

INTERVENTION EXERCISE PROGRAM TO CHANGE DECISIONAL BALANCE,  
DECREASE TEMPTATION NOT TO EXERCISE, AND  
INCREASE SELF-EFFICACY: FOR  
MOTHERS OF YOUNG  
CHILDREN

by

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A dissertation submitted to the faculty of  
The University of Utah  
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Exercise and Sport Science

The University of Utah

August 2015

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## ABSTRACT

This study aimed to further the understanding of physical activity participation for mothers of young children by exploring their decisional balance toward exercise, decreasing their temptation not to exercise, increasing their self-efficacy towards exercise, and increasing their intention to exercise. The two control groups included a traditional group, whose participants attended an aerobics class taught at a fitness club, and an individual group, whose participants exercised on their own. Participants in the power with-in (PWI) group followed a stage-targeted personalized intervention that combined constructs from the transtheoretical model (TTM) and theory of planned behavior model (TPB). The PWI group included a personalized exercise program, DVD, private website, life coaching, and instruction in order to promote change. Participants were mothers ( $N = 36$ ) aged 21 to 50 with young children between the ages of infancy and 17 years. All groups completed 6 weeks of exercise logs, eight pretest questionnaires, and seven posttest questionnaires. There was no significance indicated by a 2 x 2 ANOVA for all three groups ( $p \leq .05$ ). Other repeated measures yielded no significance. The collective pretests and posttests for all three groups over the 6-week intervention proved to have no significance in increasing decisional balance toward exercise, decreasing temptation not to exercise, and increasing self-efficacy towards exercise and intention to exercise. If the power were higher, the outcome of the study may have been more successful.

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## LIST OF ABBREVIATIONS

Individual group (IEG)

Power with-in group (PWI)

Theory of planned behavior model (TPB)

Traditional group (TEG)

Transtheoretical model (TTM)

## ACKNOWLEDGMENTS

It has been a long journey to finish this PhD, but a journey with many great giants to help guide and lead the way. I need to say thank you to Dr. John Poole and Dr. Barry Shultz who started this journey with me 20 years ago. I am very grateful to Dr. Marie Newton for her endless time and effort on my behalf. I could not have finished this dissertation without her help and collaboration. In addition, I would like to thank the other members of my doctoral committee, Dr. Lynne Durrant and Dr. Tim Brusseau, for their valuable assistance and constructive feedback. Among the great giants, there have been wonderful mentors who have been a great strength to me, including, Dr. Justine Reel, Dr. Nicole Detling, and Dr. Gibb Dyer, each of whom never gave up on me and my goal to complete this dissertation. I also wish to thank two of my research assistants, Megan Long and Charity Breneman. Both helped me enter data for my study. My deepest gratitude goes to Janell Ross and Katrina Oko-Odoi who helped me to keep a level head through constant revisions and edits of this final project; to Tammy Lambourne who helped me see the “trees through the forest” with statistics; to all my close friends, Mary Ellen Ross, Karie Smith, Tina Jessee, Adrienne Peterson, Sheryl Joice, Trish Weeks, and Michelle Bagnasco, who listened to me talk endlessly about my study, and challenged me to finish rather than giving me an out to give up. You are true friends. I could not have done this without you!

Lastly, thank you to my wonderful family. “Aim for the moon and grab some stars along the way!” Thank you for never giving up on me, and for standing by my side, for believing and trusting in me when others did not. Thank you for being wonderful children Alissa, Ryan, Jocelyn, and Adrienne! I could never have done this without your love and support during this entire process and journey. Lastly, to my very best and closest friend, my husband Mark. Thank you for trusting in me and believing in me. You have been beside me every step of the way, giving me support and words of encouragement. I love you.

A short speech from Winston Churchill that has always inspired me, “NEVER, NEVER, NEVER, GIVE UP!”

## CHAPTER I

### INTRODUCTION

Current research indicates that on average, women with dependent children participate in less physical activity than any other subpopulation group (Cramp & Brawley, 2006; Keller, Allan, & Tinkle, 2006; Marcus, Pinto, Simkin, Audrain, & Taylor, 1994; Verhoef & Love, 1994). A sedentary lifestyle such as theirs has been associated with several problems. These problems include, but are not limited to, lack of energy, depression, and increased anxiety (Nigg, Rossi, Norman, & Benisovich, 1998, 1999). Exercise is an important component of the lifestyle and wellbeing of every individual, and it is widely acknowledged to have a number of psychological and physical health benefits. Studies have shown that physical activity has mood-elevating effects (Berger & Owen, 1983, 1992, 1998) as well as the ability to reduce stress and anxiety (Brown et al., 1995; Jambor, Rudisill, Weekes, & Michaud, 1994; Wilson, Berger, & Bird, 1981). In addition, regular exercise has been shown to improve self-esteem and overall general health. A Surgeon General's report on physical activity and health in the United States (U.S. Department of Health and Human Services, 1996) stated that regular physical activity can prevent and treat conditions such as heart disease, type II diabetes, certain types of cancer, osteoarthritis, osteoporosis, and obesity. Moreover, in 2013, McGannon and Schinke stated that the factors of physical activity participation for

mothers of young children are only beginning to be understood.

Although regular exercise is clearly beneficial, there are still many who do not take advantage of the physical and physiological benefits of regular exercise. One of the greatest barriers to maintaining a regular exercise routine is change, namely life transitions, such as getting a new job, moving, becoming a parent, or retiring, just to name a few. Among these life transitions, motherhood is the most detrimental to regular physical activity. Although women in general have continually been shown to be less physically active than men (Nomaguchi & Bianchi, 2004; Scharff, Homan, Kreuter, & Brennan, 1999), several studies have shown that women who have children exercise less than women of a similar age who do not have children (Brown, Brown, Miller, & Hansen, 2001; Deem, 1982; Verhoef & Love, 1994; Woodward, Green, & Hebron, 1989). This makes women with dependent children the subpopulation group with the lowest levels of regular physical activity (Marcus et al., 1994; Nomaguchi & Bianchi, 2004; Verhoef & Love, 1994; Verhoef, Love, & Rose, 1992).

Researchers have shown that the number of women who engage in an amount of physical activity sufficient for health maintenance decreases substantially by the time they reach adulthood and are more likely to bear children, dropping by nearly 8%, and continuing to decrease significantly as they age (American Heart Association, 2013). This is even more disturbing when combined with the fact that mothers experience additional health risks after childbirth. These risks include increased anxiety and depression (Cox, 1986; Currie & Develin, 2002; Gotlib, Whiffen, Wallace, & Mount, 1991; Kendall-Tackett, 2001), as well as excess weight left over from pregnancy (South-Paul, Rajagopal, & Tenholder, 1992). Although a regular exercise routine would offer

mothers the physiological benefits of weight reduction and increased fitness as well as the psychological benefits of improved mood and vigor, few mothers make it a priority (Currie & Develin, 1999; Kolytn & Schultes, 1997).

