaluated women’s psychosocial well-being and found that women who exercised vigorously had better scores in all seven of the following sub-areas: 1) quality of partner relationship; 2) perception of partner’s participation in childcare; 3) gratification from labor and delivery experience; 4) satisfaction with life circumstances; 5) confidence in ability to cope with tasks of motherhood; 6) satisfaction with motherhood and infant care; and 7) support for maternal role from family and friends.

In an intervention study aimed specifically at women between 6 and 20 weeks postpartum, Koltyn and Schultes (1997) found that a single 60-minute aerobic exercise session resulted in decreased state anxiety, depression, and total mood disturbance and increased vigor in women who exercised compared to the control group, who rested for a 60-minute period.
Although more studies are needed in order to determine the exact effects of exercise on postpartum depression, it has been suggested that the incidence of postpartum depression is lower in exercising women (Clapp, 1998). Similarly, Armstrong and Edwards (2003) found that depressed mothers of infants who participated in a 12-week exercise program had significantly improved depressive symptomatology scores and fitness levels as compared to controls not enrolled in the program. These findings are of interest given the fact that approximately 13% of women may experience postpartum depression (O’Hara & Swain, 1996).

1.9.5 Exercise and impact on breast milk. Despite concern that exercise during lactation can adversely affect breast milk production, numerous studies have found no adverse effects of exercise on milk volume or composition (Carey, Quinn, & Goodwin, 1997; Dewey et al., 1994; Lovelady, et al., 1990; Quinn & Carey, 1999). In particular, studies looking at the mineral composition of milk (Anderson, 1985; Fly, Uhlin, & Wallace, 1998) have found no change in the concentration of phosphorus, calcium, magnesium, sodium, or potassium in milk at 10, 30, or 60 minutes post-exercise. One study by Gregory, Wallace, Gfell, Marks, and King (1997) looked at the immunological properties of milk and found that a bout of maximal exercise slightly depressed concentrations of IgA, the predominant immunoglobulin found in milk, when measured 10 to 30 minutes after a treadmill test. However, concentrations returned to normal within 60 minutes of the exercise session. This study, however, has been highly criticized by other researchers (Carey & Quinn, 2001; McCrory, 2000) as failing to measure IgA properly.
A third impact of exercise on breast milk which has been studied is the possible accumulation of lactic acid in milk. Two studies (Wallace, Inbar, & Ernsthausen, 1992; Wallace & Rabin, 1992) found that breast-milk lactic acid increased after exercising to exhaustion and peaked at 10 to 30 minutes post-exercise. Other studies, however, have found that unless exercise intensity is high (Carey & Quinn, 2001; Carey et al., 1997; Quinn & Carey, 1999) there is little change in breast-milk lactic acid concentration.

1.9.6 Influence of postpartum exercise on offspring physical activity. It has been suggested that a mother’s participation in exercise may encourage physical activity habits in her children. Several studies have found correlations between childhood physical activity and parental exercise (Fogelholm, Nuutinen, Pasanen, Myohanen, & Saatela 1999; Godin, Shephard, & Colantonio, 1986; Moore et al., 1991). In a study of obese and normal-weight controls and their parents, Fogelholm et al. (1999) found that parental inactivity was a strong predictor of childhood inactivity.

1.10 Appearance benefits of exercise during the postpartum period

1.10.1 Weight loss. Most of the appearance benefits surrounding exercise during the postpartum period revolve around weight loss and regaining one’s pre-pregnancy body. Several studies (Beazley & Swinhoe, 1979; Keppel & Taffel, 1993; Ohlin & Rossner, 1990) indicate that women who have had children are at an increased risk for obesity. Although some studies have suggested that the weight gain associated with pregnancy is relatively small, ranging from 0.5-1.7 kg (Keppel & Taffel, 1993; Ohlin & Rossner, 1990; Williamson, Kahn, & Byers, 1991), these statistics ignore the fact that some women gain far more weight, and that this weight tends to be permanent and compounded with subsequent pregnancies (Parker, 1994).
The Stockholm Pregnancy and Weight Development Study found that 14% of women gained 5 kg or more when compared to their pre-pregnancy weight (Ohlin & Rossner, 1990). The National Health and Nutrition Examination Survey found that having one child increased a woman’s risk of becoming moderately overweight by 60% and becoming obese by 110% (Keppel & Taffel, 1993). In addition, it appears that certain lifestyle, metabolic or genetic factors may predispose certain groups of women, especially African-American women, to gain almost twice as much weight following pregnancy as white women (Smith et al., 1994).

Several studies (Harris, Ellison, & Clement, 1999; Ohlin & Rossner, 1996; Sampselle et al., 1999) have found that women who are physically active are likely to return to their pre-pregnancy body weight more quickly than their more sedentary counterparts. The Stockholm Pregnancy and Weight Development Study looked at 1432 women at one year postpartum and found that return to pre-pregnancy weight was more successful in women with regular physical activity habits, high lactation scores (reflecting duration and frequency of breast-feeding), and regular breakfast and lunch habits (Ohlin & Rossner, 1996). In a study of 1003 women at 6 weeks postpartum, Sampselle et al. (1999) assessed participation in vigorous exercise, change in postpartum activity level, postpartum weight retention, infant feeding method, maternal postpartum adaptation, and participation in activities for fun. Results showed that 35% of women reported participating in vigorous exercise at least 3 times per week and more active women had retained less weight (8.6 lb) compared with their less active counterparts (11.3 lb). Exercisers also scored better on measures of postpartum adaptation and were more likely to participate in activities such as socializing, hobbies or entertainment.
1.10.2 Skin and hair health. Exercise can also contribute to a healthier and rosier-looking complexion by improving blood flow to the skin. Increasing circulation also enhances the production of elastin and collagen, two essential proteins that give skin its elasticity and firmness (Sears, 2007). Among the benefits of exercise on skin health is an increased circulation leading to an improved delivery of nutrients to skin cells, and the removal of toxins (Kunin & Gottlieb, 2005). However, most dramatic may be the effects of exercise on acne-prone skin. By mediating the production of testosterone-related hormones and reducing stress levels, exercise can help control acne flare-ups, reduce androgenic hair loss and improve the appearance of hair (Goldberg, 2007; Kunin & Gottlieb, 2005). This is especially beneficial during pregnancy, when hormonal, metabolic, and immunologic changes often lead to acne breakouts and other skin problems such as eczema and skin tags (Kumari, Jaisankar, & Thappa, 2007).

Exercise can also help get rid of cellulite by improving collagen production and pulling the fibrous connections of the skin tighter together. In addition, toning and conditioning muscles also has a firming effect on the skin that attaches to those muscles, reducing the appearance of cellulite (Kunin & Gottlieb, 2005), and improving overall appearance.

1.10.3 Body image satisfaction. Exercise can also help improve women’s attitudes towards their bodies (Clapp, 1998), which is important given that body dissatisfaction tends to peak during the postpartum period (Strang & Sullivan, 1985). Further, 70% of women are dissatisfied with their bodily appearance at 6 months postpartum, with 39% still dissatisfied at 1 year (Fischman, Rankin, Soeken, & Lenz, 1986). In a study that looked primarily at the link between exercise and postpartum
depression, Clapp (1998) also reported that exercising women had more positive attitudes about their bodies during and after pregnancy than did non-exercising women.

Although few if any studies have looked specifically at the effects of exercise on body image in postpartum women, exercise is associated with improved body image in the general population (Hausenblas & Fallon, 2006). A meta-analysis of the literature on exercise and body image in the general population indicated that exercisers had a more positive body image than non-exercisers. Participants reported more positive body image post-intervention scores when compared to non-exercising controls, and exercisers reported improved body image scores following exercise interventions (Hausenblas & Fallon, 2006).

1.11 Physical activity patterns of postpartum women

Most studies consistently find that women are more sedentary after having children than prior to pregnancy, with rates pointing to approximately 60% of mothers as inactive (Symons Downs & Hausenblas, 2004). In an intervention study aimed at increasing the activity levels of young mothers, Miller, Trost, and Brown (2002) found that less than half of the 554 women were sufficiently active at the beginning of the study. Bauman et al. (2003) found that mothers of young children constitute a sub-group with one of the lowest levels of physical activity, while Brown and Bauman (2000) found that two-thirds of mothers were not ‘adequately active’ for health benefits.

1.12 Exercise recommendations during the postpartum period

There are few guidelines for postpartum exercise (Larson-Meyer, 2002). The American College of Obstetricians and Gynecologists (2007) recommends that pre-pregnancy exercise routines should be gradually resumed beginning at around 4 to 6
weeks postpartum when some of the lingering physiological changes of pregnancy (e.g., postural changes associated with enlarged uterus; loosening of ligaments; digestive, cardiovascular, and renal changes) are no longer a factor. Clapp (1998) suggested that the main goal of exercise in the initial 6 weeks is to obtain personal time and redevelop a sense of control. He recommends beginning slowly and avoiding excessive fatigue and dehydration, and stopping if there is pain or vaginal bleeding.

1.13 **Barriers to exercise during the postpartum period**

Several studies have examined barriers to physical activity during the postpartum period. Symons Downs and Hausenblas (2004) found that the top obstructing factors that women cited were: time limits, physical limitations and restrictions, tiredness and fatigue, fear of harming oneself, and lack of motivation or feeling lazy.

Albright, Maddock, and Nigg (2006) investigated physical activity and related psychosocial factors in 79 new Hawaiian mothers of varying ethnic backgrounds. The authors surveyed their physical activity patterns before and after childbirth. They found a dramatic decrease in physical activity in the postpartum period, with 43% of women having been active before birth but inactive after. Barriers that the women cited were lack of support from a spouse, and parenting duties, whereas facilitators included social support for exercise and the availability of childcare.

Gennaro and Fehder (2000) sought to identify exercise barriers and personal experiences by interviewing 10 first-time mothers who were 3-15 months postpartum and had been active prior to pregnancy. Consistently, the mothers perceived more barriers to exercise after pregnancy than compared to before becoming pregnant. The five main barrier groups which emerged were personal (e.g., tiredness, low energy, low motivation,
soreness and complications, low exercise tolerance, high expectations, and appearance concerns), interpersonal (e.g., ethic of care/sense of entitlement, domestic chores, unpredictable routines, organizational demands, the health and mood of their baby, and lack of partner support), sociocultural (e.g., lack of support from family, friends, and other mothers), physical environment (e.g., access to preferred exercise environment, available finances, and weather) and healthcare environment (e.g., lack of information, advice, or encouragement).

1.14 Women's interest in postpartum exercise interventions

Despite the fact that physical activity levels are low in postpartum women, this group does indicate a desire to have exercise programs designed for them. Ostbye et al. (2003) examined the diet and physical activity interests of postpartum partners of active military personnel. One hundred and sixty-one women who were 6-8 weeks postpartum completed surveys to assess their diet and exercise interests and preferences. Despite the young age of the women (mean age 27 years), more than one-third reported being either overweight or obese before pregnancy. The study revealed that the women shared a high interest in seeing more interventions that promoted physical activity and facilitated social interaction (Ostbye et al., 2003).

A focus group discussion for pregnant and postpartum Latino women revealed similar needs (Kieffer, Willis, Arellano, & Guzman, 2002). In a study designed to identify women's perspectives towards exercise, the women expressed a need for organized group interventions in respectable locations that offered safe physical activities for mothers and children.
1.15 **Non-theory based exercise interventions for postpartum women**

Watson, Milat and Thomas (2005) examined the effectiveness of a weekly stroller walking group on postpartum women’s self-reported physical activity, mental health, and satisfaction with social contacts. All women (control and intervention) completed a baseline questionnaire and a follow-up questionnaire 6 months later. The study found no significant increase in the physical activity levels of mothers who participated in the intervention from baseline to follow-up. However, women in the intervention group reported being more satisfied with the quality of their social contacts, indicating that the women had formed friendships within the stroller walking group.

In a study designed to test the effectiveness of a structured versus an unstructured diet and physical activity program for postpartum women, O’Toole, Sawicki, and Artal (2003) found that women who participated in the structured program were more successful at losing pregnancy-related weight. The women in the intervention met weekly to share their daily diet and physical activities diaries whereas subjects in the self-directed group received a single 1-hour information session on diet and activity. Results showed that at 12 months postpartum, women in the structured intervention had lost significantly more weight.

1.16 **Theory-based exercise interventions for postpartum women**

Although there have not been many theory-driven exercise interventions for postpartum women, several recent studies have all found that theory-based approaches were effective in increasing physical activity participation. For example, Cramp and Brawley (2006) compared the effects of a group-mediated cognitive behavioral (GMCB) intervention based on social-cognitive theory and group dynamics to a standard care
postnatal exercise program. The study randomized 57 postnatal women to one of two conditions. Both groups received a 4-week exercise training course. In addition, subjects in the experimental group received self-regulatory behavioral skills training through six group counseling sessions. Among the skills that were covered, subjects learned how to self-monitor their daily activities, set goals, and overcome physical activity barriers. For example, participants were taught how to set effective goals and clearly define their personal barriers by brainstorming a list of barriers and strategies to overcome these barriers. The authors found the GMCB intervention was successful and produced greater improvements in overall physical activity behavior, barrier efficacy and proximal outcome expectations when compared to the control group.

In another study, Miller et al. (2002) focused on building self-efficacy and partner support. The authors recruited women with young children and assigned them to one of three conditions: 1) control; 2) receiving print information about overcoming physical activity barriers; and 3) receiving print information plus an invitation to attend discussion groups about the development of strategies for physical activity promotion specifically for mothers. The authors found that not only were women in the third group significantly more active, but that the effects of the intervention could also be partially attributed to changes in partner support and physical activity self-efficacy.

A third study by Fahrenwald, Atwood, Walker, Johnson, and Berg (2004) was based on selected constructs from the Transtheoretical Model (TTM) and aimed to evaluate progression through stage of behavior change, increase physical activity behavior and facilitate improvements in the behavior change constructs of self-efficacy and decisional balance. The results showed that women who received training based on
components of the TTM were more successful in increasing their physical activity compared to the control group.

The Just For You program was designed to promote physical activity and healthy eating in low income and racially diverse postpartum women (Ebbeling et al., 2007). It used a social ecological framework and integrated constructs from Social Cognitive Theory, Behavioral Choice Theory, and the TTM. The development of the program involved selecting public health guidelines and translating them into intervention messages, operationalizing theoretical constructs, identifying objectives and conducting formative feedback. Six hundred and seventy-nine mothers eligible for the WIC program (Program for Women, Infants, and Children) were enrolled in a 12-month program in collaboration with community centers in several different metropolitan areas. Paraprofessionals from the Expanded Food and Nutrition Education Program acted as 'health mentors', providing home visits and meeting with the women to provide guidance and help track their progress. Pre-testing revealed that at 12 months postpartum, participants had an increased intake of fruits and vegetables, decreased consumption of saturated fat, and increased total moderate-to-vigorous physical activity.

1.17 Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1985, 1991) is a theoretical model which has been used successfully in order to predict and understand exercise and other health behaviors such as weight loss, alcohol abuse, and smoking behavior (Godin, Valoi, Lepage, & Desharnais, 1992; Marcoux & Shope, 1997; Nejad, Wertheim, & Greenwood, 2004). The TPB explains volitional behaviors and assumes that human beings are rational, make systematic use of information, and consider the implications of their
actions before deciding whether to engage or not engage in certain behaviors. Originating in the field of social psychology, the TPB developed out of the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975).

According to the TRA, behavioral intention is the strongest predictor of behavior. Intention represents how much effort people are planning to exert and how hard they are willing to try to perform a behavior. Intention is determined by one’s attitude towards performing a behavior and the perceived social pressures to perform the behavior, called subjective norms (SN).

A person’s attitude towards a behavior is the degree to which undertaking the behavior is either positively or negatively valued (Ajzen, 2007). It is comprised of a person’s behavioral beliefs: what they expect to achieve by performing the behavior (expected outcome), and outcome value, meaning how much they value the outcome of the behavior. Together, these two behavioral beliefs determine the individual’s positive or negative evaluation of those consequences. Hausenblas, Carron, and Mack (1997) pointed out that when it comes to exercise, an individual’s beliefs could be represented by positive expectations (e.g., improved personal health) and negative expectations (e.g., feeling considerable discomfort from physical exertion). For example, an individual may expect to lose weight as a result of increasing his/her physical activity level (expected outcome). A positive attitude will result if she also highly values losing weight (outcome value).