One of the main reasons for this lack of regular exercise in mothers of young children—namely, those women with dependent children ranging in age from newborn to 17 years—are the constraints placed on their time by work and family circumstances (Brown et al., 2001). Naturally, mothers have different lifestyle factors and domestic situations, which leave them with less free time for active leisure than other social groups (Armstrong & Edwards, 2004; Brown et al., 2001). Furthermore, labor market trends indicate that mothers are joining their partners in the paid labor market in increasing numbers (Bittman & Wajcman, 1999). The result is that mothers of young children have a particularly difficult time gaining access to appropriate amounts of exercise due to the competing demands on their time. Furthermore many mothers of young children are further deterred from regular exercise by financial concerns and the lack of a discretionary income (Crawford, Jackson, & Godbey, 1991). These women also often experience a lack of social support from partners, family, and friends, which is a powerful disincentive to engage in physical activity (Pinto, Marcus, & Clark, 1996; Sallis, Hovell, & Hofstetter, 1992; Treiber et al., 1991).

Despite the unique situation and obvious health risks facing mothers of young children in regards to their lack of regular exercise, the body of literature investigating the problem is severely lacking (Armstrong & Edwards, 2004; Brown et al., 2001; Cramp & Brawley, 2006; Currie & Develin, 2002; Keller et al., 2006). Very few studies have examined patterns of physical activity and exercise in mothers (Dishman, Sallis, &



Orenstein, 1985; Keller et al., 2006; Marcus et al., 1994; Pinto et al., 1996). Healthcare professionals and researchers have developed exercise interventions based on theoretical models of behavior change in an attempt to increase physical activity levels in varying subpopulation groups (e.g., Marcus et al., 1992a); however, the specific effect of theoretical-based intervention programs on mothers of young children remains largely unexplored. For this reason, a theoretical-based evaluation of how mothers of young children's attitude towards exercise is affected by the competing demands on their time, their support networks, and financial concerns, is strongly warranted (Brown et al., 2001; Keller et al., 2006).

The motivation behind this study originated from a combination of professional and personal experience with the study population (mothers with young children). Through this researcher's work as a sports psychologist and personal trainer, it was apparent that traditional exercise regimens were not effective with women with dependent children. Moreover, the researcher's personal experience as a mother further informed her understanding and appreciation of the struggle that this population faces when attempting to establish and maintain a regular physical fitness routine. An in-depth examination of existing scholarship in the disciplines of sports psychology, behavioral science, and other adjacent fields yielded additional impetus for the current study due to the inadequacy of current literature. To that end, this research project strove to not only contribute additional research and valuable data to the limited amount of related scholarship, but also to develop an intervention that had the potential of successfully meeting the needs of the group being studied.

This study proposed to examine mothers' intention to exercise, as intention has

been shown to be the independent variable most likely to influence the overall amount of exercise engaged in by individuals. Courneya and Bobick (2000) discovered that a person's intention to perform a certain behavior is the central determinant of that behavior as it reflects the person's level of motivation and willingness to exert effort toward a specific end. In the case of mothers of young children, increased positive intentions toward exercise would naturally lead to more regular physical activity. A mother's intention can be tracked, measured, and improved as her attitudes and behaviors toward exercise are evaluated using theoretical models designed for that purpose (Courneya & Bobick, 2000; Girling-Butcher, Towers, Flett, & Seebeck, 2006).

After a thorough examination of the theoretical models available for a study of this nature, it was concluded that a mixed method intervention was warranted in order to yield the most robust results. For that reason, the transtheoretical model (TTM) was integrated with the theory of planned behavior (TPB) model, upon which the 6-week intervention designed by this researcher was based. TTM has evidenced important theoretical progress in the field, furthering researchers' understanding of when, how, and why people change their health behaviors (Prochaska & Velicer, 1997). TTM hypothesizes that health behavior change involves progress through six stages of change: *precontemplation, contemplation, preparation, action, maintenance, and termination*. Individuals pass through these six stages of change prior to adopting a new health behavior. TTM also identifies 10 processes of change, which along with decisional balance, self-efficacy, and temptation promote progress through the aforementioned six stages of change (Girling-Butcher et al., 2006; Keller et al., 2006; Prochaska & Velicer, 1997). Although this first model makes evident the process of change, TPB, in contrast,

studies the belief system behind people's intentions to change. In other words, TPB focuses on *why* people change, while TTM focuses on *how* people change exercise-related behavior. The TPB model looks specifically at the *behavioral beliefs*, *normative beliefs*, and *control beliefs* of individuals as they are related to exercise (Ajzen, 1991; Vallance, Murray, Johnson, & Elavsky, 2010). The summary proposition of this model is that people intend to perform a behavior when they evaluate it positively, believe others think they should perform it, and perceive it to be under their control (Ajzen, 1991).

Courneya and Bobick (2000) discovered that combining the constructs of these two theoretical models allowed for a more advanced understanding of behavior change, and promoted the construction of a more complex and representative model (see also Dombroski, 2006; Girling-Butcher et al., 2006). Courneya and Bobick hypothesized that the processes of change (TTM) would influence behavior change through the constructs of the TPB model. The scholars noted that integrating the two models and examining their different components enabled them to gain a better appreciation of individuals' intentions toward exercise (Courneya & Bobick, 2000). The current research project expanded upon Courneya and Bobick's idea of theoretical integration and attempted to apply the model to a new population—mothers with dependent children—and a new intervention, power with-in.