Subjective norm is the social pressure to engage or not engage in a particular behavior that an individual perceives from others (Ajzen, 2007). It is the product of an individual’s normative beliefs – his/her perceptions about the expectations that important
others have of him/her, and the motivation to comply with these others’ expectations. As with attitudes, subjective norms are composed of two beliefs: perceptions of others’ expectations and the motivation to comply with these expectations. For example, a new mother would be more likely to exercise if she perceived that her partner felt she should do so and if she highly valued his opinions and was motivated to comply. By contrast, a woman would be less likely to exercise if she felt as though her partner did not feel she should exercise, or she was unmotivated to comply with his beliefs.

In a meta-analytic review of the TRA and exercise behavior, Hagger, Chatzisarantis, and Biddle (2002) analyzed 72 studies using path analysis to examine the pattern of relationships among the various variables. They found that intentions significantly predicted behavior ($\beta=.51$). In addition, attitudes were the strongest predictors of intention ($\beta = .56$), and subjective norms contributed a small but still significant influence on intentions ($\beta = .12$). In conclusion, the authors stated that the TRA model explained 37.27% of the variance in intentions and 26.04% of the total variance in actual behavior.

However, because the TRA fails to explain behavior in cases where people feel they have little power over their behavior (e.g., addictive behaviors such as smoking or alcoholism), Ajzen (1985, 1988, 1991) added a third element to the original model, perceived behavioral control (PBC), and the new model became known as the TPB (see Figure 1).

Perceived behavioral control refers to the perceived ease or difficulty of performing a particular behavior and is determined by the control beliefs that an individual holds surrounding the behavior. The first belief relates to the facilitating and
obstructing factors. The second belief is the strength component, which is determined by the perceived power of the facilitating and obstructing factors (Ajzen, 2007). Unlike attitudes and subjective norms which influence behavior only indirectly through their influence on intention, perceived behavioral control can affect behavior both directly through its impact on behavior, and indirectly through its impact on behavioral intentions, which in turn can affect behavior.

Figure 1: TPB Model

(Ajzen, 1991)

Among numerous health behaviors, physical activity can be perceived as potentially being subject to fairly high external barriers. For example, there are many factors which may prevent an individual from exercising. These include physiological deterrents such as pain, swelling of joints, or trouble breathing during more intense exercise; social barriers such as lack of support, childcare responsibilities, lack of time, or living in an area where it is not safe to spend a great deal of time outdoors; environmental deterrents such as bad weather; financial issues such as lack of funds to join a health club
or buy home equipment; and personal issues such as low self esteem, lack of skills, or lack of education.

1.18 TPB and exercise

According to Maddux (1993), it is the TPB that has guided most of the research on health and exercise behavior. In two reviews summarizing the results of studies using the TRA and TPB as applied to exercise behavior, Blue (1995) and Godin (1993) found that the most important variable for predicting intention was attitude. By contrast, social pressure did not strongly influence intention to exercise. On average, perceived behavioral control explained an additional 8% of the variance in exercise behavior over and above TRA variables. Blue concluded that not only is the TPB superior to the TRA due to its increased predictive qualities, but it also “does not make the assumption that control for exercise behavior rests solely in the individual” (Blue, 1995, p. 115).

In a meta-analysis designed to statistically examine the utility of the TPB and the TRA in explaining and predicting exercise behavior, Hausenblas et al. (1997) found that intention had a large effect (ES = 1.09) on exercise behavior. Therefore, once individuals have formed the intention, exercise behavior is likely the next step. Attitude was also found to have a large effect on intention to exercise (ES=1.22), whereas subjective norms had only a moderate effect on intention to exercise (ES=0.56). Perceived behavioral control was found to have a large effect on both intention to exercise (ES=0.97) and exercise behavior itself (ES=1.01).

A more recent meta-analysis by Hagger et al. (2002) compared the effectiveness of the TRA and the TPB in an exercise setting and found the TPB to account for more variance in intention as compared to the TRA (44.50% versus 37.27%). In addition to
being applied to the general public, the TPB has been used successfully with pregnant populations (Godin, 1993; Hausenblas & Symons Downs, 2005; Symons Downs & Hausenblas, 2004) and, specifically, in determining pregnant women's intentions to exercise postpartum (Godin, Vezina, & Leclerc, 1989).

1.19  **TPB and exercise during pregnancy**

Symons Downs and Hausenblas (2003) examined the TPB's utility for understanding and explaining pregnant women's intentions to exercise and their exercise behavior during their second trimester. Participants were recruited from an obstetrician's office and consisted of 89 pregnant women (mean age = 29.96 years, *SD* = 4.45). TPB variables (attitude, subjective norms, perceived behavioral control) and demographic information was collected. Women were mailed questionnaires assessing the same variables during the first 2 weeks of their second trimester (Time 1). During the first 2 weeks of their third trimester (Time 2), a questionnaire assessing their exercise behavior during the 2nd trimester was mailed to participants.

Pearson correlations showed intention (*r* = .67) and perceived behavioral control (*r* = .49) to be the most strongly correlated with exercise behavior, and attitude (*r* = .54) and perceived behavioral control (*r* = .54) to be most strongly correlated with intention, followed by subjective norms (*r* = .43). A hierarchical regression analysis was used to examine the utility of the TPB for predicting second trimester exercise behavior.

Intention and perceived behavioral control explained 47% of the variance in exercise behavior, with only intention a significant predictor of behavior. The second regression analysis assessed the ability of attitude, subjective norms, and perceived behavioral control to predict intention. In the final model, 37% of the variance in intention was
accounted for, with attitude and perceived behavioral control both significant contributors.

The findings provide support for the TPB as a framework for understanding the determinants of pregnant women’s exercise intention and behavior. Intention significantly predicted exercise behavior, and attitude and perceived behavioral control predicted pregnant women’s exercise intention. Although attitude was the strongest determinant of intention, it was only slightly stronger in predicting intention than perceived behavioral control. The authors noted that subjective norms were less important in determining exercise intention than attitudes or perceived behavioral control and that there may be limitations due to its operationalization and measurement. In particular, it is not well understood whether people’s exercise intention is affected by their motivation as a result of the belief that important others want them to exercise, or whether it is the presence of social support and praise that result when significant others want them to exercise that influences their intention.

In another study applying the TPB to exercise during pregnancy, Hausenblas and Symons Downs (2004) prospectively examined pregnant women's exercise intention and behavior during their first trimester. One hundred and four pregnant women completed measures of exercise attitude, subjective norms, perceived behavioral control, intention, and behavior. Hierarchical regression analyses found perceived behavioral control to be a significant predictor of exercise behavior, while attitude and subjective norms were significant predictors of exercise intention.
1.20 TPB and postpartum exercise behavior

In a study aimed at examining the determinants of exercise motivation among ethnically diverse postpartum women, Symons Downs (2006) examined the predictive utility of the TRA and TPB for explaining exercise intention, taking into account the moderating influence of ethnicity. Sixty-three low-income, postpartum women completed self-report measures assessing their intention to exercise as well as their attitudes towards exercise, subjective norms for exercise, and perceived behavioral control. Attitude and subjective norms were found to explain 66% of the variance in intention, while perceived behavioral control was not a significant predictor. The author noted that given that the women were all of low-income level, they may have believed that exercise was not within their control (i.e., due to insufficient money or time).

1.21 TPB and intention of pregnant women to exercise postpartum

Godin et al. (1989) sampled 98 pregnant women to identify factors that may influence their decision to exercise after giving birth. The women were asked to complete a questionnaire assessing attitudes, social norms, perceived barriers to exercise, and intention regarding exercise after giving birth. A demographics questionnaire also assessed age, education level, exercise habits, number of months elapsed since the onset of present pregnancy and number of children.

A regression analysis of intention to exercise on all variables for the nullipara (women pregnant with their first child) accounted for 52% of the variance. Attitudes, habit, and perceived barriers contributed almost equally to the prediction of intentions. For pluripara (women pregnant with their second or subsequent child), a regression analysis of all the variables explained 60 percent of the variation in intention to exercise.
In order of decreasing importance, the three variables accounting significantly for this variance were perceived barriers, attitudes and subjective social norms. For the total sample, the regression analysis accounted for 55% of the variance in intention, with barriers the strongest predictor, followed by attitudes, habit, and number of previous pregnancies. In conclusion, this study showed that the experience of a previous postnatal period modifies the composition of intentions to exercise, with pregnant pluripara being more realistic and attributing more importance to the barriers of exercise.

1.22 TPB and the moderating role of personality

It has been suggested that personality traits may play a moderating role in the TPB for exercise and that their inclusion may help increase the unexplained variance in intention and behavior (Rhodes, Courneya, & Jones, 2005). Rhodes et al. (2005) examined lower-order personality facet traits of neuroticism, extraversion, and conscientiousness as moderating factors in the TPB. Two hundred and ninety-eight undergraduate students completed TPB measures, personality measures, and a 2-week follow-up of exercise behavior. Two facet traits (industriousness-ambition and irritability) significantly moderated the relationship between exercise behavior and the TPB variables, while two others (insecurity and activity-adventurousness) moderated the relationship between intention and the TPB variables. The addition of these personality variables helped account for an additional 3-4% of the unexplained variance in exercise behavior.

In another study focusing on the exercise domain in particular, Rhodes and Courneya (2002) examined the moderating influence of the Five-Factor Model of personality on the TPB. Three hundred undergraduate students completed questionnaires
assessing the Five Factor Model, TPB constructs, and a follow-up of exercise behavior 2 weeks later. The authors used a median split for each personality trait in order to facilitate a two-group structural equation model of the TPB. Results showed that the personality traits of neuroticism and extraversion both moderated the effect of subjective norms on intention, while conscientiousness moderated affective attitude on intention as well as intention on behavior. Yet another personality trait which has been found to have a moderating influence on the TPB is self-monitoring (Hillhouse, Turrisi, & Kastner, 2000; Prislin & Kovrlija, 1992).

1.23 Self-monitoring

Self-monitoring refers to the process through which people regulate their own behavior in order to "look good" so that they will be perceived by others in a favorable manner. Snyder (1979) separated self-monitors into two distinct groups: high and low. High self-monitors are those individuals who are highly concerned with the social appropriateness of their actions and regulate their behavior using external cues from others in order to modify their behavior. Low self-monitors are more controlled from within by their own attitudes and affective states, using internal cues to modify their behavior. In addition, high self-monitors monitor their behavior to fit different situations while low self-monitors tend to be more cross-situationally consistent.

1.24 Self-monitoring and health behaviors

Self-monitoring has been found to influence participation in both health enhancing and health risk behaviors. In a study designed to identify personality, attitudinal and behavioral correlates of binge drinking and smoking among adolescent girls and young women, Pirkle and Richter (2004) found that high self-monitoring girls
and young women were more likely to binge drink. The authors explained this finding by explaining that binge drinking – especially for girls and young women – is typically a social activity that is highly susceptible to peer pressure. Thus, the desire to appear ‘cool’ or ‘be part of the group’ is consistent with self-monitoring. Perrine and Aloise-Young (2004) found self-monitoring to be a moderating influence on the relationship between peer pressure and smoking onset in fifth and seventh graders. In particular, high self-monitors who saw smoking as a normative behavior were three and a half times more likely to become smokers over a 1-year period as compared to high self-monitors who did not see smoking as a normative behavior.

1.25 Self-monitoring, the TPB and exercise

In a study done to test the predictive ability of the TPB with the additional variables of past behavior and self-monitoring, Bozionelos and Bennett (1999) had 114 subjects complete questionnaires assessing past behavior, attitudes, subjective norms, perceived behavioral control and self-monitoring. Three weeks later, they reported their exercise behavior. Results showed that self-monitoring moderated the effect of attitudes on intention to exercise. Individuals reporting a high intention to exercise and who were low in self-monitoring reported more positive attitudes towards exercise than individuals with low intentions to exercise. As expected, the relationship between exercise attitudes and intentions was weaker in individuals high in self-monitoring. This is consistent with other findings (Hillhouse et al., 2000; Prislin & Kovrlija, 1992), with the relationship between attitudes and intention stronger for low self-monitors as compared to high self-monitors. However, self-monitoring is not only related to the relative contribution that
attitudes or subjective norms may make to intentions, but it may also moderate the receptiveness of an individual to different types of messages.

1.26 Health versus appearance messages in the health domain

Many different types of persuasive messages have been used in an attempt to reduce maladaptive health behaviors (such as engaging in unsafe sex, smoking, failing to use sunscreen and excessively tanning) and to increase adaptive health behaviors (such as engaging in regular exercise, eating a diet low in fat and cholesterol). Two such types of messages are health and appearance-based messages. Both promise the individual certain rewards in exchange for adopting a recommended health behavior – one promises an individual better health and the avoidance of certain diseases, whereas the other promises that one will look better and be more attractive. The effectiveness of these two types of approaches on intentions and behaviors has been investigated across numerous health behaviors.

1.26.1 Healthy eating. According to Hayes and Ross (1987), two types of motivation underlie healthy eating habits: concern with appearance and concern with health. Based on a telephone survey of 400 adults, the authors found that for the average person, appearance concerns had a stronger effect on eating habits than did health concerns. The authors also examined the relationship between various demographic factors and concern with appearance and found that women, as expected, were both more concerned with appearance and had better eating habits as compared to men. In addition, the authors looked at people’s involvement in exercise and found that concern with appearance increased the likelihood that they would participate in an individual exercise such as jogging, swimming, or bicycling but had no effect on group exercise.
1.26.2 *Sun protection behaviors*. In the case of tanning or sunbathing, high appearance concern often leads to health risk behaviors such as excessive tanning and the failure to use sunscreen (Leary, Saltzman, & Gergeson, 1997). For example, Leary and Jones (1994) examined cognitive, motivational, and attitudinal predictors of two different factors that have been associated with an increased risk of skin cancer: inadequate use of sunscreen and increasing one’s exposure to UV radiation. The strongest predictor of subjects’ exposure to both natural and artificial UV radiation was concern for one’s appearance along with the belief that a tan enhances attractiveness.

Further, appearance-based messages that describe how sun exposure is detrimental to one’s appearance in the long run have been found to be successful in persuading individuals to protect themselves from the sun by wearing protective clothing or sunblock (Jones & Leary, 1994; Prentice-Dunn, Jones, & Floyd, 1997). For example, Mahler, Kulik, Gibbons, Gerrard, and Harrell (2003) found that giving students and beachgoers a UV photo which made the negative appearance consequences of UV exposure more salient was more effective in increasing intentions to use sunscreen than the same intervention without the photo. In addition, a follow-up study showed that the intervention also led to greater sun protective behaviors.

1.26.3 *Osteoporosis*. Klohn and Rogers (1991) found that stressing the highly visible and disfiguring features of osteoporosis strengthened young women’s motivation to take steps to prevent it. The researchers presented 170 women between the ages of 16 and 25 at risk for osteoporosis with several different written persuasive messages on the effects of osteoporosis. The study found that the message that described osteoporosis as disfiguring and highly visible had the strongest effect in increasing beliefs about the
severity of osteoporosis and strengthening the women’s intentions to take preventative measures.

1.26.4 *Exercise attitudes.* Berry and Howe (2004) set out to test the effects of televised health-based and appearance-based exercise advertising on exercise attitudes, social physique anxiety, and self-presentation. The authors pointed out that despite the range of possible motivators for exercise, the public sector has focused almost exclusively on health whereas the private sector has focused on attractive appearance as a motivator. They hypothesized that participants in the health condition would have a more positive attitude toward exercise, and that exercisers would have better exercise attitudes. The participants were 127 students (mean age 19.9 years) who were either classified as exercisers (meaning they exercised for at least 30 minutes, three times a week) or non-exercisers. They completed measures of social physique anxiety, self-presentation, and physical activity. Subjects were randomly assigned to one of three groups: 1) health: 20 minute video about Japanese culture with three health-based commercials about exercise; 2) appearance: same 20 minute video about Japanese culture with three appearance-based commercials about exercise; and 3) control: same 20 minute video about Japanese culture with three commercials unrelated to exercise. The authors found that health-based advertising had significant positive effects on self-presentation for exercisers, while appearance-based advertising had negative effects on non-exercisers' attitudes towards exercise.