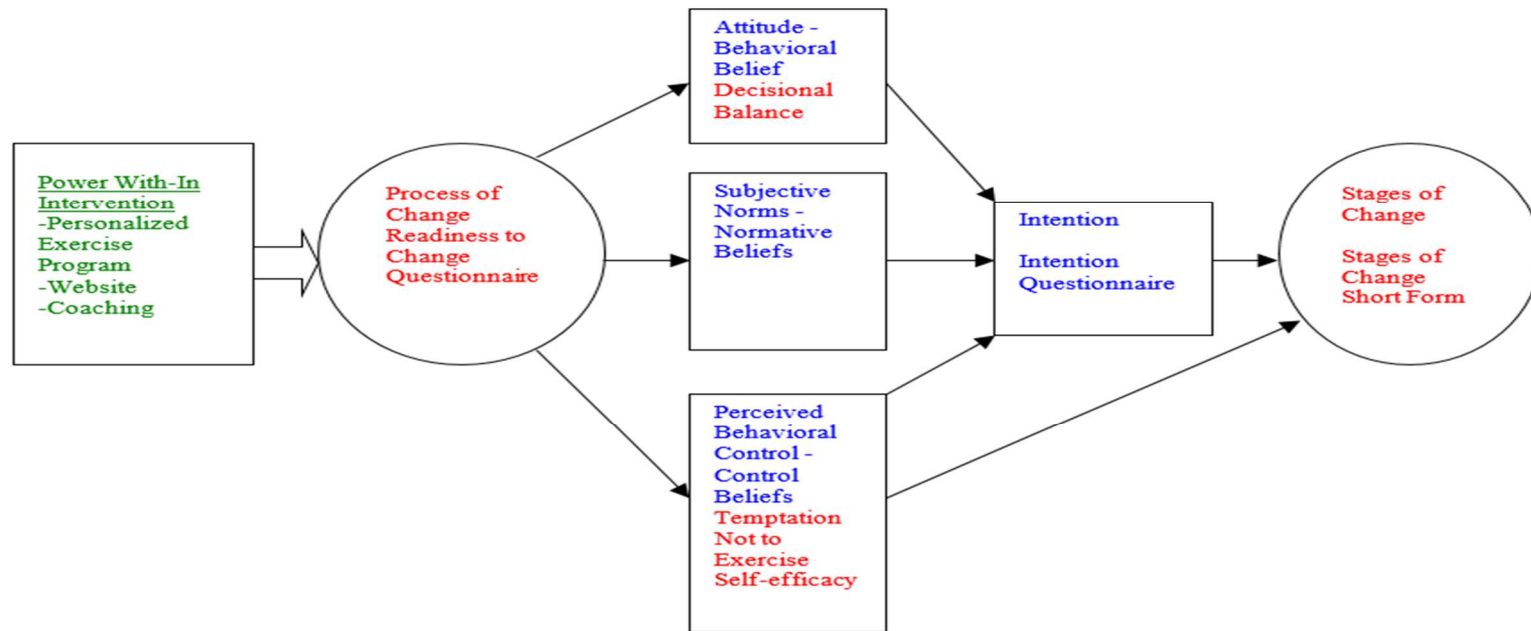
A study on physical activity and the stages of motivational readiness for change conducted by Marcus and Lewis (2003) found interventions to be more successful when tailored to the individual. The authors' research revealed important differences across individuals within each stage of change, making it imperative that the intervention be tailored to each person's specific needs. This is exactly what the PWI, as a stage-targeted

intervention, purported to do (see Figure 1). The PWI intervention included the use of a personalized DVD, access to a website, and life coaching instruction in order to promote change in constructs taken from both the TTM and TPB models.

The PWI intervention was designed to increase participants' intention to exercise in the following ways. First, a personalized DVD was created to activate *consciousness raising*, one of the 10 processes of change within the TTM model. As an educational intervention, the DVD was designed to increase awareness about the benefits of regular exercise. This initial step naturally activated participants' decisional balance, or their perceived pros and cons in regards to exercise, which is an integral part of the behavioral beliefs included in the TPB model. These behavioral beliefs consequently strengthened intention, which is a precursor to behavior change.

Second, participants' interaction with the PWI website established *helping relationships* by building increased rapport with the life coach. As another of the 10 processes of change (TTM), helping relationships promotes openness, acceptance, and support for healthy behavior change. Helping relationships also activates *subjective norms*, the TPB construct that examines the perceived social pressure that individuals feel to perform or abstain from a specific health behavior. Subjective norms further enhance intention strength.

Lastly, the life coaching included in the PWI intervention may activate the process of change activity of *self-liberation*. Also known as willpower, self-liberation is one of the 10 processes of change included in TTM and includes the belief that one can change, as well as the conviction to act upon that belief. Self-liberation in turn activates



RED: TTM  
 BLUE: TPB  
 GREEN: PWI

Figure 1. Diagram of the anticipated relationships among the processes of change (TTM), the theory of planned behavior (TPB), and the stages of change (TTM). Adapted from “Integrating the Theory of Planned Behavior (TPB) With the Processes and Stages of Change (TTM) in the Exercise Domain,” by K. S. Courneya and T. M. Bobick, 2000, *Psychology of Sport and Exercise*, 1, p. 44. Copyright 2000 by Elsevier Science Ltd.

the TPB construct of *perceived behavioral control*, which means the perceived ease or difficulty of exercising. This leads to the enhancement of intention.

In addition to intention, the PWI intervention affects three other important constructs that are shared by both the TTM and TPB models, which include, *decisional balance*, *temptation*, and *self-efficacy*. The first of these to come into play is decisional balance, which refers to the perceived advantages and disadvantages as well as the cost and benefits associated with changing a health behavior (Janis & Mann, 1977). As PWI participants are provided with new information in regards to physical activity, they will begin to weigh the pros and cons and make a decision about whether or not to exercise. This in turn affects temptation, which is a measure of the intensity of urges to engage in a specific action when in the midst of difficult situations (Grimley, Prochaska, Velicer, Blais, & DiClemente, 1994). Participants will be forced to decide to either give in to the temptation not to exercise or to go ahead and exercise even when they are not motivated to do so. This decision to exercise despite the temptation not to exercise will build self-efficacy, which is the confidence to overcome a high-risk circumstance without relapse into an unhealthy habit (Bandura, 1977, 1986, 1992). The end result of the increased intention, increased decisional balance, decreased temptation not to exercise, and increased self-efficacy brought about through the PWI intervention is that the participant will progress along the six stages of change discussed earlier in this chapter and move closer to adopting new health behaviors.

The PWI intervention is a 6-week intervention tailored to each individual participant. The intervention is designed to be adapted to participants' responses to questionnaires in regards to decisional balance, the processes of change, self-efficacy,

physical activity, temptation not to exercise, and readiness to change. For example, a participant's level of temptation not to exercise would directly affect the strategies included in their intervention program for increasing confidence. Also, any educational information included in the intervention was specifically tailored to the participant's existing beliefs and knowledge regarding physical activity. PWI is unique in that all three aspects of the intervention—the DVD, the website, and the life coaching component—are designed to be adaptable to the individual circumstances and background of each participant. Until now, few studies have examined the patterns of physical activity and exercise in mothers of young children, and none of them have included an intervention program modified to fit each mother.

### **Purpose of the Study**

The purpose of this study was to examine a model of exercise behavior change that integrated TPB and TTM. Combining the factors influencing exercise based on the available literature on health behavior change using TPB and TTM resulted in the design of an alternative intervention for this study, PWI. This new intervention was designed to increase exercise through a personalized exercise program. Furthermore, the current study examined how this new exercise intervention was purportedly more successful than traditional exercise methods in encouraging better attitudes towards exercise on the part of mothers, increasing their readiness to change towards exercise, and lowering levels of temptation towards not exercising.