1.27 *Personality factors and persuasive messages*

Whereas health communication has traditionally focused on debates over the effectiveness of different types of appeals, particularly rational versus emotional health
appeals, Dutta-Bergman (2003) points out that the failure of many health campaigns has led to an increased need for a bottom-up approach that involves a better understanding of the audience before developing a campaign. She argues that the effectiveness of a particular message type depends upon the needs of the particular audience in question and that attention to personality variables is critical. In addition, developments in interactive technology have made it easier for communicators to target an audience with more specific personality characteristics (Dutta-Bergman, 2003; Rimer & Glassman, 1998).

1.28 Self-monitoring and persuasive messages

Studies in the field of marketing psychology have found a link between self-monitoring and responses to advertising messages. For example, in a series of three studies, DeBono and Snyder (1989) found that high self-monitors tended to be more responsive to image-oriented ads and low self-monitors were more responsive to quality-based ads. Not only did high self-monitors rate the three image-based ads (which each advertised a different alcoholic beverage) as more appealing and more persuasive, but they also stated that they would pay more for a product advertised through an image-based ad. By contrast, low self-monitors were more likely to pay more when the ad focused on the product. In a similar study by Covell, Dion, and Dion (1994), males, females and their parents were presented with either an image-oriented or quality-oriented tobacco and alcohol advertisement. All subjects liked image-oriented advertisements more than quality-oriented advertisements. In addition, girls’ parents who were high in self-monitoring found image-oriented advertisements to be more persuasive.
1.29  *Self-monitoring and persuasive health messages*

Dutta-Bergman (2003) examined whether the personality construct of self-monitoring could help determine whether social appeals or utilitarian functional appeals would be more effective for a particular individual. Ninety-three undergraduate students were recruited to participate in the study, in which they viewed different messages about AIDS. As hypothesized, high self-monitors showed more positive responses to social appeals while low self-monitors showed stronger responses to functional appeals.

1.30  *Self-monitoring, the TPB, exercise and persuasive messages*

Rhodes and Courneya (2000) examined the effects of a health-based versus appearance-based persuasive message on exercise attitudes and intentions with the goal of determining whether these effects were moderated by the personality trait of self-monitoring. The authors presented 209 university students with one of two persuasive messages. One focused on the health benefits of exercise and the other on the appearance-based benefits. Students completed demographic, exercise behavior and self-monitoring measures before reading one of two messages (health or appearance benefits). Following the message, measures of attitude and intention to exercise were completed. Although the authors noted that subjective norms and perceived behavioral control are also key concepts of the TPB, these concepts were not measured because it was hypothesized that the persuasive communications would change the behavioral beliefs underlying attitude, but not the normative beliefs underlying subjective norms or the control beliefs underlying perceived behavioral control.

The results showed no significant differences for the main effects of self-monitoring or message content but the hypothesized interaction was significant for
attitudes. Follow-up tests showed low self-monitoring individuals who received the health-based message had significantly higher scores on attitude than both the low self-monitoring individuals who received the appearance-based message and the high self-monitoring individuals who received the health-based message.

1.31 Conclusion

Pregnancy and the postpartum are important time periods in the lives of women. In particular, the physical demands of pregnancy and caring after a newborn highlight the need for health and well-being. Exercise is invaluable at this time, giving women a much-needed break, relieving stress, and helping prevent disease. Given the important role that persuasive messages (in the form of brochures, television commercials, billboards, posters) can play in educating the public, insight into how a woman’s individual personality (such as self-monitoring level) moderates what makes some messages more effective than others is important. Further, because of the TPB’s immense past contribution to our understanding of exercise and other health behaviors, it is likely a helpful framework for understanding the role that self-monitoring plays in moderating the effectiveness of health-based versus appearance-based messages on pregnant women’s intentions to exercise postpartum.
CHAPTER TWO: RATIONALE, RESEARCH QUESTIONS, & HYPOTHESES

As noted in the previous chapter, women who engage in regular exercise during the postpartum period enjoy many health as well as appearance benefits. Health benefits include preventing obesity, promoting strength and aerobic fitness, improving bone health and preventing bone loss associated with lactation, as well as improving mood and self-esteem (see Larson-Meyer, 2002 for review). Appearance benefits include losing pregnancy-associated weight and regaining one’s pre-pregnancy body, improving skin and hair quality, and improving body image satisfaction (Beazley & Swinhoe, 1979; Clapp, 1998; Kunin & Gottlieb, 2005). However, studies have consistently found that approximately two-thirds of postpartum women are not sufficiently active (Bauman et al., 2003; Brown & Bauman, 2000; Miller, 2002). It is therefore important to examine factors that may help encourage this population to be more physically active. This study examined the role that persuasive messages – both health-based and appearance-based – may play in encouraging pregnant women to increase their intentions for physical activity postpartum.

2.1 Rationale

Despite the confirmed benefits of exercise, mothers of young children and postpartum women constitute a group with one of the lowest physical activity levels (Brown & Bauman, 2000; Miller, 2002). Health promotion campaigns and persuasive messages may be one way in which this population may be encouraged to engage in more exercise. Brochures are a popular way to deliver information to the population and compared to televised messages, billboard ads or magazine articles, they are inexpensive, can be taken home and re-read, can be made readily available in as many locations as
needed, and focus on one subject only. They may be especially useful for pregnant women as they could be given out or made available in doctors’ offices, obstetricians’ offices, ultrasound clinics, or even maternity wear and baby stores.

Theoretically driven interventions have been shown to be an effective way of increasing exercise behavior in postpartum women (Cramp & Brawley, 2006; Fahrenwald et al., 2004; Miller et al., 2002), and the TPB as chosen for this study for several reasons. First, it has guided the majority of research on exercise behavior (Maddux, 1993) and has been found to be an effective model for understanding and predicting exercise behavior in pregnant and postpartum women (Hausenblas & Symons Downs, 2004; Symons Downs, 2006; Symons Downs & Hausenblas, 2003). Secondly, through their design, persuasive messages can target all TPB variables. Attitudes can be improved through the portrayal of attractive outcomes, subjective norm can be increased by portraying exercise as a socially valued behavior, and perceived behavioral control can be increased by suggesting ways in which barriers can be overcome, all ultimately leading to increased intention to exercise postpartum. Thirdly, this study sought to explore whether Rhodes and Courneya’s (2000) findings with respect to health and appearance based message and intention to be active could be replicated using a sample of postpartum women rather than college students.

Furthermore, individual audience characteristics may make persuasive messages particularly effective (Dutta-Bergman, 2003). These characteristics can include personality traits, cultural affiliations, or demographic variables. Among personality traits, self-monitoring has been found to influence the effectiveness of health-based versus appearance-based exercise messages in college populations (Rhodes & Courneya,
and may be particularly important during pregnancy when women tend to worry about their appearance and about regaining their pre-pregnancy body (Shiow-Ru, Chao, & Kenney, 2006). In addition, pregnancy and the postpartum period may be times when women are especially concerned about how others perceive them as they adapt to their new social role as ‘mothers’. The desire to be a ‘good mother’ and to be perceived as such may be influenced by a woman’s self-monitoring status.

However, there are no known studies that have examined the effects of health versus appearance types of persuasive messages on pregnant women’s intentions to exercise postpartum or which have looked at self-monitoring in pregnant women and how it relates to their intention to exercise postpartum. Therefore, the present study examined the effectiveness of two types of persuasive messages (health versus appearance) on pregnant women’s attitudes, subjective norms, perceived behavioral control and intention to exercise after the birth of their baby. Furthermore, it examined whether self-monitoring plays a role in moderating the effectiveness of these two types of messages on pregnant women’s intention to exercise postpartum.

The significance of regular exercise during the postpartum period (for review, see Larson-Meyer, 2002) coupled with the fact that approximately 60 percent of women are inactive after the birth of their baby (Miller et al., 2002; Symons Downs & Hausenblas, 2004) highlights the need for more research in this area. Furthermore, brochures are a popular and inexpensive way to disseminate information to a variety of populations, including pregnant women. For these reasons, the present study has practical and real world implications by contributing to our understanding of what types of messages, in a
2.2 Research questions

The primary purpose of the investigation was to examine the effectiveness of health-based versus appearance-based messages on pregnant women’s intentions to exercise postpartum, and whether the personality trait of self-monitoring influences the effectiveness of these messages. The specific research questions to be investigated were:

1. Is a health or appearance based message in a brochure format more effective for influencing pregnant women’s intentions to exercise postpartum, attitudes to exercise, subjective norms for exercise, and perceived behavioral control for exercise, and is the effectiveness of these types of messages moderated by the personality trait of self-monitoring?

2. Is pre-pregnancy exercise behavior or current exercise behavior related to attitudes, subjective norms, perceived behavioral control or intention to exercise?

3. Do pre-pregnancy physical activity, attitudes, subjective norms, and perceived behavioral control predict intention to exercise postpartum, and what is their relative importance in contributing to that prediction based on self-monitoring status?

2.3 Hypotheses

The following hypotheses were put forth in response to the research questions stated above:
1. Women who are high in self-monitoring were expected to report more positive attitudes, higher subjective norms, higher perceived behavioral control and a higher intention to exercise postpartum in response to an appearance-based message, whereas women low in self-monitoring were expected to report more positive attitudes, higher subjective norms, higher perceived behavioral control and a higher intention to exercise postpartum in response to a health-based message.

Rationale: Self-monitoring is a personality trait that, in part, determines how concerned we are about the impressions we make on others and how willing we are to change our behavior in order to create these impressions (Snyder, 1974). For example, individuals high in self-monitoring may worry more about what others think of them and adjust their behavior accordingly in order to impress other people. Given the pervasiveness of the ‘thinness ideal’ in our society, many pregnant women worry about regaining their pre-pregnancy body and weight after birth (Shiow-Ru et al., 2006). In particular, women high in self-monitoring may be particularly concerned since physical appearance – and thus indirectly weight – are often perceived to play an important role in impression management and construction (Rhodes & Courneya, 2000; Tseelon, 1992).

2. A woman’s exercise level before pregnancy and during pregnancy were expected to be positively correlated with attitudes, subjective norms, perceived behavioral control and intention to exercise postpartum.
Rationale: Past behavior has been found to be an important predictor of both intention to exercise and actual exercise behavior (Bozionelos & Bennett, 1999; Brickell, Chatzisarantis, & Pretty, 2006).

3. Pre-pregnancy physical activity, attitudes, subjective norms, and perceived behavioral control were expected to predict intention to exercise postpartum in both high and low self-monitors. Attitudes were expected to be the strongest predictor, followed by perceived behavioral control, subjective norms, and pre-pregnancy physical activity.

Rationale: Based on the TPB (Ajzen, 1985, 1991), these constructs and their relationships have received strong support in the field of exercise behavior in the general population (for meta-analyses, see Hagger et al., 2002 and Hausenblas et al., 1997) and in particular with pregnant women (Godin et al., 1989; Hausenblas & Symons Downs, 2004; Symons Downs, 2006; Symons Downs and Hausenblas, 2003). Positive attitudes, high subjective norm, and high perceived behavioral control have all been found to be strong predictors of the intention to exercise. Furthermore, attitude has been found to be the strongest predictor of exercise, followed by perceived behavioral control and subjective norms (for meta-analysis, see Hausenblas et al., 1997). In addition to TPB variables, past behavior has been found to be a strong predictor of exercise intention (Bozionelos & Bennett, 1999).
CHAPTER THREE: METHODOLOGY

3.1 Participants

Two hundred forty pregnant women were recruited from an obstetrician’s office in Brantford, Ontario over the months of June, July and August 2007. In a previous study examining the moderating role of self-monitoring on the effectiveness of a health-based versus appearance-based persuasive message on attitudes towards exercise in college students, Rhodes and Courneya (2000) found medium effect sizes (ES = .40 and ES = .53). An a priori sample size calculation based on an α level of .05 and a power of .80 suggested four groups of 45 participants each (Cohen, 1992) for a total of 180 participants were required. Therefore, the sample size for the present study was adequate.

Women were eligible to participate in the present study if they were over 18 years of age, to ensure all participants were able to provide informed consent. In addition, women were also required to be in their second or third trimesters of pregnancy for several reasons. One of the goals of exercising postpartum may be to regain one’s pre-pregnancy body. During the first trimester, the physical changes of pregnancy may be hardly noticeable, making concepts such as losing weight and getting back in shape less salient than for women in later stages of their pregnancy. Also, women who exercised before pregnancy tend to maintain their exercise habits throughout their first trimester, and decrease their physical activity levels starting near the beginning of the second trimester (Clissold et al., 1991; Zeanah & Schlosser, 1993). Furthermore, the TPB has been found to be most effective when the time period between when intentions are measured to when they perform the behavior is as short as possible. By excluding women who were in their first trimester, this time gap was minimized as much as possible.
Women were welcome to participate in the study regardless of the number of children that they already had. As well, women who were unable to perform physical activity for health reasons (e.g., pregnancy complications, heart conditions, paralysis, or severe muscular disorders) were excluded from the present study.

Of the 240 women originally recruited, five participants were removed for being less than 13 weeks pregnant, seven were removed for being under 18 years of age, nine were removed for being neither high nor low in self-monitoring, and one was removed as a multivariate outlier. The remaining 218 participants had a mean age of 27.9 years ($SD = 5.47$; range $= 18-41$), were in their second or third trimester of pregnancy (mean weeks pregnant $= 29.3$, $SD = 12.45$, range $= 13-40$), and the majority were in their second or subsequent pregnancy (51.4%). The majority of participants were Caucasian (81.7%), earned a family income under $60,000 (52.2%), were either married or had a common law partner (84.4%), had achieved college or technical training (39%), and were employed full-time (46.3%). Table 1 provides a summary of the demographic characteristics of the participants, while Table 2 provides information related to socio-economic status.
Table 1

Demographic Characteristics of the Participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First pregnancy</td>
<td>106</td>
<td>48.6</td>
</tr>
<tr>
<td>Second or subsequent pregnancy</td>
<td>51.4</td>
<td>51.4</td>
</tr>
<tr>
<td>Children</td>
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<td></td>
</tr>
<tr>
<td>No children</td>
<td>107</td>
<td>49.1</td>
</tr>
<tr>
<td>1</td>
<td>72</td>
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<tr>
<td>2</td>
<td>23</td>
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</tr>
<tr>
<td>3 or more</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
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<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>178</td>
<td>81.7</td>
</tr>
<tr>
<td>Asian/Asian American</td>
<td>9</td>
<td>4.1</td>
</tr>
<tr>
<td>Native/Six Nations</td>
<td>16</td>
<td>7.3</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>6.0</td>
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<tr>
<td>Marital Status</td>
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<td></td>
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<tr>
<td>Married/Common law partner</td>
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<td>84.4</td>
</tr>
<tr>
<td>Single/divorced/separated</td>
<td>34</td>
<td>15.6</td>
</tr>
<tr>
<td>Godin Leisure Time Exercise Questionnaire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pregnancy exercise levels</td>
<td>35.8</td>
<td>SD = 28.1</td>
</tr>
<tr>
<td>Current exercise levels</td>
<td>20.8</td>
<td>SD = 18.9</td>
</tr>
</tbody>
</table>

Note. *May not add up to 100% due to missing data
Table 2

**Socioeconomic Characteristics of the Participants**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%*</th>
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<tbody>
<tr>
<td><strong>Annual Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $25,000</td>
<td>40</td>
<td>18.3</td>
</tr>
<tr>
<td>$25,000-$40,000</td>
<td>41</td>
<td>18.3</td>
</tr>
<tr>
<td>$40,000-$60,000</td>
<td>34</td>
<td>15.6</td>
</tr>
<tr>
<td>$60,000-$80,000</td>
<td>37</td>
<td>17.0</td>
</tr>
<tr>
<td>$80,000-$100,000</td>
<td>32</td>
<td>14.7</td>
</tr>
<tr>
<td>Over $100,000</td>
<td>20</td>
<td>9.2</td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>14</td>
<td>6.4</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
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<tr>
<td>Graduate or professional degree</td>
<td>11</td>
<td>5.0</td>
</tr>
<tr>
<td>Bachelors</td>
<td>37</td>
<td>17.0</td>
</tr>
<tr>
<td>College or technical training</td>
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<td>39.0</td>
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<tr>
<td>Secondary school diploma</td>
<td>53</td>
<td>24.3</td>
</tr>
<tr>
<td>Some secondary school</td>
<td>31</td>
<td>14.2</td>
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<tr>
<td><strong>Employment status</strong></td>
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<td></td>
</tr>
<tr>
<td>Employed full time</td>
<td>101</td>
<td>46.3</td>
</tr>
<tr>
<td>Employed part time</td>
<td>38</td>
<td>17.4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>66</td>
<td>30.3</td>
</tr>
<tr>
<td>Student</td>
<td>12</td>
<td>5.5</td>
</tr>
</tbody>
</table>

*Note.* *May not add up to 100% due to missing data*
### 3.2 Procedures

Institutional ethics clearance was received prior to commencement of the study (see Appendix A). Permission was then obtained to recruit subjects from an obstetrician’s clinic in Brantford, Ontario. This clinic serves several obstetricians who oversee the majority of Brantford’s 1500 yearly births. The clinic provided the primary investigator with an office out of which to work and in which to store blank and completed questionnaires.

After signing in at the front desk, patients took a seat in the waiting room until they were called by a nurse into one of the nine examination rooms. Wait times varied, but were sometimes upwards of one hour. Once there were a number of women in the waiting room, the primary investigator made a general announcement using the following script in order to ensure that all subjects were approached in an identical way, “Good ______(morning/afternoon). My name is Anca Gaston and I am a master’s student at Brock University. I am currently working on my thesis and am looking at the effectiveness of brochures as a medium of information for pregnant women. In order to participate, you must be pregnant, over the age of 18, in your 2\textsuperscript{nd} or 3\textsuperscript{rd} trimester and not suffering from any health conditions that may prohibit you from exercising after the birth of your baby. If you meet these conditions, I would be very appreciative if you would consider completing my questionnaire. It will take approximately 10 to 15 minutes and your responses will be kept strictly confidential and you will not be identified in any way.”

Women who indicated that they were interested in participating were given a clipboard and a pen. The clipboard contained the Letter of Invitation and Letter of
Informed Consent (see Appendices B and C). The primary investigator was available to answer any questions. Provided that subjects returned the Letter of Consent, they were given the following documents in the stated order: questionnaire 1 [demographics questionnaire (see Appendix D), self-monitoring measure (see Appendix E), and pre-pregnancy and current exercise behavior (see Appendices F and G)]. After completing and returning these measures, they were given one brochure (health or appearance; see Appendices H and I) and questionnaire 2 [TPB questionnaire (see Appendix J)]. Subjects completed the questionnaires in the waiting room and, when they were finished, returned the clipboard directly to the primary investigator. The primary investigator remained in the area to answer any questions that may have arisen. Participants were invited to keep the letter of invitation and the brochure that they read. To maintain the subjects' anonymity, questionnaires were immediately separated from consent forms.

Based on suggestions from one of the obstetricians, women were given a debriefing form (Appendix K) following their appointment with the doctor (at which point they passed through the waiting room on their way out). To ensure that no subjects were missed, the primary investigator remained in the area at all times. The reason for waiting until the participants left the clinic before fully debriefing them is that clinic wait times are often long and women tend to talk to one another. Therefore, if the debriefing form had been given immediately following the completion of the measures, two women who had both finished the questionnaire and were sitting side by side may have started discussing the debriefing form. This discussion could have been heard by other women in the room who may have had a later appointment time and who were still working on their questionnaires.
To ensure that women did not become aware of the fact that there were two different brochures being handed out, only one type was given to subjects on any given day. For example, women approached on Monday received the health brochure, those on Tuesday the appearance brochure, those on Wednesday the health brochure, etc. This way, they could not be sitting next to someone who may have been reading a different brochure. Near the end of the data collection period, the total number of subjects who completed the health and appearance groups were counted to make sure that there were approximately equal numbers within each group.

3.3 Methods

3.3.1 Demographics questionnaire. The demographics questionnaire asked subjects to indicate their age, whether this was their first pregnancy and, if not, how many other children they had, their ethnicity, their approximate annual household income, their marital status, highest level of education achieved, and their current employment status.

3.3.2 Self-monitoring measure. Snyder and Gangestad’s (1986) self-monitoring measure contains 18 true/false questions to assess high versus low self-monitoring. A score above 9 indicates a high self-monitor and a score below 9 indicated a low self-monitor. A score of 9 indicates a person who is neither a low nor high self-monitor and women who scored 9 were excluded from the study. Examples of items include “I find it hard to imitate the behavior of other people,” and “At parties and social gatherings, I do not attempt to do or say things that others will like.” This scale has been used in similar studies (Rhodes & Courneya, 2000) and demonstrated adequate reliability in the present study ($\alpha = .79$).
3.3.3 Physical activity. The Godin Leisure-Time Exercise Questionnaire (GLTEQ; Godin & Shepherd, 1985) was used to assess physical activity levels before pregnancy as well as currently during pregnancy. The GLTEQ is a 7-day recall questionnaire designed to measure leisure-time activities. Subjects were asked to indicate how many times they engaged in each of strenuous, moderate and mild exercise over the course of the last 7 days for at least 15 minutes continuously (current), and how often they engaged in each of strenuous, moderate and mild exercise during a typical 7-day week prior to their pregnancy.

The GLTEQ was chosen for the present study because it is simple to administer, measures habitual physical activity, is reliable, valid and easy to complete quickly (Raisanen, 2007). It also yields a total activity score in arbitrary units which is calculated according to the following formula: 9 * (number of strenuous exercise episodes) + [5 * (number of moderate exercise episodes)] + [3 * (number of mild exercise episodes)]. The activity score allows for comparison between subjects. Test-retest reliabilities have ranged between $r=0.77$ to $r=0.93$ (Jacobs Jr., Ainsworth, Hartman, & Leon, 1993). Reliability and validity both compare favourably to other self-report exercise measures (Little et al., 2004). However, because it asks for the number of times per week that one engages in a particular intensity of exercise for more than 15 minutes, it does not distinguish between exercising for 20 minutes or 40 minutes at a time.

3.3.4 TPB questionnaire. The TPB questionnaire that was used for the present study (see Appendix J) was developed directly from Ajzen's recommendations (Ajzen, 2007). The TPB has been used successfully with pregnant populations (Godin et al., 1993; Hausenblas & Symons Downs, 2004; Hausenblas and Symons Downs, 2005;
Symons Downs & Hausenblas, 2004) and, specifically, in determining pregnant women’s intentions to exercise postpartum (Godin et al, 1989). It measures intention, attitudes, subjective norms and perceived behavioral control towards exercising postpartum. All of the questions were written with reference to exercising for at least 30 minutes, 3 or more times a week. This recommendation was based on work by Tully et al. (2007) showing that exercising for 30 minutes three times a week may provide equivalent benefits with exercising 5 days a week. In addition, it was the present study’s objective to suggest exercise goals which would be attainable to women at a stage in their lives where caring for a newborn may be placing increased demands on their time and energy.

According to the TPB, intention represents how much effort people are planning to exert and how hard they are willing to try to perform a behavior. Intention to exercise after giving birth was measured by a composite score of three items: (a) “After the birth of my baby, I intend to exercise for at least 30 minutes, 3 or more times a week” rated on a 7-point scale from 1 (definitely not) to 7 (definitely); (b) “I will try to exercise for at least 30 minutes, 3 or more times a week following the birth of my baby” also rated on a 7-point scale from 1 (extremely unlikely) to 7 (extremely likely); and (c) “I plan to exercise for at least 30 minutes, 3 or more times a week following the birth of my baby” also rated on a 7-point scale from 1 (definitely not) to 7 (definitely). This scale demonstrated adequate reliability (α = .95).

Attitude, the degree to which undertaking the behavior is either positively or negatively valued (Ajzen, 2007), was measured on a 7-point scale with six pairs of bipolar adjectives (pleasant-unpleasant, interesting-dull, stimulating-boring, healthy-unhealthy, good-bad, and useful-useless). These adjectives were borrowed from Godin et
al.’s (1989) study, which sought to identify which factors influence pregnant women’s intentions to exercise postpartum. Reliability was adequate ($\alpha = .89$).

Subjective norms, the social pressure that an individual perceives to engage or not engage in a particular behavior (Ajzen, 2007), was measured by a composite score of eight items. Examples include “Most people who are important to me think that ____ exercise for at least 30 minutes, 3 or more times a week after the birth of my baby” rated on a 7-point scale from 1 (I should not) to 7 (I should), “It is expected of me that I exercise for at least 30 minutes, 3 or more times a week after the birth of my baby” rated on a 7-point scale from 1 (extremely unlikely) to 7 (extremely likely), and “The people in my life whose opinions I value would ____ of my exercising for at least 30 minutes, 3 or more times a week after the birth of my baby,” rated on a 7-point scale from 1 (disapprove) to 7 (approve). This scale demonstrated adequate reliability ($\alpha = .72$).

Perceived behavioral control was assessed using the following four questions as suggested by Ajzen (2007): a) “For me to exercise for at least 30 minutes, 3 or more times a week after the birth of my baby would be ____” rated on a 7-point scale from 1 (impossible) to 7 (possible); b) “If I wanted to I could exercise for at least 30 minutes 3 or more times a week after the birth of my baby,” rated on a 7-point scale from 1 (definitely false) to 7 (definitely true); c) “How much control do you believe you have over exercising for at least 30 minutes 3 or more times a week after the birth of your baby,” rated on a 7-point scale from 1 (no control) to 7 (complete control); and d) “It is mostly up to me whether or not I exercise for at least 30 minutes 3 or more times a week after the birth of my baby,” rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Perceived behavioral control demonstrated adequate reliability ($\alpha = .81$).
3.3.5 *Manipulation check.*

In order to ensure that subjects did indeed read the enclosed brochure, they were asked the following open-ended question at the end of Questionnaire 2: “According to the brochure you read, what were two benefits of postpartum exercise?”

3.3.6 *Brochures*

A persuasive message about the benefits of postpartum exercise was delivered to participants via a brochure (see Appendix H and Appendix I). Half the participants received a health brochure and the other half an appearance brochure. As part of the creation of the brochure, four experts from the fields of health and exercise psychology and nursing were consulted in order to ensure that each brochure clearly and effectively conveyed the health and appearance benefits of exercise, and that the messages were different from one another.

3.3.6.1 *Appearance brochure.* This six-panel brochure was entitled “Exercising after the Birth of Your Baby,” with the subheading, “An informational brochure about losing weight and looking great after the birth of your baby.” The brochure featured 5 photos of women incorporating their babies or young children into their exercise routine. Permission was received for the use of all of these photos and due credit was given in the form of a credit on the photo as well as a listing of the corresponding business on the back panel of the brochure. Two of the photos (cover and inside middle panel) were taken by the primary investigator. The criteria for choosing photos for the appearance brochure included: a) subjects should be wearing clothing that emphasized appearance (e.g., a tank top or sports bra); b) subjects should look fit; c) subjects should not be overweight; and d)
subjects should be shown exercising with their baby (e.g., jogging with their baby in a stroller), or at least have their baby in the background.

The first panel that women saw as they unfolded the brochure was entitled, “Looking after Your Body.” Its main goal was to explain that having a baby and looking after a newborn is hard work and that it is important that women look after their own health by making sure they exercise regularly, eat a healthy diet, and get plenty of sleep. The purpose of the panel was to introduce the concept of postpartum exercise and the idea that it is beneficial. The middle panel outlined, in bullet form, eight appearance benefits that women can enjoy if they exercise as soon as they are able after the birth of their baby. The benefits were the following:

- Lose weight and return to your pre-pregnancy weight more quickly
- Build stronger muscles that look tighter and more toned
- Regain your pre-pregnancy body
- Burn fat and flatten your tummy
- Improve circulation leading to improved skin quality and a healthy glow
- Improve your mood and self-esteem and avoid the body image dissatisfaction that normally peaks in the postpartum period
- Feel and look more attractive

The following two panels included suggestions for getting started and maintaining a healthy exercise routine. Brisk walking was recommended as an excellent way to start. The concept of maintaining one’s ‘target heart rate’ was then introduced. The next panel included suggestions for incorporating baby into the women’s exercise routine. Examples
included: investing in a jogging stroller or a child trailer that attaches to a bicycle and joining a ‘mommy and me’ fitness class.

The back panel was a listing of online resources about postpartum exercise that mothers may wish to consult. Among others, examples include The American College of Obstetricians and Gynecologists (2007) and The Society of Obstetricians and Gynecologists of Canada (2003). It also included those websites which granted their permission for the use of their photos.

3.3.6.2 Health brochure. This six-panel brochure was entitled “Exercising after the Birth of Your Baby,” with the subheading, “An informational brochure about the health benefits of exercise during the postpartum period.” As with the appearance brochure, this brochure featured 5 photos of women incorporating their babies or young children into their exercise routine. Permission was received for the use of all of these photos and due credit was given in the form of a credit on the photo as well as a listing of the corresponding business on the back panel of the brochure. The criteria for choosing photos for the health brochure included: a) subjects should be wearing clothing that de-emphasized appearance (e.g., a baggy T-shirt); b) subjects should convey a general image of health and well-being; c) subjects should not be overweight; and d) subjects should be shown exercising with their baby (e.g., jogging with their baby in a stroller), or at least have their baby in the background.

The first panel that women saw as they unfolded the brochure was entitled, “Looking after Your Health.” This panel was virtually identical to that in the appearance brochure, except for stating that exercise can help you get “back in shape” (as opposed to
“help you regain your pre-pregnancy body”) and aimed to introduce the concept that postpartum exercise is healthy.

The middle panel outlined, in bullet form, eight health benefits that women can enjoy if they exercise as soon as they are able after the birth of their baby. The benefits were the following:

- Increase aerobic fitness and strength
- Prevent heart disease, stroke and bone loss associated with breastfeeding
- Improve your mood and self-esteem and prevent postpartum depression
- Lower high blood pressure and improve cholesterol levels
- Boost your immune system
- Reduce the risk of several types of cancer
- Improve your body composition
- Increase your energy level

The last two panels were identical to those of the ‘Appearance brochure,’ and included exercise suggestions. The resources panel was also similar to that of the Appearance brochure, including online resources such as The American College of Obstetricians and Gynecologists (2007) and The Society of Obstetricians and Gynecologists of Canada (2003). It also included websites which granted their permission for the use of their photos.

3.4 Statistical analysis

In order to address the research questions, the following data analysis strategy was used.
Research question 1. In order to determine whether a health or appearance based message had a greater effect on women’s intentions to exercise postpartum, attitudes towards exercise, subjective norms for exercise, and perceived behavioral control for exercise, and whether the effectiveness of these types of messages was moderated by the personality trait of self-monitoring, a 2 (message type: health versus appearance) x 2 (self-monitoring: high versus low) MANOVA was conducted with attitude, subjective norms, perceived behavioral control, and intention to exercise serving as the dependent variables.

This statistical procedure was chosen based on Baron and Kenny’s (1986) recommendations. These authors define a moderator as a “qualitative (e.g., sex, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable” (p. 1174). In the present analysis, self-monitoring was considered to potentially affect the direction and/or strength of the relation between message type and the scores on TPB variables. Baron and Kenny (1986) identify several cases which may involve testing for a moderator variable. Our case corresponds to Case 1, in which both the moderator and the independent variables are categorical variables and a 2 X 2 MANOVA is the analysis of choice, with moderation being indicated by a significant interaction.

Research question 2. To determine whether pre-pregnancy exercise or current exercise behavior was related to attitudes, subjective norms, perceived behavioral control or intention to exercise, Pearson correlation co-efficients were calculated between scores on the two versions of GLTEQ (current and pre-pregnancy) and the TPB subscales.
Research question 3. Two hierarchical regression analyses by self-monitoring status were run in order to determine whether pre-pregnancy physical activity, attitudes, subjective norm, and perceived behavioral control predicted intention to exercise postpartum, and their relative importance to that prediction. Pre-pregnancy physical activity was entered in the first block, followed by attitudes and subjective norm in the second block, and finally by perceived behavioral control in the third block.
CHAPTER FOUR: RESULTS

4.1 Self-monitoring

Self-monitoring status was determined using Snyder and Gangestad’s (1986) Self-monitoring Scale, which contains 18 true/false questions. A score of 10 or higher indicates a high self-monitor, and a score of 8 or less indicates a low self-monitor. A one-way ANOVA revealed that high and low self-monitors scored significantly differently on the self-monitoring scale ($F(1, 216) = 652.37, p < .001$). Low self-monitors reported a mean score of 5.58 ($SD = 1.94$), whereas high self-monitors reported a mean score of 12.65 ($SD = 2.15$).