### **Significance of the Study**

The present study was designed to expand upon previous research by evaluating the effects of a stage-targeted intervention on mothers' intentions toward exercise. Special attention was given to the change in each mother's behavioral beliefs, normative beliefs, and control beliefs, as well as her overall progress through the six stages of change. The significance of the current study is that if a positive relationship between the PWI intervention and increased intention to exercise in mothers of young children were to be illuminated, it would have tremendous implications for policy-makers and providers of leisure services as they create programs and support services better tailored to mothers' needs. Ultimately, such information could lead to increased intention and more regular physical activity among mothers in general.

### **Research Questions and Hypotheses**

This study was designed to investigate the following research questions:

1. What effect does the PWI intervention have on the intention to exercise?

**Hypothesis 1:** Mothers in the PWI intervention group will experience a greater increase in intention to exercise compared to mothers in the traditional group and individual group.

2. What effect does the PWI intervention have on cognitive processes of change and behavioral processes of change?

**Hypothesis 2a:** Mothers in the PWI intervention group will experience a greater increase in cognitive processes of change compared to mothers in the traditional group and individual group.



**Hypothesis 2b:** Mothers in the PWI intervention group will experience a greater increase in behavioral processes of change compared to mothers in the traditional group and individual group.

3. What effect does the PWI intervention have upon behavioral beliefs, normative beliefs, and control beliefs in decisional balance?

**Hypothesis 3a:** Mothers in the PWI intervention group will experience a greater increase in behavioral beliefs in decisional balance compared to mothers in the traditional group and individual group.

**Hypothesis 3b:** Mothers in the PWI intervention group will experience a greater increase in normative beliefs in decisional balance compared to mothers in the traditional group and individual group.

**Hypothesis 3c:** Mothers in the PWI intervention group will experience a greater increase in control beliefs in decisional balance compared to mothers in the traditional group and individual group.

4. What effect does the PWI intervention have on self-efficacy beliefs to exercise?

**Hypothesis 4:** Mothers in the PWI intervention group will experience a greater increase in self-efficacy beliefs to exercise compared to mothers in the traditional group and individual group.

5. What effect does the PWI intervention have on stage of change beliefs to exercise?

**Hypothesis 5:** Mothers in the PWI intervention group will experience a greater

increase in stage of change beliefs to exercise compared to mothers in the traditional group and individual group.

## CHAPTER II

### LITERATURE REVIEW

Many people today are aware of the positive correlation between pregnancy and a decline in physical fitness in women. There are countless books that take up the issue, as well as nutritionists, athletic trainers, and doctors who strive to assist new moms with maintaining a healthy lifestyle that includes regular exercise. Yet society is not as willing to recognize the long-term difficulties of finding time to stay fit and healthy while raising a newborn and running a family. The sedentary lifestyle of a typical mother only worsens with the growing number of childbirths a woman's body endures. The current study came about because of this researcher's awareness of the lack of existing research on this issue. While many sports psychologists study the physiological factors of weight gain and loss, the low levels of physical activity and sedentary lifestyle associated with many mothers have not been an area of interest for most of these analysts. Thus, as a mother and researcher who has observed this widespread issue amongst her immediate community of colleagues, acquaintances, and friends, the scarcity of valid data examining the particularities of the sedentary lifestyle and health problems of women with children demonstrated the urgent need for a more focused research study. The current research project was developed to address the aforementioned issues, focused specifically around the intention to exercise, temptation to not exercise, and self-efficacy issues related to the

physical activity of mothers with young children.

While issues with weight gain and difficulty finding time to exercise are topics of relevance to this study, the decision was made to focus on how to motivate women with children to exercise. The reason for this approach was to better understand the aforementioned factors affecting exercise for this specific population and to design an alternative behavior intervention with the potential to successfully address those issues and effectively respond to the needs of sedentary women with children. The design and implementation of a single intervention in this study will aid the researcher and other scholars in the field in better understanding what type of clinical approach is most effective for the target population. Will a personalized exercise program with the input of the participant be sufficient to motivate these women to remain committed to a 6-week exercise program? In order to situate the current study within the larger context of behavioral intervention studies and analysts' current understanding of the circumstances surrounding the sedentary lifestyle of women with children and the barriers to self-efficacy, relevant scholarship will be explored in the sections that follow.

The review of literature in this chapter will begin with a macro focus, narrowing to a micro focus. To this end, our discussion will begin with a general overview of the current scholarship related to adults and exercise, taking into account both the male and female gender. An exploration of the documented factors that are known to influence exercise based on current research in the field of sports psychology will follow. This will lead into a brief consideration of the importance of the research area chosen for the current study, justifying the decision to focus specifically on the population of women with young children as the target group.

The next four sections will focus on the theoretical grounding of this study, beginning with a discussion of the theoretical approach to change in broad terms, followed by an examination of TTM and TPB—the two main models on which the methodology for the current study is based. The researcher will then consider the advantages and drawbacks of integrating the TTM and TPB models, and justify the decision to use the integration model for the purposes of this study. The focus of the chapter will then transition into an explanation of the researcher’s decision to employ an intervention for the current study, prior to exploring the initial hypotheses in the explanatory section, which are based on the chosen models. The results will then be briefly explored in the predictive section.

### **General Discussion of Adults and Exercise**

Compared to the relatively scarce amount of literature available addressing the population of study, there is a vast amount of existing scholarship on the relationship of adults toward exercise. Obtaining sufficient physical activity to maintain one’s health has long been a struggle in a society whose lifestyle has become increasingly sedentary. With new technologies emerging every day to meet our every need and avoid unnecessary movement or physical exertion, adults today must make a conscious effort to stay fit and maintain healthy habits, including regular exercise (King & Kiernan, 1997; Nomaguchi & Bianchi, 2004; Robinson & Godbey, 1997). Grzywacz and Marks (2001) stated, “National estimates indicate that 30 percent of American adults remain completely sedentary, and only 14-23 percent of adults engage in enough physical activity to achieve health-related benefits” (p. 202). Understanding the specific barriers to exercise faced by

adults is thus a necessary first step to reversing this trend of sedentary living that is so prevalent in our society today.

In general, studies examining the different barriers to exercise for both men and women have found that time availability is one of the main deterrents. Nomaguchi and Bianchi (2004) indicated that married adults spend less time exercising than unmarried adults, while married adults with children spent even less time exercising, with those parents of children under age 5 facing the greatest barrier to exercise. Extended work hours also led to less time exercising, although family roles had the most significant effect on exercise frequency and duration among adults (Nomaguchi & Bianchi, 2004). The authors reported, “Being a good spouse, parent, and employee are so important for American adults that many adults spend much time in these roles and face difficulty in finding time for their leisure and relaxation, including time for fitness and exercise” (Nomaguchi & Bianchi, 2004, p. 414). Thus, cultural factors are also potential barriers to exercise.