4.2 Manipulation check

In order to ensure that the manipulation was successful (i.e., that the women in the health group identified health benefits of postpartum exercise, and the women in the appearance group identified appearance benefits of postpartum exercise), all women were asked to identify two benefits of postpartum exercise that were described in the brochure they read. All participants correctly identified two benefits corresponding to their group (i.e., health or appearance message), suggesting that the manipulation was successful and that the readers did indeed understand the message that was delivered.

4.3 Treatment of missing data

The quantitative data analysis software program Statistical Package for the Social Sciences (SPSS) version 15.0 was used for all data analyses. Data was entered and then screened for data entry errors and missing values by examining univariate frequencies. Less than 1% of the dataset was missing. All missing values were part of the demographic information and the missing data was not included in further analysis.
Data was then screened to ensure that subjects met the inclusion criteria of being 18 years of age or older, in their second or third trimester of pregnancy, and either a low or high self monitor. Five cases were deleted for being less than 13 weeks pregnant and 7 cases were deleted for being under 18 years of age. Nine cases were deleted for being neither a high nor a low self monitor (i.e., a score of 9 on the self-monitoring measure). This screening resulted in a final sample size of 218 women.

4.4 Outliers

The entire dataset was screened for both univariate and multivariate outliers. Potential univariate outliers were defined as cases whose z-scores exceeded 3.29 ($p < .001$, two-tailed test) as suggested by Tabachnick and Fidell (2007). An examination of attitudes, subjective norms, perceived behavioral control and intention scores revealed three potential outliers, one for attitudes (-3.41), one for subjective norms (-3.97), and one for perceived behavioral control (-3.45). However, they were all valid scores, and they were within 1 point of next lowest score in the data set. Given that group size was already at a minimum and that these scores were not much more extreme than other low cases, it was decided to retain the scores.

The data for attitudes, subjective norms, perceived behavioral control and intention was then inspected for multivariate outliers by assessing Mahalanobis' distance and evaluating it against $\chi^2$ with degrees of freedom equal to the number of variables of interest ($n = 4$) at $p < .001$ (Tabachnick & Fidell, 2007). According to this criteria, any case with a Mahalanobis distance $\geq 18.47$ was deemed a multivariate outlier. One such case was identified (MD = 21.91, $p < .001$). Examination of this case showed a very low
score on subjective norms and higher scores on the other variables. Therefore, this case was deleted from further analysis.

4.5 Normality of sampling distribution: skewness and kurtosis

Attitudes, subjective norms, perceived behavioral control, and intention were all assessed for normality by examining skewness and kurtosis values by group. The corresponding z-score for skewness and kurtosis for each variable by group was compared against the \( z_{\text{crit}} \) of 3.29 \( (p < .001) \). Skewness and kurtosis significance tests were significant for several variables \( (p > .001) \). For the low self-monitoring group who received the health message, the kurtosis score for subjective norms was significant \( (z_k = 3.981, p < .001) \). For the group high in self-monitoring who received the health message, all values were non-significant with the exception of skewness for perceived behavioral control \( (z_k = 4.156, p < .001) \). For the group low in self-monitoring who received the appearance message, all values were non-significant with the exception of skewness for attitude \( (z_k = -3.364, p < .001) \). For the group high in self-monitoring who received the appearance message, all values were non-significant. Given that there are no known transformations for kurtosis, and that the scores for only two variables exhibited skewness, no transformations were applied.

4.6 Linearity

According to Tabachnick and Fidell (2007), linearity is the assumption that two variables are related to each other in approximately a straight line relationship. For the present research, this assumption was assessed by visually inspecting bivariate scatterplots by group for all possible combinations of variables. There was no evidence of a curvilinear or any other relationship, therefore this assumption was met.
4.7 Homogeneity of variance

Homogeneity of variance refers to the assumption that, for all groups, the variability in each dependent variable is approximately the same (Tabachnick & Fidell, 2007). As suggested by Tabachnick and Fidell (2007), it was assessed using $F_{\text{max}}$ in conjunction with sample size ratios. Group sizes were relatively equal, well within the recommended ratio of 4 to 1 (Tabachnick & Fidell, 2007). An acceptable ratio of the largest to smallest cell variance for intention, attitude, subjective norms, and perceived behavioral control was set at 10 or less (Tabachnick & Fidell, 2007). All variables had an acceptable $F_{\text{max}}$ (range 1.05 to 1.705), so the assumption of homogeneity of variance was met.

4.8 Multicollinearity

When variables are highly correlated ($r \geq .90$) they may contain redundant information (Tabachnik & Fidell, 2007). Pearson correlations by group were run to investigate multicollinearity. Results of the analysis revealed no such highly correlated variables, suggesting multicollinearity was not a problem.

4.9 Descriptive statistics

Descriptive statistics were calculated by group for intention, attitude, subjective norms, and perceived behavioral control. An examination of these values reveals that they were relatively high in comparison to the midpoint of the scales (see Table 3).
Table 3

Means and Standard Deviations for TPB Variables by Self-monitoring Status and Message Type

<table>
<thead>
<tr>
<th>Variable</th>
<th>Low self-monitors</th>
<th>High self-monitors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health (n = 56)</td>
<td>Appearance (n = 56)</td>
</tr>
<tr>
<td>Intention</td>
<td>5.54 (1.42)</td>
<td>5.48 (1.47)</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>4.82 (0.96)</td>
<td>4.88 (0.98)</td>
</tr>
<tr>
<td>Attitude</td>
<td>5.84 (1.02)</td>
<td>5.80 (0.99)</td>
</tr>
<tr>
<td>PBC</td>
<td>5.47 (1.18)</td>
<td>5.44 (1.30)</td>
</tr>
</tbody>
</table>

Note. PBC = Perceived behavioral control.

In addition, correlations were calculated between all study variables for the entire sample and are shown in Table 4.
Table 4

*Bivariate Correlations between all Study Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intention</td>
<td>--</td>
<td>.54**</td>
<td>.61**</td>
<td>.68**</td>
<td>.19**</td>
<td>.14*</td>
</tr>
<tr>
<td>2. SN</td>
<td>--</td>
<td>.45**</td>
<td>.45**</td>
<td>.19**</td>
<td>.20**</td>
<td></td>
</tr>
<tr>
<td>3. PBC</td>
<td>--</td>
<td>.50**</td>
<td>.17*</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Attitude</td>
<td>--</td>
<td>.11</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Pre-Pregnancy PA</td>
<td>--</td>
<td></td>
<td>.61**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Current PA</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. SN = Subjective norms; PBC = Perceived behavioral control; PA = Physical activity.
*p<.05; **p<.01

4.10 Hypothesis testing

4.10.1 Research Question 1: Does a health or appearance- based message in a brochure have a greater effect on pregnant women’s intentions to exercise postpartum, attitudes to exercise, subjective norms for exercise, and perceived behavioral control for exercise, and is the effectiveness of these types of messages moderated by the personality trait of self-monitoring?

To answer the main research question, a MANOVA was run to test for the main effects of self-monitoring and message as well as their interaction. The dependent variables were intention, attitudes, subjective norms, and perceived behavioral control. The fixed factors were message type and self-monitoring. There was no effect for
message type \(p = .927, \eta=.004\), self-monitoring group \(p = .135, \eta=.033\) or their interaction \(p = .888, \eta=.005\).

4.10.2 Research Question 2: Is pre-pregnancy physical activity or current physical activity behavior related to attitudes, subjective norms, perceived behavioral control or intention to exercise?

Pearson correlations were calculated to examine the relationships between pre-pregnancy physical activity levels, current physical activity levels, attitudes, subjective norms, perceived behavioral control, and intention. Small positive relationships were found between pre-pregnancy physical activity levels and subjective norms \(r = .194, p = .004\), and intention \(r = .185, p = .006\), and pre-pregnancy physical activity levels and perceived behavioral control \(r = .166, p = .014\). Further, a small positive relationship was found between current physical activity levels and subjective norm \(r = .201, p = .003\) as well as between current physical activity levels and intention \(r = .142, p = .036\). See Table 4 for all correlations. It should be noted that all relationships were positively correlated. Thus, higher levels of pre-pregnancy exercise and current exercise were associated with more positive attitudes, more positive subjective norms, higher perceived behavioral control, and higher intention to exercise postpartum.

4.10.3 Research Question 3: Does pre-pregnancy physical activity, attitudes, subjective norm, and perceived behavioral control predict intention to exercise postpartum, and what is their relative contribution to that prediction?

To examine the relative predictive abilities of attitudes, subjective norms and perceived behavioral control on intention, two hierarchical regressions were conducted, one for each self-monitoring group. Prior to conducting the analysis, tests of the
assumptions of regression were conducted. The ratio of cases to independent variables should be at least 5:1, and ideally 20:1 (Cohen & Cohen, 1983). With four independent variables (pre-pregnancy PA, attitudes, subjective norms, perceived behavioral control), a minimum of $20 \times 4 = 80$ cases for each group (i.e., low and high self-monitors) was required. Given that there were 112 and 106 subjects in each group, this assumption was met. Further, regression requires that the independent variables should not be highly correlated (i.e., $r \geq .90$). Correlations were calculated for all variables for each self-monitoring group (see Table 5). The largest correlation was .71, therefore this assumption was met.

To determine whether there were any significant differences between correlations based on self-monitoring status, z-scores were calculated for all significant correlations. At $\alpha = .05$, intention-attitude yielded a z score of .82, intention- perceived behavioral control a score of .97, and intention- subjective norms a score of .02. Given that all values were below $z_{crit} = .98$, there were no significant differences between correlations based on self-monitoring status.
Table 5

*Background Correlations between all Study Variables by Self-monitoring Status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Intention</td>
<td>--</td>
<td>.54**</td>
<td>.67**</td>
<td>.65**</td>
<td>.12</td>
<td>.14</td>
</tr>
<tr>
<td>2. SN</td>
<td>.54**</td>
<td>--</td>
<td>.49**</td>
<td>.48**</td>
<td>.08</td>
<td>.14</td>
</tr>
<tr>
<td>3. PBC</td>
<td>.57**</td>
<td>.42**</td>
<td>--</td>
<td>.52**</td>
<td>.20*</td>
<td>.12</td>
</tr>
<tr>
<td>4. Attitude</td>
<td>.71**</td>
<td>.41**</td>
<td>.48**</td>
<td>--</td>
<td>.14</td>
<td>.15</td>
</tr>
<tr>
<td>5. Pre-Pregnancy PA</td>
<td>.27**</td>
<td>.32**</td>
<td>.13</td>
<td>.09</td>
<td>--</td>
<td>.60**</td>
</tr>
<tr>
<td>6. Current PA</td>
<td>.15</td>
<td>.26**</td>
<td>.05</td>
<td>.06</td>
<td>.66**</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* SN = Subjective norms; PBC = Perceived behavioral control; PA = Physical activity. Values above the diagonal are for high self-monitors and values below the diagonal are for low self-monitors.

*p < .05; **p < .01

Two hierarchical multiple regressions were conducted to determine the predictive utility of pre-pregnancy physical activity, attitudes, subjective norms, and perceived behavioral control on intention for each self-monitoring group. Consistent with recommendations by Bozionelos and Bennett (1999), pre-pregnancy physical activity level was entered in the 1st block (as a measure of past behavior), attitude and subjective norms were entered in the 2nd block, and perceived behavioral control was entered in the 3rd block. For high self-monitors, results of the analysis demonstrated that all TPB variables significantly predicted intention ($R^2_{adj} = .58$, $F(4, 99) = 36.06, p < .001$). Pre-pregnancy physical activity was not a significant predictor. Among the three TPB
variables, examination of the beta coefficients indicated that perceived behavioral control and subjective norm were the strongest predictors of intention, followed by attitude (see Table 6).

Table 6

Summary of Hierarchical Regression Analysis for Variables Predicting Intention to Exercise Postpartum for High Self-monitors (n = 106)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R^2\text{change}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pregnancy PA</td>
<td>.00</td>
<td>.00</td>
<td>-.02</td>
<td>.02</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>.30</td>
<td>.13</td>
<td>.17*</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>.64</td>
<td>.13</td>
<td>.38*</td>
<td>.48*</td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.52</td>
<td>.11</td>
<td>.38*</td>
<td>.09*</td>
</tr>
</tbody>
</table>

*Note. PA = Physical activity; SN = Subjective norms; PBC = Perceived behavioral control.

*p < .05

For low self-monitors, results of the hierarchical regression analysis demonstrated all four independent variables significantly predicted intention ($R^2_{\text{adj}} = .62, F(4, 109) = 46.80, p < .001$). Examination of the beta coefficients indicated that attitude was the strongest predictor of intention, followed by perceived behavioral control, subjective norms and pre-pregnancy physical activity (see Table 7).
Table 7

Summary of Hierarchical Regression Analysis for Variables Predicting Intention to Exercise Postpartum for Low Self-monitors (n = 112)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE_B$</th>
<th>$\beta$</th>
<th>$R^2_{change}$</th>
</tr>
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<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pregnancy PA</td>
<td>.00</td>
<td>.00</td>
<td>.13*</td>
<td>.07*</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>.72</td>
<td>.10</td>
<td>.51*</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>.28</td>
<td>.10</td>
<td>.19*</td>
<td>.52*</td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.27</td>
<td>.08</td>
<td>.24*</td>
<td>.04*</td>
</tr>
</tbody>
</table>

Note. PA = Physical activity; SN = Subjective norms; PBC = Perceived behavioral control

*p < .05

4.11  Exploratory analyses: Influence of previous pregnancies

4.11.1  Exploratory analysis 1: Do pregnant women's attitudes, subjective norms, perceived behavioral control or intention to exercise postpartum differ based on parity (whether a woman is pregnant with her first versus second or subsequent child)?

Because previous work (Godin et al., 1989) has suggested that having previous children may impact TPB beliefs, this question was addressed as part of an exploratory analysis. Women were categorized based on whether they had previous children or not into one of 2 groups: pregnant with their first child ($n = 106$) or pregnant with a second or subsequent child ($n = 112$). A MANOVA was run to test whether parity had any effect on
women’s attitudes, subjective norms, perceived behavioral control or intention to exercise postpartum. The dependent variables were intention, attitudes, subjective norms, and perceived behavioral control, and the fixed factor was parity. There were significant differences in women’s attitudes ($F(1, 216) = 4.32, p = .04$), perceived behavioral control ($F(1, 216) = 6.01, p = .02$), and intention to exercise postpartum ($F(1, 216) = 5.43, p = .02$) based on parity group. Women pregnant with their first child reported more positive attitudes ($M = 6.03, SD = .92$), higher perceived behavioral control ($M = 5.76, SD = 1.10$), and higher intention to exercise postpartum ($M = 5.73, SD = 1.33$) as compared to women pregnant with their second or subsequent child ($n = 112$), who reported more negative attitudes ($M = 5.76, SD = .96$), lower perceived behavioral control ($M = 5.37, SD = 1.22$), and lower intention to exercise postpartum ($M = 5.28, SD = 1.53$).

4.11.2 Exploratory analysis 2: What is the relationship between women’s pre-pregnancy physical activity or current physical activity level and their attitudes, subjective norms, perceived behavioral control or intention to exercise for those pregnant with their first child, or with their second or subsequent child?

Pearson correlations were calculated to examine the relationships between pre-pregnancy physical activity levels, current physical activity levels, attitudes, subjective norms, perceived behavioral control, and intention based on parity. For women pregnant with their first child, moderate positive relationships were found between pre-pregnancy exercise levels and intention ($r = .29, p = .003$) and between pre-pregnancy exercise levels and subjective norm ($r = .32, p = .001$) and small positive relationships were found between current exercise levels and intention ($r = .19, p = .047$) and between current exercise levels and subjective norms ($r = .24, p = .012$). Among women pregnant with
their second or subsequent child, however, there were no significant correlations between pre-pregnancy exercise levels and TPB variables or between current exercise levels and TPB variables.

4.11.3 Exploratory analysis 3: Do attitudes, subjective norms, perceived behavioral control, and pre-pregnancy physical activity levels predict intention to exercise postpartum, and what is their relative contribution to that prediction based on parity?