Another significant factor related to levels of physical activity is socioeconomic background. In a 2003 study, Parks, Housemann, and Brownson found, “Lower income residents were less likely than higher income residents to meet physical activity recommendations” (p. 29). In a similar study, Grzywacz and Marks (2001) found that adults’ physical activity level was directly related to the safety of their neighborhoods, as well as their education and income levels—factors which are oftentimes interrelated and mutually dependent. The authors noted, “Less participation in vigorous exercise among blacks, in contrast to nonblacks, was explained by their tendency to live in less safe neighborhoods and having more functional health problems” (Grzywacz & Marks, 2001,

p. 202). Furthermore, location of residence in an urban or rural environment also significantly affects the frequency of exercise among adults, with those residing in rural areas significantly less likely to exercise regularly (Parks et al., 2003; Vojnovic, 2006).

A related issue to location of residence in determining levels of physical activity is the work environment of individuals as well as the building design of an individual's workplace and place of residence. While adults whose jobs require them to be sedentary throughout the work day are more likely to be less physically active, a 2009 study by Nicoll and Zimring found that those individuals who made exercise a priority would find ways to fit physical activity into the workday, namely through taking the stairs rather than riding the elevator.

The difference in physical fitness levels between genders is substantial, as many studies in recent decades have demonstrated (Bianchi, Milkie, Sayer, & Robinson, 2000; Hochschild, 1989, among others). Nomaguchi and Bianchi (2004) documented that while women participate in physical activities at about the same frequency as men, women do not engage in the same level of rigorous exercise as do men. One of the principle factors explaining why "women are disadvantaged relative to men in active, intensive, individual leisure time" is the fact that women are more likely to combine their perceived free time with "other activities, especially with housework and child care, and [their exercise] is more likely to be interrupted and less intensive" (Nomaguchi & Bianchi, 2004, p. 417). Henderson and Bialeschki (1991), among others, acknowledged the differences in gender expectations regarding family and work roles as a potential barrier to exercise for women. The authors indicated that women are likely to feel guilty about spending their free time on exercise due to the cultural value of care and

responsibility associated with the female gender in American society (Henderson & Bialeschki, 1991; Nomaguchi & Bianchi, 2004). Regardless of the differences in exercise rates between men and women, there is a clear difference in physical activity levels within the female population itself. This difference is directly related to whether women are single or married, and whether they have children or not. Physical activity levels among the female population will be discussed in more detail in a later section.

### **Factors Influencing Exercise**

Many factors influence decisions to engage in exercise. The theories and attendant methodologies pertaining to *attitudes*, *temptations*, and *readiness to change* are the main influential factors that scholars have identified pertaining to adults' decision to exercise (Hausenblas et al., 2001; Marcus et al., 1992a; Norman, Benisovich, Nigg, & Rossi, 1998). An individual's attitudes regarding exercise encompass their intentions, or motivations, to exercise. In the context of the current study, *intention* is defined as the direction of an individual's efforts and actions in pursuit of a specific result. An intention to exercise, for example, could be to maintain one's health or to improve one's physical appearance. Temptations, on the other hand, refer to the desire to do or have something that one knows he or she should avoid. Thus, in the context of the current study, the temptation to lie around on the couch watching television instead of exercising is a potential barrier to an individual's physical activity levels. Finally, readiness to change can be associated with self-efficacy, or a person's belief in their ability to achieve a certain goal or objective. Self-efficacy is related to self-confidence, and is a key factor in an individual's commitment to regular exercise; one must first believe in their ability to



change their routine before they will be able to make that change.

Aside from the main factors of intention or attitude, temptation, and readiness to change (self-efficacy), which were the principle variables examined as part of this study, other phenomena are also potential barriers to regular exercise. These include the factors mentioned in the previous section, including lack of time due to work schedule, family and role obligations, location of residence, and socioeconomic background (Grzywacz & Marks, 2001; Nomaguchi & Bianchi, 2004; Parks et al., 2003; Vojnovic, 2006). These factors play into psychological determinations related to intention and self-efficacy. If a mother feels that her role is to stay home and care for her children, it is likely that this belief will influence her intention to exercise as well as her readiness to change (Grzywacz & Marks, 2001).

In a 1999 study on the relationship between planning and implementation, Gollwitzer found that individuals encounter problems in transforming goals into action. This difficulty results from a range of factors, including the failure to get started, the possibility of becoming distracted, and the risk of falling back into old habits. Gollwitzer's (1999) research explains that while a behavior is still in the development stage, a strategy known as *automatic processes* is evolving. This automatic process is a methodical plan set in place in an attempt to ensure that the desired goal, or *desired behavioral change*, is achieved. This process includes coping techniques to avoid any distractions or barriers to achieving said goal. For example, an individual could set in place the rule that whenever bad weather is present, the alternate, inside exercise program must be pursued. With practice this becomes an *automatic response* so that the desired behavior goal is unchanged because a substitute action is put in place to accomplish the

desired behavior goal (Gollwitzer, 1999). In this case, bad weather was the temptation to not exercise, but when properly substituted with an automatic response, the goal to exercise regularly stayed on track.

Ultimately, Gollwitzer (1999) realized that the underlying processes in the attainment of goals are by way of intention. His research demonstrates that the implementation of intentions by an individual furthers the attainment of goals, and reveals the underlying automatic processes that evolve along the way. With a similar focus on intention, the current study found that the most successful model in addressing this multitude of factors affecting exercise was the integration and analysis of these factors through the application of the combined TTM and TPB models. As Courneya and Bobick (2000) have demonstrated, this combined model intervention approach has the potential to increase the amount of time spent exercising by participants.

### **Background on Topic of Study: Why Focus on Women with Young Children?**

The current study arose from this researcher's interest in better understanding the prevalence of reduced exercise and sedentary lifestyle among women with young children. Beyond simply understanding this phenomenon, this study seeks to identify alternative types of programs or interventions that can successfully address these concerns in the target population. The first question to answer is why mothers with young children exercise less than other population types. There is a relatively strong consensus within the current (albeit limited) scholarship addressing this issue. Many analysts have concluded that mothers face frequent—if not constant—distractions and

barriers to exercise (Armstrong & Edwards, 2004; Brown et al., 2001; Cramp & Brawley, 2006; Currie & Develin, 2002; Keller et al., 2006; Scully, Kremer, Meade, Graham, & Dudgeon, 1998). These barriers thus prevent mothers with young children from obtaining the health benefits of exercise that many other members of the adult population are enjoying. In a 2001 study, 85 to 88% of women admitted that they were more active before they had children than after (Brown et al., 2001). This lack of exercise opportunities is attributed by many scholars to the sociocultural circumstances within which a mother is situated (Brown et al., 2001). The results show that the majority of women felt they lacked the time for physical activity due to their obligations to children, home, and partner (Armstrong & Edwards, 2004; Brown et al., 2001).