To examine the relative predictive abilities of attitudes, subjective norm, perceived behavioral control, and pre-pregnancy exercise level on intention, two hierarchical regressions were conducted based on parity. Pre-pregnancy physical activity was entered in the first block, followed by attitudes and subjective norms in the second, and finally by perceived behavioral control in the third.

For women pregnant with their first child, all three combinations significantly predicted intention to exercise (Block 1 ($F (1, 104) = 9.40, p = .003$); Block 2 ($F (3, 102) = 42.68, p = .000$); Block 3 ($F (4, 101) = 39.87, p = .000$). For women pregnant with their first child, attitude was the strongest predictor of intention to exercise postpartum, followed by perceived behavioral control, and pre-pregnancy exercise levels (see Table 8).
Table 8

Summary of Hierarchical Regression Analysis for Variables Predicting Intention to Exercise Postpartum for Women Pregnant with their First Child (n = 106)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R² change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pregnancy PA</td>
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<td>.18*</td>
<td>.08*</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>.73</td>
<td>.11</td>
<td>.50*</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>.16</td>
<td>.10</td>
<td>.11</td>
<td>.47*</td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.33</td>
<td>.09</td>
<td>.27*</td>
<td>.06*</td>
</tr>
</tbody>
</table>

Note. PA = Physical activity; SN = Subjective norms; PBC = Perceived behavioral control.

*p < .05

For women pregnant with their second or subsequent child, only the second (attitude and subjective norm) and third (attitude, subjective norm, perceived behavioral control) blocks significantly predicted intention to exercise (Block 1 (F(1, 110) = .89, p = .35; Block 2 (F(3, 108) = 39.18, p = .000; Block 3 (F(4, 107) = 37.07, p = .000). Pre-pregnancy physical activity level was no longer significant (β = .09, p = .35) after accounting for the TPB variables. The strongest predictor of intention to exercise postpartum was attitude, followed by perceived behavioral control, and subjective norms (see Table 9).
Table 9

*Summary of Hierarchical Regression Analysis for Variables Predicting Intention to Exercise Postpartum for Women Pregnant with their Second or Subsequent child (n =112)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R^2 change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-pregnancy PA</td>
<td>.00</td>
<td>.00</td>
<td>-.03</td>
<td>.01</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>.65</td>
<td>.12</td>
<td>.40*</td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>.40</td>
<td>.13</td>
<td>.24*</td>
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</tr>
<tr>
<td>Block 3</td>
<td></td>
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</tr>
<tr>
<td>PBC</td>
<td>.38</td>
<td>.10</td>
<td>.30*</td>
<td>.06*</td>
</tr>
</tbody>
</table>

*Note. PA = Physical activity; SN = Subjective norms; PBC = Perceived behavioral control.*

*p < .05*
CHAPTER FIVE: DISCUSSION

The present study aimed to examine the effectiveness of two types of messages (appearance and health-based) on intention to exercise after giving birth in two groups of pregnant women (low and high self-monitors) using the TPB as a theoretical basis. It was hypothesized that those high in self-monitoring would report more positive attitudes as well as higher subjective norms, perceived behavioral control and intention to exercise in response to an appearance-based message, and that those low in self-monitoring would report more positive attitudes as well as higher subjective norms, perceived behavioral control and intention to exercise in response to a health-based message. Even though a manipulation check suggested that participants understood the main message of the brochure, and those messages were different, this hypothesis was not supported, suggesting that self-monitoring did not moderate the effectiveness of health versus appearance messages on pregnant women’s intentions to exercise postpartum. The reported effect sizes for message type, self-monitoring status and their interaction were very small, providing further support for this contention.

Further, this study sought to examine whether pre-pregnancy physical activity or current physical activity levels were related to attitudes, subjective norms, perceived behavioral control or intention to exercise. Small positive relationships were found between pre-pregnancy physical activity levels and subjective norms, intention, and perceived behavioral control, and between current physical activity levels and subjective norms and intention. Thus, higher levels of pre-pregnancy exercise and current exercise were associated with more positive subjective norms, higher perceived behavioral control, and higher intentions.
Finally, this study also sought to examine whether attitudes, subjective norms, and perceived behavioral control predicted intention to exercise postpartum, as well as their relative importance to that prediction. The multiple regression analyses demonstrated that for both high and low self-monitors, the three independent variables significantly predicted intention to exercise postpartum, accounting for approximately 58%-62% of the variance in intention. Although all predictors were significant at the $p < .001$ level, examination of the beta coefficients indicated that for low self-monitors, attitude accounted for the greatest variance in intention, followed by perceived behavioral control and subjective norms, whereas for high self-monitors, perceived behavioral control was the biggest predictor, followed by attitudes and subjective norms.

5.1 Descriptive statistics

All TPB variables were assessed on a 7-point Likert scale with 1 indicating the lowest level of intention, most negative attitude, least support from important others, and least sense of control over one’s exercise behavior. Based upon the 7-point scoring scales provided, the present means (5.5 for intention, 4.94 for subjective norms, 5.56 for perceived behavioral control, and 5.89 for attitudes) were all relatively high and represented fairly positive attitudes, strong intentions, subjective norms and a high degree of perceived behavioral control.

An examination of descriptive statistics for intention, attitude, perceived behavioral control, and subjective norms obtained in the present study reveals scores that are consistent with previous research using the TPB in similar populations (Godin et al., 1989; Hausenblas & Downs, 2004; Symons Downs & Hausenblas, 2003). In addition, the relative magnitude of each score in the present study is consistent with past research, with
the highest scores being for attitudes and followed by intention. Depending upon how subjective norms and perceived behavioral control were operationalized, there is less consistency among studies regarding which of these variables had a higher score.

5.2 **Effectiveness of a health versus appearance brochure and the moderating role of self-monitoring**

The first research question asked whether a health or appearance based message in a brochure format had a greater effect on pregnant women’s intentions to exercise postpartum, attitudes to exercise, subjective norms for exercise, and perceived behavioral control for exercise, and whether the effectiveness of these types of messages was moderated by the personality trait of self-monitoring. The present study found that, contrary to the hypothesis, there was no effect for message type, self-monitoring group or their interaction.

These findings are inconsistent with previous research. Only one previous study has examined whether self-monitoring status moderates the effectiveness of a health versus appearance message on intention to exercise. Using a sample of university students, Rhodes and Courneya (2000) found no significant differences for the main effects of self-monitoring or message content, which is consistent with the present findings. These authors did, however, find the interaction of self-monitoring and message type to be significant, although they examined only attitude as the dependent variable.

There are several differences that may explain this contradictory finding. For example, Rhodes and Courneya (2000) used a sample of university students, as well as a written paragraph rather than a brochure. Self-monitoring may have moderated the message type in university students for several reasons. Firstly, they were in an
environment in which they were accustomed to the research process and may have possibly even participated in other research studies. As a result, they could have been more likely to correctly guess what the researchers were looking for. This hypothesis may be even more likely, given that the essay format could have made it easier for students to determine the purpose of the study and respond accordingly. Secondly, given their young age and the environment they were in, students may be more influenced by appearance or self-presentational concerns. Finally, the students’ age and stage in life may have contributed to exercise being a more salient and interesting activity, resulting in stronger responses and greater intentions to exercise. In comparison to the majority of women who are pregnant, most students are younger, may have more free time, usually do not have other children or a partner to look after, and often have easier access to exercise facilities (low-cost gyms are available on all campuses and do not require travel to and from the facility). In addition, more university students engage in physical activity as compared to pregnant women. Whereas research demonstrates that approximately 60% of pregnant women are inactive (for review see Poudevigne & O’Connor, 2006), only 23% of university students are inactive (Haase, Steptoe, Sallis, & Wardle, 2004). Therefore, even if they themselves are not active, students are more likely than pregnant women to have friends who participate in physical activity or go to the gym on a regular basis, making the prospect of exercise a pleasant and familiar notion.
5.3 Explanations for lack of effect of message type, self-monitoring, or their interaction

5.3.1 Lack of effect for message type

The fact that there was no effect based on message type may be explained by the possibility that the two brochures were too similar to each other. The brochures were identical except for their titles, the photographs contained in them, and one single middle panel which listed 8 benefits (appearance or health) of exercise. These similarities were important to ensure that any differences were due specifically to the nature of the message. However, the fact that the rest of the text was identical in both brochures may have made them too similar for an effect to be observed.

It is also possible that brochures may not be the most effective medium for promoting healthy behavior change. This may not be surprising, given that other studies which have found a significant effect for message type used either essays or videos. For example, Rhodes and Cournaya (2000) used a short essay to test the effectiveness of a health versus appearance-based message on motivating students to exercise, as did Jones and Leary (1994) to promote sun-safe behaviors. In comparison to brochures, essays may convey their message more directly, as they are more likely to include only the most relevant information and not pictures. Furthermore, Graham, Prapavessis, and Cameron (2006) found that compared to controls who received no message, subjects who viewed an informational DVD about the role of exercise in reducing colon cancer risk reported higher intentions to exercise after the treatment as compared to controls. Similarly, Maddison, Prapavessis, and Clatworthy (2006) found that patients scheduled for anterior cruciate ligament reconstruction who watched a modeling video reported lower
perceptions of expected pain and greater self-efficacy to perform rehabilitation tasks than controls.

Videos may be more effective than brochures for several reasons. Firstly, they are capable of conveying more information than a brochure. For example, even a 5-minute video will convey more information than a brochure. In addition, the potential for animations, video and graphics can enhance the nature of the material that can be covered. Secondly, it is less possible for subjects to ‘skim through’ a video, although they can easily do this with a brochure. Therefore, people may pay attention to more of the message. Thirdly, in the case of a video, the potential of including experts may increase the credibility of the information. More research is needed to determine whether videos or text are indeed a more effective way of delivering health information as compared to brochures.

However, it should be noted that brochures are cost-efficient and easy to reproduce, making them a practical choice for disseminating information on a variety of topics in locations such as doctors offices. In comparison, videos have two distinct disadvantages: 1) they are too expensive to hand out for free on a mass scale; and 2) they cannot be viewed while one is waiting for an appointment, but need to be taken home and played at a later time, and they take longer to view, requiring a greater time commitment on the part of the observer. Essays have their limitations as well, namely the lack of graphics and lack of visual appeal make them less likely to be picked up and read.

Finally, the high scores for attitudes, subjective norms, perceived behavioral control and intention to exercise postpartum may also be attributable to the fact that health and fitness may already have been salient to the women filling out the
questionnaires due to the environment they were in at the time. The waiting room featured several posters promoting health behaviors including exercise, and magazines such as “Fit Pregnancy” and “Parenthood” were provided as reading material. It is very possible that in such an environment, participants were already thinking about health-related behaviors and even exercise before being approached by the primary investigator. Therefore, the lack of effect of message type may be a reflection that women already had positive attitudes, subjective norms, perceived behavioral control, and intention for exercise before reading the brochure.

5.3.2. Lack of moderating effect for self-monitoring status

Based on research supporting the view that individuals high in self-monitoring place a greater emphasis on physical appearance as compared to individuals who are low in self-monitoring (Snyder, Berscheid, & Matwychuk, 1988), it was hypothesized that women high in self-monitoring would be more responsive to an appearance message than a health message. There are several reasons why this hypothesis was not supported.

Firstly, it is possible that both brochures actually targeted the self presentational concerns of women. For example, women’s desire to be healthy during pregnancy and the postpartum, as well as their concern for their baby’s health may also result, at least in part, from concerns that others see them as healthy and caring mothers. Therefore both brochures may have targeted self-presentational concerns.

Alternatively, the main benefits of exercise focused on in the appearance brochure were weight loss and return to pre-pregnancy shape, issues that have implications not only for appearance but also for health. It is highly likely that many women are warned by their obstetrician about the dangers of gaining excessive weight as well as educated
about the health benefits of returning to pre-pregnancy weight after the birth of their baby. Overweight and obesity are not only appearance concerns, but can also lead to serious health consequences such as high blood pressure, osteoarthritis, high cholesterol, Type 2 diabetes, and coronary heart disease (Centers for Disease Control and Prevention, 2007). For these reasons, participants may have perceived that the appearance brochure was actually promoting improved health for themselves, and, consequently, their baby. Rather than being motivated by self-presentational concerns, engaging in physical activity during pregnancy and motherhood may be a result of a woman’s real concern about her own and her baby’s health and the desire to give her baby the best possible start in life.

Finally, there may be limitations as to how self-monitoring is operationalized. For example, although the present study was mostly concerned with the tendency of those high in self-monitoring to be more concerned about their appearance, an examination of the 18 questions that make up Snyder and Gangestad’s self-monitoring scale does not reveal any questions that directly address concern with appearance. Furthermore, although self-monitoring is considered a trait, it may be that during pregnancy other concerns may take precedence. For example, regardless of self-monitoring status, social desirability may be more important during pregnancy given a woman’s concern with being seen as a good mother (Alvik, Haldorsen, Groholt, & Lindemann, 2006; Emhart, Morrow-Tlucak, Sokol, & Martier, 1988; Ford, Tappin, Schluter, & Wild, 1997; Parna et al., 2005). Social desirability may also influence an individual’s willingness to honestly answer some of the questions on the self-monitoring scale. For example, in order to be classified as a high self-monitor, a person would have to answer ‘True’ to items such as
“I may deceive people by being friendly when I really dislike them,” or “I’m not always the person I appear to be.” For people with strong religious, moral, or ethical views, such statements may seem incompatible with their philosophical position and may make them unwilling to answer as truthfully as possible. Therefore, high social desirability or self-monitoring may in fact lead people to respond as if they were low in self-monitoring, regardless.

5.4 Relationship of past and current physical activity on attitudes, subjective norms, perceived behavioral control and intention

Research question 2 examined whether pre-pregnancy exercise or current exercise behavior was related to attitudes, subjective norms, perceived behavioral control or intention to exercise. Pearson correlations revealed small positive relationships between pre-pregnancy exercise levels, and subjective norms, intention, and perceived behavioral control, and between current exercise levels and subjective norms and intention. Thus, higher levels of pre-pregnancy exercise and current exercise were associated with more positive subjective norms, higher perceived behavioral control, and higher intention to exercise.

These findings are consistent with other research examining the role of past behavior on TPB variables. In a paper dealing with two modeling techniques and three interpretations for the inclusion of past behavior into a TPB framework, Rhodes and Courneya (2003) noted that research has consistently found past behavior to be the single best predictor of future behavior. For example, Godin et al. (1989) examined which factors influenced pregnant women’s decision to exercise postpartum and found that ‘habit’ – a measure of how often the women had exercised over the past 12 months – was
significantly correlated with attitudes and intention. Similarly, in a study done to test the predictive ability of the TPB with several additional variables including past behavior, Bozionelos and Bennett (1999) found statistically significant correlations between past behavior and intention and past behavior and actual exercise behavior.

It is interesting to note, however, that the present study only revealed small (i.e., $r \leq .20$) relationships between past and current exercise behavior and TPB variables. One possible reason why the correlations were not larger may be the fact that, regardless of her past behavior, a woman may perceive having a baby as an important reason to make healthy lifestyle changes. This explanation is especially credible given the fact that the present sample reported very low levels of pre-pregnancy physical activity on the Godin Leisure Time Exercise Questionnaire ($M = 35.81; SD = 28.08$) and even lower levels of current exercise ($M = 20.83; SD = 18.89$). Given the women's current and past inactivity, it is possible that they may have perceived having a baby as an important reason to become more active, explaining why they scored low on the GLTEQ but high on the TPB variables.

5.5 Contribution of pre-pregnancy physical activity, attitudes, subjective norms and perceived behavioral control to the prediction of intention

Research question 3 sought to examine whether pre-pregnancy physical activity, attitudes, subjective norms, and perceived behavioral control predicted intention to exercise postpartum, as well as their relative importance to that prediction. Two hierarchical multiple regressions found that for low self-monitors, pre-pregnancy physical activity, attitudes, subjective norms, and perceived behavioral control all significantly predicted intention to exercise postpartum and accounted for 62% of the variance in
intention, whereas for high self-monitors, attitudes, subjective norms, and perceived behavioral control all significant predicted intention to exercise postpartum and accounted for 58% of the variance in intention. Consistent with other TPB research in the field of exercise, attitude was the strongest predictor of intention for low self-monitors, followed by perceived behavioral control, subjective norms and pre-pregnancy physical activity (for a meta-analysis, see Hausenblas et al., 1997). Further, these results are consistent with other research demonstrating that among low self-monitors, attitude tends to be the strongest predictor of intention (Hillhouse et al., 2000; Prislin & Kovrlija, 1992). It may be that, for low self-monitors who tend to control their behavior based on their own attitudes and internal cues (Snyder, 1974), their attitudes towards exercise are more influential than others' beliefs, their sense of control over exercise, or their past behavior, as they tend to be consistent in their behavior across situations.