As mentioned previously, there is a gap in the existing literature on the topic of mothers who have young children and their relationship to exercise. One of the principal reasons for the lack of studies focusing on this population is due to their unreliability as research subjects. This researcher has found that mothers with children are a particularly difficult population with whom to work because their multiple obligations often intervene with their exercise plan. Thus, mothers can be a particularly frustrating group with whom to work when it comes to exercise. Furthermore, Tavares, Plotnikoff, and Loucaides (2009) pointed out that historically, women in general have been under researched in studies of physical activity and disease. The general public often perceives the relationship of all women to exercise—with or without children—as homogenous, concluding that every female faces similar barriers to exercise regardless of their chosen lifestyle and responsibilities. A study comparing mothers with children and women without children, however, determined that mothers with children have many more

barriers to exercise than do women without children. This is the principle dividing factor between mothers with children and women without children when it comes to exercise (Brown et al., 2001; Verhoef & Love, 1994). A study by Brown et al. (2001) indicated that women with young children are far less likely to exercise than their childless counterparts, concluding:

The fact that mothers have no time for active leisure due to commitments to young children and housework is indicative of a situation whereby the *practical* demands of childcare and the *ideologies* associated with motherhood are powerful influences on the way women prioritize their use of time. (p. 140)

Thus, it is apparent that the added pressure of the social and cultural expectations that come with motherhood is a significant barrier to exercise for this population, and this is perhaps the crucial difference between women without children and mothers with children.

Research focusing on mothers from diverse socioeconomic backgrounds and ethnicities is also an important consideration for the current study. Research conducted by Keller et al. (2006) indicated that social interaction and the sharing of knowledge within a community of new mothers is extremely beneficial, especially among ethnic populations with a higher risk of obesity and diabetes. While the scholars' study focused primarily on Mexican American women, it concluded that within ethnic communities, more information about the serious health hazards of a sedentary lifestyle could encourage increased levels of physical activity in postpartum women (Keller et al., 2006). Like Currie and Develin (2002), as well as earlier studies including Scully et al. (1998), A study by Keller et al. (2006) also stressed the lack of sufficient data in this subject area, concluding, "it would be beneficial for future research to focus on evidence highlighting the link between postnatal exercise and psychological well-being" (Keller et al., 2006, p.

892).

Although there is certainly a need for further research in this area, several studies have discovered positive correlations between increased exercise and decreased symptoms of depression and anxiety in postpartum women. The increased prevalence of anxiety and depression after childbirth is already well-documented—thus the emergence of the term *postpartum depression* (Cox, 1986; Gotlib et al., 1991; Kendall-Tackett, 2001). Another disadvantageous consequence of childbirth on women is increased weight gain postpartum, which some analysts argue further contributes to decreasing frequency of exercise among mothers with young children (South-Paul et al., 1992). Nevertheless, when pursued consistently, exercise has been shown to be very beneficial to women after childbirth. Some scholars, including Currie and Develin (2002), even recommended exercise as a preventive action for the risk of postnatal stress and depression among new mothers.

A recent study of mothers suffering from postnatal disorder (PND) found that “a 12-week, pram [or stroller]-walking intervention has the potential to improve both fitness levels and depressive symptoms for women who reported experiencing PND. The intervention demonstrated that the exercise made a clinical difference to depressive symptomatology” (Armstrong & Edwards, 2004, p. 187). Earlier research, such as a study conducted by Sampelle, Seng, Yeo, Killion, and Oakley (1999), also supports using exercise or some form of physical activity as a strategy to influence mood state. The analysts’ 1999 study demonstrated that exercise is indeed capable of generating psychological benefits and positively influencing the mood state of an individual (Sampelle et al., 1999). As mood states increase to a positive level, many of the

participants found that anxiety and depression, in turn, decreased, and also experienced increased levels of energy (Koltyn & Schultes, 1997).

The findings of Armstrong and Edwards (2004) corroborate the more general data on the correlation between mood state and exercise documented several years earlier by Koltyn and Schultes (1997) and Sampsel et al. (1999), among others. Armstrong and Edwards (2004) identified a direct relationship between regular exercise (two times per week) among postnatal mothers and the decrease in reported feelings of depression. While it is clear that the relationship between increased exercise and improved mental health is not new, the scholars' emphasis on establishing a sense of community among the mothers is of particular relevance to the current study's target population. The conclusions drawn by Armstrong and Edwards (2004) regarding the sense of community and social support provided by mother's exercise groups relate directly to the principle objectives of this researcher's study. These findings specifically demonstrate that personalized, behavior-based intervention among this focused population of mothers with young children is key to ensuring the women's long-term commitment to their exercise routine (Armstrong & Edwards, 2004). The work of Cramp and Brawley (2006) furthers this assertion by stating, "a group-mediated cognitive behavioral approach to promoting physical activity initiation among sedentary post natal women produces more favorable effects than standard exercise training alone" (Cramp & Brawley, 2006, p. 8). The 6-week exercise intervention designed by this researcher for the current study is just such an approach.

Several current studies including Armstrong and Edwards (2004), Brown et al. (2001), and Currie and Develin (2002), to name a few, clearly call for further

investigation into the potential of alternative exercise programs' successful intervention with this population. Currie and Develin's (2002) conclusions, in particular, indicated the need for more attention to be directed towards nonpharmacological (i.e., behavioral) studies of postpartum depression. Furthermore, the analysts stated, "it would be beneficial for future research to focus on evidence highlighting the link between postnatal exercise and psychological well-being" (Currie & Develin, 2002, p. 892). As such, one of the main objectives of the current study was to generate additional data that would corroborate this link in order to further illustrate the health benefits of exercise among the population of women with young children.

### **Theoretical Approach to Change**

Many scholars, including Gielen and Sleet (2003), have noted "the need to improve behavioral interventions by using better empirical data about determinants of behavior as well as theories and frameworks pertaining to change in health behavior" (p. 65). The use of behavioral science approaches to more effectively understand and address issues related to the health behavior of individuals has grown in popularity among analysts in recent decades (Rhodes, Blanchard, & Matheson, 2006; Tavares et al., 2009; Thompson, Sleet, & Sacks, 2002). One of the earliest explorations into this type of behavioral approach was conducted by Fishbein and Ajzen (1975), examining the relationship between attitude, belief, intention, and behavior. The authors stated, "a specific behavior is viewed as determined by the person's intention to perform that behavior," asserting in turn that "a person's intentions... are a function of certain beliefs" (Fishbein & Ajzen, 1975, p. 16). In regards to effective methods to bring about changes

in behavior, Fishbein and Ajzen claimed, “changing beliefs can produce changes in other beliefs as well as changes in attitudes... changes in attitude toward a behavior or in subjective norms can lead to changes in intentions, and... changes in intentions can produce behavioral change” (1975, p. 512). Perhaps the most important conclusion drawn by the 1975 study was the fact that “intentions serve as the primary determinants of overt behavior” (Fishbein & Ajzen, p. 511).

Scholars followed in the footsteps of Fishbein and Ajzen by examining the relationship between intention and behavior more closely. Many existing studies have focused on how an individual’s intentions can be influenced in order to induce change in a certain behavior. In another groundbreaking study, Albert Bandura presented an integrative theoretical framework related to behavioral change achieved through different types of psychological treatment (1977). Among other things, Bandura (1977) postulated, “cognitive processes mediate change but... cognitive events are induced and altered most readily by experience of mastery arising from effective performance” (p. 191). It is therefore the *performance* of a repeated action—a new behavior, for example—that conditions the mind to concrete behavioral change. Recent research continues to coincide with Bandura’s foundational 1977 theoretical framework. In a 2009 study examining the effects of financial incentives to exercise on individuals with a sedentary lifestyle, Charness and Gneezy found that by getting participants to begin going to the gym regularly through monetary incentives, the routine conditioned their mind to behavioral change. The large minority of participants continued going to the gym after the conclusion of the incentive program (Charness & Gneezy, 2009). The authors asserted, “Habits increase the marginal utility of engaging in an activity in the



future. People seem to systematically underestimate the impact of their current actions on the utility of future action and to discount the future too much” (Charness & Gneezy, 2009, p. 927).

Moreover, in his discussion of psychological treatment of mental disorders, Bandura clarified the difference between *self-efficacy*—an individual’s belief in their ability to execute a certain behavior—from *outcome expectancy*—an individual’s conviction that a certain behavior will lead to a specific outcome (1977, p. 193). Similar to Fishbein and Ajzen (1975), Bandura (1977) concluded that self-efficacy—related to the factor of *intention*—has the most direct influence on behavioral change. Bandura’s theory of behavioral change was the precursor to the well-known TTM today. As previously mentioned, TTM was one of the two models chosen to implement in the current study. The early work of scholars such as Fishbein, Jansson, and Bandura paved the way for the study of different stages of change, which is associated today with TTM. A 2003 study focused on physical activity and the stages of motivational readiness for change conducted by Marcus and Lewis found interventions to be more successful when tailored to the individual. Their research showed important differences across individuals within each stage of change, making it imperative that the intervention be tailored to each person’s specific needs. This specification was taken into account when designing the current PWI intervention, which is a personalized, stage-targeted intervention.

For a study focused on behavioral change such as the current research project, there are many potential approaches to data collection and analysis. Some of these methods include theoretical-based approaches, behavioral-based models, and mixed method studies. For this research project, two models were used, TTM and TPB. Both

the TTM and TPB models are incredibly versatile, and have been applied to studies across a wide range of disciplines. TTM, in particular, has been used for treatment of addiction, severe mental illness, and heart disease, and has also been applied to address issues of condom use in HIV-positive youth, breastfeeding, and clinical social work practice, to mention a few subject areas (Gielen & Sleet, 2003; Keller et al., 2006; Prochaska, DiClemente, & Norcross, 1992). TPB has also been used in a diverse range of studies across different fields, including behavioral treatments of individuals suffering from a phobia, obsessive-compulsive disorder, or adolescent psychopathology, as well as in relation to ethical decision making, oral health, and sexual education (Gielen & Sleet, 2003; Vallance, Murray, Johnson, & Elavsky, 2010; Warshaw, 1980). Prior to elucidating the specific application of these models in the current study, a more general discussion of each model is warranted.

### **Description of Transtheoretical Model (TTM)**

For the purpose of this study, the first model utilized was TTM, a groundbreaking theoretical framework that helped analysts understand when, how, and why people change their health behaviors (Bandura, 1977; Prochaska & Velicer, 1997). The TTM model hypothesizes that health behavior change involves progress through six stages of change: precontemplation, contemplation, preparation, action, maintenance, and termination. Individuals pass through these six stages of change prior to adopting a new health behavior. The TTM model also includes ten processes of change, which along with decisional balance, self-efficacy, and temptation, promote progress through the aforementioned six stages of change (Girling-Butcher et al., 2006; Marcus et al., 1994;

Prochaska & Velicer, 1997).

As stated above, there are six stages of change; precontemplation (not seriously considering a change), contemplation (seriously considering a change), preparation (making small changes), action (making changes to an appropriate level), maintenance (sustaining the change over time), and termination (eliminating the risk of relapse). The maintenance and termination stages were not relevant for the current study, although they have been used for other research interventions (Courneya & Bobick, 2000; Girling-Butcher et al., 2006). Of most interest in the current study were the early stages through the action stage. When individuals seriously consider changing their behavior within the next month, they are in the preparation stage. The action stage, in turn, is characterized by overt, measurable changes in behavior that have consistently occurred during the past six months.

Due to the fact that the focus of the current study was on intention to exercise, the temptation not to exercise, and self-efficacy issues regarding exercise, the participant pool for this research was limited to mothers who were in the first four stages of change; precontemplation, contemplation, preparation, and action. Consequently, any participants maintaining a regular exercise program for more than 6 months were not considered in the study.

### **Description of the Theory of Planned Behavior Model (TPB)**

The TPB model studies the belief system (behavioral beliefs, normative beliefs, and control beliefs) related to exercise (Ajzen, 1991; Gielen & Sleet, 2003; Vallance et al., 2010). Behavioral beliefs refer to the advantages and disadvantages to exercise and

are assisted by decisional balance, both of which are also found in TTM. The research tool used to determine one's behavioral beliefs is the Decisional Balance Questionnaire (Marcus et al., 1992a), which focuses on decision-making processes related to behavior change, and the costs and benefits of health behavior change (Janis & Mann, 1977) in exercise. A normative belief in TPB evaluates individual beliefs and group beliefs and measures their importance. Control beliefs are then defined as how behavior is perceived when an individual is performing exercise. Such behavior would be characterized as exercising with *ease* or with *difficulty*, for example. The person's control beliefs are measured by the opportunities and resources available to promote or allow for exercise. Much information in TPB studies is found by studying the amount of time and effort a participant sets aside for exercising each week and their ability to perform the exercise.

The desire for change in an individual comes from control beliefs and are determined by attitudes, subjective norms, and perceived behavioral control (PBC) within the individual. PBC is seen as the ease or difficulty of performing the behavior that a person perceives prior to completing the behavior. Attitudes, in turn, consolidate individual beliefs and social influences and are an important characteristic of exercise behavior (Chogahara, Cousins, & Wankel, 1998). Attitudes have an underlying structure in social psychology, along with a strong determinant of the behavior to exercise, and thus reflect another common element shared by TTM and TPB models (Ajzen, 1991; Godin & Kok, 1996).