For high self-monitors, perceived behavioral control and attitude were equally strong predictors of intention, and both were stronger than subjective norms, whereas pre-pregnancy physical activity was not a significant predictor. Given the fact that high self-monitors tend to be highly concerned with others' impressions of them (Synder, 1974), reporting high perceived behavioral control may have resulted out of a desire to appear strong and in control of one's life. Furthermore, pre-pregnancy physical activity may not have significantly predicted intention for high self-monitors given the fact that, compared to low self-monitors, these women may not display as much cross-situational consistency. Therefore, it only follows that their past behavior is not as strong a predictor of their future behavior as it would be for low self-monitors.
It should be noted that TPB scores also varied depending on previous experience with the postpartum period. For women pregnant with their first child, attitude was the strongest predictor of intention to exercise postpartum, followed by perceived behavioral control, and pre-pregnancy exercise levels, while for women pregnant with their second or subsequent child, only attitude, subjective norms, and perceived behavioral control significantly predicted intention to exercise, while pre-pregnancy physical activity was not a significant predictor. These findings are consistent with previous research demonstrating a woman’s past experiences with childbirth and the postpartum period may influence their attitudes, subjective norms, perceived behavioral control and intentions towards postpartum exercise (Godin et al., 1989).

These findings provide further support for the usefulness of the TPB in predicting exercise intentions in this population. Furthermore, the relative predictive utility of each variable is consistent with past research using pregnant populations. In a study examining TPB variables as they related to pregnant women’s intentions to exercise, Symons Downs and Hausenblas (2003) found attitude to be the strongest predictor of intention, followed by perceived behavioral control and subjective norms.

However, the present findings differ from Godin et al.’s work with respect to the order of importance of the variables. In order of decreasing importance, Godin et al. found the variables accounting significantly for the variance in intention to be perceived barriers, attitudes and habit, which, in the present study is consistent only with the findings for high self-monitors. It should be noted that Godin et al. measured perceived behavioral control very differently from the present study. After verbally warning women about several potential barriers to exercise that they may face (such as lack of social
support, or difficulty securing child care) subjects were asked a single question, “Following an evaluation of your personal situation, how strongly do you believe that to participate in one or more physical activities during your free time after giving birth will be easy or difficult for you?”

Consistent with past research on the usefulness of the TPB in the realm of exercise behavior (for meta analysis see Hausenblas et al., 1997), the present study found attitudes to be the strongest predictor of intention to exercise postpartum in low self-monitors. A person’s attitude towards a behavior is comprised of their behavioral beliefs: what they expect to achieve by performing the behavior (expected outcome); and outcome value, meaning how much they value the outcome of the behavior. Together, these two behavioral beliefs determine the individual’s positive or negative evaluation of those consequences. It may be that during pregnancy, positive outcomes for both mother and baby that are associated with exercise and placing a high value on these outcomes lead to especially positive attitudes in comparison to subjective norms and perceived behavioral control.

Also consistent with previous research, subjective norms accounted for the least variance in exercise intentions for both high and low self-monitors. According to Symons Downs and Hausenblas (2003), limitations of subjective norms in determining exercise intentions may be related to how this construct is operationalized and measured. For example, it is unclear whether people’s motivation is affected by their belief that important others want them to exercise, or by the presence of social support and praise that usually exists when others want them to exercise.
The present research found that attitudes, subjective norms and perceived behavioral control accounted for 58%-62% of the variation in intention. Similarly, in a study examining the factors influencing women’s decisions to exercise postpartum, Godin et al. (1989) found that attitudes, subjective norms and perceived behavioral control explained 55% of the variation in intention to exercise. It should be noted, however, that despite the predictive ability of the TPB variables, 39%-42% of the variance still remains unexplained. This may, perhaps be attributable to some of the TPB's main assumptions. For example, the theory assumes that human beings are rational and make systematic use of the information available to them (Ajzen, 1985, 1991). These assumptions fail to take into account the role that emotional responses, past experiences, or the unconscious may play in determining exercise behavior.

5.6 Limitations

While the present study is the first to examine the moderating role of self-monitoring on pregnant women’s intentions to exercise postpartum as well as the first to examine the effectiveness of two types of persuasive messages in this population using the TPB as a theoretical basis, there are several limitations that should be acknowledged.

Firstly, a social desirability bias, or the desire to portray oneself in a manner that will be perceived favourably by others, may be partially responsible for the relatively high scores on attitudes, subjective norms, perceived behavioral control, and intention. One factor that can influence how we are perceived by others is exercise status. For example, Martin, Sinden, and Fleming (2000) found that subjects reading short vignettes describing various individuals rated men and women who were described as exercisers more favourably on both physical and personality measures as compared to controls and
non-exercisers. Given the sample and the topic of the brochures, this social desirability bias may have been particularly salient, and women may have indicated higher intentions, more positive attitudes, subjective norms, and perceived behavioral control in order to portray an image of being an exerciser and consequently make a more favourable impression.

Furthermore, when it comes to self-reported health behavior, research supports the idea that social desirability bias may be even higher in pregnant samples as compared to the general population (Alvik et al., 2006; Ernhart et al., 1988; Ford et al., 1997; Parna et al., 2005). For example, many women know that alcohol consumption and smoking during pregnancy are not healthy, and several studies comparing self-report with more objective measures have shown that pregnant women tend to underestimate alcohol consumption (Alvik et al., 2006; Ernhart et al., 1988) as well as under-report smoking status (Ford et al., 1997; Parna et al., 2005). Given that our society values being physically active, it is possible that women reported higher intention to exercise postpartum and more positive attitudes, subjective norms and perceived behavioral control to appear more favorable to others, even though they may have been unlikely to follow through with the actual behavior.

Another limitation to the present study may have been a result of the uncontrolled environment in which the study measures were assessed. Several studies support the notion that higher levels of anonymity lead to reduced social desirability bias (Joinson, 1999; Sassenberg & Kreutz, 2002). In accordance with these findings, it is possible that the relatively low sense of anonymity fostered by the environment in which the data was collected may have resulted in a relatively high social desirability bias. Although
participants in the present study were verbally told that their answers were ‘anonymous,’ the waiting room was often crowded and women were sitting in close proximity to one another, making it possible for others to see one’s responses. In addition, participants personally handed in their completed questionnaire and consent form to the primary investigator, making it possible for their responses to be identified, albeit temporarily.

Thirdly, these results can only be generalized to white, middle class women who are pregnant and in the second or third trimester of their pregnancy. Data collection was restricted by difficulty in recruiting participants who were ethnically diverse, and the majority of participants were Caucasian, middle class, employed, and at least high school educated. For these reasons, caution must be exercised when generalizing the current findings to pregnant women who are single, unemployed, of low socioeconomic status, less educated, and ethnic minorities.

It is also important to note that the measures used were self-report and retrospective for physical activity behavior. While self-report instruments used to measure actual exercise behavior are acceptable, it is also desirable that researchers use objective measures (such as pedometers) to more accurately measure actual exercise behavior (Carron, Hausenblas, & Estabrooks, 2003). In addition, while the TPB items did specify frequency and duration of exercise, they failed to indicate exercise intensity or context. Describing the target behavior only in general terms as “exercising for at least 30 minutes, 3 or more times a week” lacked the specificity that Azjen (2007) recommends.

Finally, there was no measure of actual postpartum exercise behavior, therefore it is not possible to determine the existence of any long-term consequences to actual behavior. According to Fishbein and Ajzen (1975; Ajzen and Fishbein, 1980), the
predictive power of an intention varies inversely with the time between the measurement of the intention and the observation of the behavior. This is due to the fact that the longer the interval, the more likely it is that an intention will change. In the present study, women were asked to indicate their intention to exercise postpartum while they were still pregnant, and, since they ranged in weeks pregnant from 14 to 40, for those merely entering their second trimester the behavior in question was still 6 months in the future. Given the time lag between when intention was measured and when the actual behavior would occur, the predictive utility of reported intentions is unknown.

5.7 Future directions

Little research has examined the role of persuasive messages in motivating exercise behavior, and this is the first study of this kind to look at this important issue among pregnant women. Given the lack of difference that the present study found due to message type and self-monitoring status, more studies are needed to further our understanding of the role that persuasive messages and personality variables play in changing individuals’ exercise beliefs. Following are several recommendations that would enable future studies to build upon the current findings.

Because this study did not assess women’s intentions, attitudes, subjective norms and perceived behavioral control prior to reading the message, there is no way of knowing whether the brochure changed their beliefs towards exercise. In order to examine changes in beliefs, future studies should incorporate one or both of the following suggestions. Firstly, a pre-post design could be utilized, with two TPB questionnaires completed – one prior to reading the message, and the other one after in order to examine change in beliefs. Secondly, future studies should consider including a control group
which receives no message as well as an attention-control group (which would receive a message unrelated to exercise) in order to assess whether there is any difference between subjects who received a message and those who received no message or an attention-control message.

Secondly, self-monitoring is only one of many personality traits. As discussed earlier, it is possible that during pregnancy and motherhood, a woman's concern for her own and her baby's health supercedes her desire to make favourable impressions on others. For these reasons, further studies should examine the role that other self-presentational concerns play during this phase in a woman's life. In addition, further work needs to be conducted in order to examine the role that other traits – such as conscientiousness, openness, extraversion, agreeableness and neuroticism for example – play in moderating messages aimed at changing exercise behavior in pregnant women.

As noted, most of the women in the present study were married or had a partner, and were white, middle class, and had achieved the minimum of a high school education. Further studies should make an effort to include women who are ethnically diverse, in a lower income earning bracket, have less education and are single mothers. In particular, researchers should examine how these variables impact the TPB. Two possible areas of interest include the relationship between marital status and perceived behavioral control and between ethnicity and attitudes towards exercise. For example, single mothers may report lower levels of perceived behavioral control given their lack of spousal support and time constraints due to being solely responsible for childcare duties (Albright et al., 2006).
Although there is no way of knowing what the women's responses in the present study would have been had they not read either the health or appearance brochure, the relatively high and similar scores indicate that regardless of self-monitoring status, both health and appearance messages in the form of a brochure may be equally effective in influencing exercise beliefs. Therefore, any message promoting exercise in pregnant women may be effective, and future studies may want to examine whether brochures are indeed an effective way of promoting postpartum exercise to pregnant women.

In addition, future research should also examine whether other mediums could be more effective than brochures. As discussed earlier, two other studies using different media (DVD; short essay) to describe the benefits of exercise found significant differences between groups who received a message as compared to those who did not (Graham et al., 2006) and between those who received a health versus appearance-based message (Rhodes & Courneya, 2000). To examine whether another medium might reveal differences between appearance and health-based messages in this population, the present study could be replicated using a DVD or a short essay as the source of information about the benefits of exercise. Over brochures, DVDs have the advantage of being harder to skim through, and requiring more focused attention, while essays may create a more direct message.

Finally, given the relatively low contribution that subjective norms played in the prediction of intention, and the concerns that the present study as well as past studies (Symons Downs & Hausenblas, 2003) have expressed over the way in which subjective norms are operationalized, future studies may want to examine the validity of different ways of conceptualizing subjective norms in this particular population. Compared to
subjective norms, social and spousal support is likely to be even more important during the postpartum period, when a woman may feel that caring for a newborn leaves her with little time for herself. For example, Albright et al. (2006) investigated physical activity and related psychosocial factors in 79 new Hawaiian mothers of varying ethnic backgrounds. The authors surveyed their physical activity patterns before and after childbirth, and found a dramatic decrease in physical activity with 43% of women having been active before birth but inactive after. Barriers that the women cited were lack of support from a spouse and parenting duties, while facilitators included social support for exercise and the availability of childcare.

Possible changes include framing questions in such a way so that they more accurately assess a woman’s level of social support. That is, rather than asking whether significant others approve of a woman exercising after the birth of her baby, the question could be framed in such a way as to ask whether significant others are willing or able to support the woman in her attempts to exercise after the birth of her baby. This support could manifest in several ways, most simply by giving her a break and looking after her baby for a short period of time while she exercises. Therefore, perhaps questions that assessed the women’s anticipated level of social support would have resulted in a more accurate assessment of subjective norms.

5.8 Implications

5.8.1 Implications for practice. As compared to other educational mediums, brochures possess several distinct advantages; they are inexpensive, easy to reproduce and can convey information about a variety of topics, including health and exercise. Unlike books or videos, they can be perused while one is sitting and waiting for an
appointment, making them a particularly useful tool for disseminating information in doctor's offices. In addition, the low cost associated with producing printed pamphlets makes them ideal for mass production and dissemination on a large scale, and, unlike posters which are typically fixed to a wall, pamphlets can be taken home and reread at a later time. Although the amount of information that can be contained within a pamphlet is necessarily limited given the amount of space available, a reference panel listing further resources such as websites or useful books provides the keener reader with the opportunity to further investigate the topic at hand.

Given these distinct advantages, it is likely that they can be an effective way to educate a variety of populations, including pregnant women, about the benefits of exercise. Furthermore, given the results of this study, it may be possible that any message about the benefits of exercise (i.e., appearance or health benefits) is effective in changing women's beliefs about postpartum exercise. Thus, for convenience sake, it may be advantageous to design a brochure that covers all of the benefits of exercise in one document. The brochures could then be readily made available in such locations as doctor's offices, ultrasound clinics, day care centers, community centers and exercise facilities. In addition, given the relatively short time that physicians are able to afford each patient, brochures about the benefits of exercise could serve as a further source of information when handed out by a physician to his or her patient.

5.8.2 Implications for research. The present research points to the importance of conducting ecologically valid and theoretically sound studies which have practical real-world applications. As noted above, brochures are a practical method for disseminating information and one would be hard-pressed to find a doctor's office devoid of such
In addition, the brochures used for this study were professional-looking, colourful, and written at an appropriate literacy level given their target audience. They were comparable in scope and in amount of information contained to the other brochures that women would be likely to receive in such an environment. Regardless of whether written paragraphs or DVDs are more effective in a research environment, it is important to remember that they are also less practical to disseminate in a clinical setting and unlikely to be used except during the research study itself.

However, given that any message about the benefits of exercise may serve to change pregnant women’s beliefs regarding postpartum exercise, research examining the effectiveness of brochures should incorporate measures that can assess changes in beliefs in addition to follow up measures of actual behavior. In addition, message tailoring based on audience characteristics remains an important field of research, and even though this study did not find the personality trait of self-monitoring to influence message efficacy, further research is needed examining women’s individual personality and demographic factors and the effectiveness of messages about the benefits of exercise.

5.9 Conclusion

The present study found that self-monitoring did not moderate the effectiveness of health versus appearance messages on pregnant women’s intentions to exercise postpartum. However, all the women reported relatively positive attitudes, subjective norms, perceived behavioral control and high intentions to exercise postpartum, indicating that perhaps any message about the benefits of postpartum exercise is effective in changing women’s beliefs about exercise. Furthermore, the lack of effect due to self-monitoring may serve as an indication that at this stage in a woman’s life, concern about
her own and her baby's health may take precedence over self-presentational concerns.

Finally, brochures are an inexpensive and effective way to convey information about the benefits of exercise to this particular population and should be made available in strategic locations that pregnant women are likely to frequent.
REFERENCES


McCrory, M. A. (2000). The role of diet and exercise in postpartum weight management. *Nutrition Today, September, 01*


Appendix A: Ethics Clearance
DATE: June 6, 2007

FROM: Linda Rose-Krasnor, Chair
Research Ethics Board (REB)

TO: Kim Gammage, PEKN
Anca GASTON

FILE: 06-307 GASTON

TITLE: The Effectiveness of a Health vs Appearance-based message on Pregnant Women's Intentions to Exercise Postpartum

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: Accepted as clarified.

This project has received ethics clearance for the period of June 6, 2007 to August 15, 2008 subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The clearance period may be extended upon request. The study may now proceed.

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and cleared by the REB. During the course of research no deviations from, or changes to, the protocol, recruitment, or consent form may be initiated without prior written clearance from the REB. The Board must provide clearance for any modifications before they can be implemented. If you wish to modify your research project, please refer to http://www.brocku.ca/researchservices/forms to complete the appropriate form Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form Continuing Review/Final Report is required.

Please quote your REB file number on all future correspondence.

LRK/bb
Appendix B: Letter of Invitation
Letter of Invitation

You are invited to participate in a study that aims to determine whether brochures are an effective way to convey information about the benefits of postpartum exercise. My name is Anca Gaston, and I am a graduate student in Applied Health Sciences at Brock University working under the supervision of Dr. Kimberley Gammage. This study is being conducted for my Masters thesis.

You will be asked to fill out a demographics questionnaire, a questionnaire that assesses your past exercise behavior and a questionnaire assessing some personality variables. You will then read a brochure, and then fill out one more questionnaire. This will take approximately 10-15 minutes of your time.

You are invited to keep the brochure you read and look into the resources that are listed on the back panel.

All information will be kept strictly confidential and your name will not be included or associated with the data. You will not be identified individually in any way and all data will be destroyed after 5 years.

You may decline to answer any questions or withdraw at any time. However, once your questionnaire has been submitted you cannot withdraw because there is no way to know which questionnaire was yours.

If you would like a summary of the results, or would like to contact the researchers for any other reason, they can be reached at: anca.gaston@brocku.ca or kgammage@brocku.ca

This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (insert file #). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Sincerely,

Anca Gaston (anca.gaston@brocku.ca)
Dr. Kimberley Gammage (kgammage@brocku.ca)
Appendix C: Letter of Informed Consent
Letter of Informed Consent

Date: May 2007-August 2008
Project Title: Brochures as a source of information about exercise

Principal Investigator:
Anca Gaston, MA candidate
Department of Physical Education and Kinesiology
Brock University
anca.gaston@brocku.ca

Faculty Supervisor (if applicable):
Dr. Kim Gammage
Department of Physical Education and Kinesiology
Brock University
(905) 688-5550 Ext. 3772
kgammage@brocku.ca

INVITATION

You are invited to participate in a study that involves research. The purpose of this study is to determine whether brochures are an effective way to convey information about the benefits of postpartum exercise.

WHAT'S INVOLVED

As a participant, you will be asked to fill out a demographics questionnaire, a questionnaire that assesses your past exercise behavior and a questionnaire assessing some personality variables. You will then read a brochure about the benefits of exercise followed by one more questionnaire. Participation will take approximately 10 to 15 minutes of your time.

POTENTIAL BENEFITS AND RISKS

Since brochures are a very popular way of disseminating health information, possible benefits of participation include an improved understanding of what makes such brochures effective. This will help to design more effective informational materials in the future. In addition, the brochure which you will read includes a list of helpful resources regarding postpartum exercise. You are invited to keep this document for your future reference. There are no risks associated with participation in this study.

CONFIDENTIALITY

All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research.

Data collected during this study will be stored in a locked filing cabinet on campus. Data will be kept for 5 years after which time all records will be destroyed. Access to this data will be restricted to the primary investigator and faculty supervisor.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time. However, due to the fact that individual questionnaires have no identifying markers, once you hand in your forms it will no longer be possible to withdraw from the study.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available approximately 6 months after the completion of the study. If you wish to receive the results of the study, please provide an email address:

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Investigator or the Faculty Supervisor (where applicable) using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University.
University (REB #06-307). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

CONSENT FORM

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: 
Signature: __________________________ Date: __________________________

FUTURE CONTACT

If you would be willing to allow us to contact you in the future (after the birth of your baby) and send you an email questionnaire assessing your activity level at that time, please provide an email address: __________________________
Appendix D: Demographics Questionnaire
Demographics Questionnaire

Please answer the following questions to the best of your ability and as truthfully as possible.

1. What is your age: ______

2. How many weeks pregnant are you: ______

3. Is this your first pregnancy? ☐ Yes ☐ No
   If not, how many children do you have? ______

4. What is your ethnicity:
   ☐ Caucasian
   ☐ Asian/Asian American
   ☐ African/African American
   ☐ Native/Six Nations
   ☐ Hispanic/Hispanic American
   ☐ Other: ______________

5. Please indicate your approximate yearly household income:
   ☐ Under $25,000 ☐ $80,000-$100,000
   ☐ $25,000-$40,000 ☐ $100,000-$150,000
   ☐ $40,000-$60,000 ☐ Over $150,000
   ☐ $60,000-$80,000 ☐ Prefer not to answer

6. What is your marital status:
   ☐ Married/common law partner
   ☐ Single/divorced/separated

7. What is the highest level of education that you achieved:
   ☐ Graduate or Professional degree
   ☐ Bachelors
   ☐ College or technical training
   ☐ Secondary school diploma
   ☐ Some secondary school

8. What is your current employment status:
   ☐ Employed full time ☐ Employed part time
   ☐ Unemployed ☐ Student
Appendix E: Self-monitoring Measure
Self-monitoring Measure

Read the following questions carefully and please check off the appropriate box (True or False) for each of the following questions by placing a * in that box.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I find it hard to imitate the behavior of other people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. At parties and social gatherings, I do not attempt to do or say things that others will like</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I can only argue for ideas which I already believe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I can make impromptu speeches even on topics about which I have almost no information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I guess I put on a show to impress or entertain others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I would probably make a good actor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. In a group of people I am rarely the center of attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. In different situations and with different people, I often act like a very different person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I am not particularly good at making other people like me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. I'm not always the person I appear to be</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I would not change my opinions (or the way I do things) in order to please someone or win their favor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I have considered being an entertainer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I have never been good at games like charades or improvisational acting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. I have trouble changing my behavior to suit different people and different situations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. At a party I let others keep the jokes and stories going</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I feel a bit awkward in public and do not show up quite as well as I should</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I can look anyone in the eye and tell a lie with a straight face (if for a right end.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. I may deceive people by being friendly when I really dislike them</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F: Pre-pregnancy Exercise Behavior
BEFORE becoming Pregnant

EXERCISE QUESTIONNAIRE

1. Considering a 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free-time (write on each line the appropriate number)?

<table>
<thead>
<tr>
<th>Exercise Type</th>
<th>Times Per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) STRENUOUS EXERCISE</td>
<td></td>
</tr>
<tr>
<td>(HEART BEATS RAPIDLY)</td>
<td></td>
</tr>
<tr>
<td>(i.e. running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)</td>
<td></td>
</tr>
<tr>
<td>(b) MODERATE EXERCISE</td>
<td></td>
</tr>
<tr>
<td>(NOT EXHAUSTING)</td>
<td></td>
</tr>
<tr>
<td>(i.e. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)</td>
<td></td>
</tr>
<tr>
<td>(c) MILD EXERCISE</td>
<td></td>
</tr>
<tr>
<td>(MINIMAL EFFORT)</td>
<td></td>
</tr>
<tr>
<td>(i.e. yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)</td>
<td></td>
</tr>
</tbody>
</table>

2. Considering a 7-day period (a week), during your leisure-time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

1. OFTEN: _____  2. SOMETIMES: _____  3. NEVER/RARELY: _____
Appendix G: Current Exercise Behavior
CURRENTLY

EXERCISE QUESTIONNAIRE

3. Considering a 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free-time (write on each line the appropriate number)?

Times Per Week

(a) STRENUOUS EXERCISE
(HEART BEATS RAPIDLY)
(i.e. running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

(b) MODERATE EXERCISE
(NOT EXHAUSTING)
(i.e. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

(c) MILD EXERCISE
(MINIMAL EFFORT)
(i.e. yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

4. Considering a 7-day period (a week), during your leisure-time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

1. OFTEN: ___  2. SOMETIMES: ___  3. NEVER/RARELY: ___

Next Step: Read the Brochure
Appendix H: Health Brochure
Exercise Suggestions

The following sports and activities are considered moderate to vigorous and are sufficient for achieving benefits in most women:

- Cycling – a child trailer that attaches to your bicycle makes it easy to include baby!
- Jogging – think about investing in a jogging stroller and checking out our local trails!
- Swimming, fitness classes, aerobics, dance – many facilities provide child-care on site.
- Join a “mummy and me” fitness class where you will learn how to include your baby into your exercise routine.

Helpful Tip

Remember to warm up by stretching or walking for 5-10 minutes before you begin your workout and to take a few minutes at the end to cool down.

Remember to check with your doctor before beginning any exercise routine.

References


Women who don’t like to exercise just haven’t found their spot. There’s a physical activity that everyone can enjoy, even if it’s bowling or pushing a baby around the block in a stroller. When you find your passion, you’ll be a healthier, happier mom.

—Amelia Powe-Kline (Olympic Athlete and Mother)
Looking after Your Health

Having a baby and looking after a newborn is hard work. Taking care of yourself physically by making sure you exercise regularly, eat a good diet, and get plenty of sleep is important.

Even if you were not active before becoming pregnant, there is no better time to start! Exercising at a moderate to vigorous intensity 3 or more times a week and for at least 30 minutes at a time will increase your energy level and help you get back in shape.

For example, a study which looked at over 1000 new mothers found that those who engaged in vigorous exercise at least 3 times per week had retained significantly less weight, had better postpartum adaptation scores and were more likely to participate in fun activities such as hobbies and socializing (Samuels et al., 1996).

Exercise Benefits of Exercise

Exercising as soon as you are able after the birth of your baby will help you to:

- Increase aerobic fitness and strength
- Prevent heart disease, stroke and bone loss associated with breastfeeding
- Improve your mood and self-esteem and prevent postpartum depression
- Lower high blood pressure and improve cholesterol levels
- Boost your immune system
- Reduce the risk of several types of cancer
- Increase your energy level
- Improve your body composition

Getting Started

Even if you feel ready to start, it is an excellent way to get started, especially if you were not previously active. It is free, all you need is a pair of comfortable shoes, and you can take your baby with you!

Setting Goals

In order to take advantage of all of the health benefits of exercise, you should aim towards engaging in more vigorous exercise during which you are maintaining your target heart rate for at least 30 minutes at a time. Your target heart rate is between 80% and 90% of your maximum heart rate (220-age).
Appendix I: Appearance Brochure
Exercise Suggestions

The following sports and activities are considered moderate to vigorous and are sufficient for achieving benefits in most women:

- Cycling – a child trailer that attaches to your bicycle makes it easy to include baby!
- Jogging – think about investing in a jogging stroller and checking out our local trails!
- Swimming, fitness classes, aerobics, dance – many facilities provide childcare on site.
- Join a “mummy and me” fitness class where you will learn how to include your baby into your exercise routine.

Helpful Tip

Remember to warm up by stretching or walking for 5-10 minutes before you begin your workout and to take a few minutes at the end to cool down.

Remember to check with your doctor before beginning any exercise routine.

References


Women who don't like to exercise just haven't found their sport. There's a physical activity that everyone can enjoy, even if it's bowling or pushing a baby around the block in a stroller. When you find your passion, you'll be a healthier, happier mom.

—Alexandra Pater Apsel (Gymnics Affairs and Vision)
Looking after Your Body

Having a baby and looking after a newborn is hard work. Taking care of yourself physically by making sure you exercise regularly, eat a good diet and get plenty of sleep is important.

Even if you were not active before becoming pregnant, there is no better time to start! Exercising at a moderate to vigorous intensity 3 or more times a week and for at least 30 minutes at a time will help you lose the weight that you’ve gained and get back your pre-pregnancy body.

For example, a study which looked at over 1000 new mothers found that those who engaged in vigorous exercise at least 3 times per week had retained significantly less weight, had better postpartum adaptation scores and were more likely participate in fun activities such as hobbies and socializing (Sempersell et al., 1992).

Appearance Benefits of Exercise

Exercising as soon as you are able after the birth of your baby will help you to:

- Lose weight and return to your pre-pregnancy weight more quickly
- Build stronger muscles that look tighter and more toned
- Regain your pre-pregnancy body
- Burn fat and flatten your tummy
- Improve circulation leading to improved skin quality and a healthy glow
- Improve your mood and self-esteem and avoid the body image dissatisfaction that normally peaks in the postpartum period
- Feel and look more attractive
- Increase your energy level

Exercise An Program for You

Getting Started

Brisk walking as soon as you feel ready is an excellent way to get started, especially if you were not previously active. It is free, all you need is a pair of comfortable shoes and, you can take your baby with you!

Setting Goals

In order to burn fat and enjoy even more benefits of exercise, you should aim towards engaging in more vigorous exercise during which you are maintaining your target heart rate for at least 30 minutes at a time. Your target heart rate is between 60% and 80% of your maximum heart rate (220-age).
Appendix J: TPB Questionnaire
Questionnaire #2

The following questions ask you about your intentions to exercise after the birth of your baby. Please place a √ in the space that best indicates your answer. Please try to answer all the questions.

Ex: extremely unlikely: __________ √ __________: extremely likely

Intention

1. After the birth of my baby, I intend to exercise for at least 30 minutes, 3 or more times a week

   Definitely not: __________ __________: definitely

2. I will try to exercise for at least 30 minutes, 3 or more times a week following the birth of my baby

   extremely unlikely: __________ __________: extremely likely

3. I plan to exercise for at least 30 minutes, 3 or more times a week following the birth of my baby

   Definitely not: __________ __________: definitely

Attitude

For you, to exercise for at least 30 minutes, 3 or more times a week during your free time after giving birth would be...

interesting: __________ __________: dull
pleasant: __________ __________: unpleasant
stimulating: __________ __________: boring
healthy: __________ __________: unhealthy
good: __________ __________: bad
useful: __________ __________: useless
Subjective Norm

1. Most people who are important to me think that
   
   I should: _____________________________: I should not 
   exercise for at least 30 minutes, 3 or more times a week after the birth of my baby

2. It is expected of me that I exercise for at least 30 minutes, 3 or more times a week 
   after the birth of my baby

   extremely likely: _____________________________: extremely unlikely

3. The people in my life whose opinions I value would
   
   approve: _____________________________: disapprove 
   of my exercising for at least 30 minutes, 3 or more times a week after the birth of my baby

4. My partner would
   
   approve: _____________________________: disapprove 
   of my exercising for at least 30 minutes, 3 or more times a week after the birth of my baby

5. Most people who are important to me exercise for at least 30 minutes 3 or more 
   times a week

   Completely true: _____________________________: completely false

6. The people in my life whose opinions I value
   
   Exercise: _____________________________: do not exercise 
   For at least 30 minutes, 3 or more times a week

7. My partner
   
   Exercises: _____________________________: does not exercise 
   For at least 30 minutes, 3 or more times a week

8. Many women like me exercise for at least 30 minutes, 3 or more times a week 
   after the birth of their baby

   Extremely unlikely: _____________________________: extremely likely
PBC

For me to exercise for at least 30 minutes, 3 or more times a week after the birth of my baby would be

   Impossible: ___:____:____:____:____:____:possible

If I wanted to I could exercise for at least 30 minutes 3 or more times a week after the birth of my baby

   Definitely true: ____:____:____:____:____:____:definitely false

How much control do you believe you have over exercising for at least 30 minutes 3 or more times a week after the birth of your baby

   No control: ____:____:____:____:____:____:complete control

It is mostly up to me whether or not I exercise for at least 30 minutes 3 or more times a week after the birth of my baby

   Strongly agree: ____:____:____:____:____:____:strongly disagree

According to the brochure you read, what were two benefits of postpartum exercise?

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

______________________
Appendix K: Debriefing Form
Thank you for your participation!

Thank you for taking the time to participate today! You received one of two brochures about the benefits of postpartum exercise. One highlighted the appearance benefits while the other described the health benefits. The study aimed to assess whether one type of message is more effective in increasing women’s intentions to exercise postpartum.

Caring for a baby is a difficult and demanding job, and finding time to remain active can be particularly difficult during this period of life – especially if you have other children to look after! In addition, trying to overcome the barriers associated with exercise can be worrisome and stressful. For this reason, you are invited to keep the brochure you read and look into the resources that are listed on the back panel. Many of them provide suggestions on how to incorporate your baby into your exercise routine and help eliminate some of this stress!

In addition, please keep the Letter of Invitation in the case that you wish to contact the researchers or request a copy of the results!

Once again, thank you very much for your time.

Sincerely,

Anca Gaston, M.A. Candidate
Dr. Kim Gammage