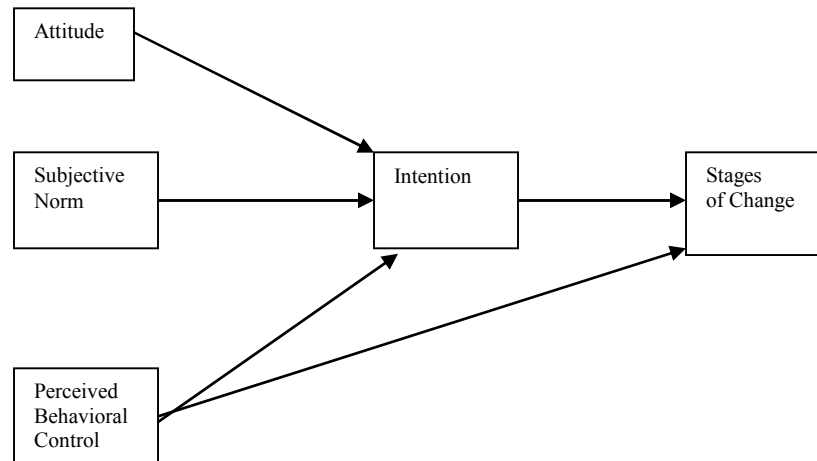
Just as in TTM, intention is a principle factor within the TPB model as well. An individual's level of commitment to perform the required behavior is directly related to intention. The intention factor was identified as the determining factor in a person's

follow-through with behavior change. When a person stops exercising and then decides to start up again, for example, this type of behavior is considered to be intention by researchers Courneya and Bobick (2000), among others (Chogahara et al., 1998; Vallance et al., 2010). Intention has been found to be a key component in both TPB *and* TTM that influences behavior change and simulates the desire to perform the exercise.

### **Integrating TTM and TPB Models**

The integrated model combining elements of TTM and TPB (see Figure 2) played a central role in the developmental process of the intervention for this research project, and was imperative to understanding how mothers of young children would benefit from exercise. A limited group of scholars, including Courneya and Bobick (2000), Dombroski (2006), and Girling-Butcher et al. (2006), has found that specifying relationships among the constructs of these two theoretical models facilitates a more sophisticated understanding of behavior change and promotes the development of a more parsimonious model. Courneya and Bobick (2000) in particular discovered that by combining the two models and studying their individual differences, they were able to gain a better understanding of individuals' intentions toward exercise. As such, the current research project expanded upon the authors' theoretical integration approach in an attempt to extend the model to a new population—mothers with young children—and a new intervention—PWI (see Figure 2).

Self-efficacy is a key construct found in both the TTM and TPB models. Self-efficacy is related to the confidence an individual needs to possess in order to overcome a



*Figure 2.* Schematic representation of the proposed relationships among the processes of change, theory of planned behavior, and stage of change. Adapted from “Integrating the Theory of Planned Behavior With the Processes and Stages of Change in the Exercise Domain,” by K. S. Courneya and T. M. Bobick, 2000, *Psychology of Sport and Exercise*, 1, p. 44. Copyright 2000 by Elsevier Science Ltd.

high-risk circumstance without relapse into an unhealthy habit (Bandura, 1977, 1986, 1992). Self-efficacy is connected to decisional balance (i.e., pros and cons) and temptation. Decisional balance is a key construct that is found in the TTM model (DiClemente et al., 1991; Prochaska & Velicer, 1997). The notion of temptation is also shared by both TTM and TPB models. Temptation addresses the urges an individual experiences to engage in a specific habit when they find themselves in the midst of a difficult situation (Prochaska & Velicer, 1997). In the case of the current project, he or she may experience an intense emotion that causes them not to want to exercise (Grimley et al., 1994; Prochaska & Velicer, 1997). By self-monitoring and self-assessing one’s own behavior, an individual is much more likely to engage in exercise behavior change (Winters, Petasa, & Charlton, 2003). In TTM, temptation is at its highest point in the precontemplation stage which means self-efficacy is at its lowest point. As the person

gains more confidence and slowly improves, they start to progress through the stages of change. It is when they reach the action stage that temptation and self-efficacy become equal (Hausenblas et al., 2001; Prochaska & Velicer, 1997).

It is important to acknowledge the fact that there are several significant differences between the TPB and TTM models. One difference is that the TPB model is more advanced and comprehensive in explaining why people change their behaviors. The pros and cons from the TTM model are comparable to the behavioral beliefs in the TPB model, but are not weighted in the expectancy-values formula as they are in the TPB model. Furthermore, the TPB model encompasses a global assessment of attitudes and is operationalized only in terms of values. Once the global assessment of attitudes is completed, TPB researchers are able to examine and summarize individuals' beliefs (i.e., pros and cons) towards changing their behavior as it relates to exercise (Courneya & Bobick, 2000; Girling-Butcher et al., 2006). When evaluating behavioral beliefs in both TPB and TTM, studies showed that a large portion are control-related constructs (i.e., PBC and self-efficacy, respectively). As such, researchers have identified a need for theoretical and empirical research addressing this issue.

With the ability to understand the various stages of change and the relationships between them, the TTM model starts to develop its foundation (e.g., Ajzen, 1991; Courneya & McAuley, 1995; Courneya, Estabrooks, & Nigg, 1997; Lee, 1993; Sonstroem, 1998) within the exercise domain. It is here where the theoretical integration of the two models is most salient. This theoretical integration continues the TPB approach of describing the relationships among the independent constructs rather than simply between the independent and dependent constructs. Moreover, the TTM

construct, behavioral processes of change, was found to be strongly related to perceived behavioral control (TPB) over exercise, which is especially important in the later stages of change (TTM). Much of the foundation of research pertaining to the exercise domain has been based on processes of change, self-efficacy, and pros and cons in terms of discriminating within the stages of change (Marcus & Owen, 1992; Marcus, Selby, Niaura, & Rossi, 1992b). All of these factors were addressed in the integration model used in the current study.

### **Traditional Methods Versus Intervention Method**

Traditional methods of regular physical activity contribute positively to physical and psychological health (United States Department of Health and Human Services, 1996, 1999, 2000). Despite the efforts of government, public, and private organizations to increase physical activity levels, over 40% of Americans are sedentary (National Center for Health Statistics, 1995). This has led healthcare professionals and researchers to develop exercise interventions based on theoretical models of behavior change in an attempt to increase physical activity levels (e.g., Marcus et al., 1992a).

Most traditional exercise programs are conducted with an instructor in a class setting and with a large number of participants. Traditional settings show very little interaction between the participant and instructor. In response to the shortcomings of traditional exercise programs, a new exercise intervention was developed by this researcher using the internet as a central resource for constant communication with participants. The PWI intervention website was a safe place where participants were able to express their daily challenges, attitudes, and constraints towards exercising.



What made the PWI intervention different from traditional exercise programs was its personal approach, which incorporated direct input from the participant into the development of their exercise program. Moreover, a life coach was available constantly to provide support, and the added element of the PWI website also allowed participants to visually track their personal progress throughout the 6 weeks. This visual progress tracker served as a motivator in itself. Ultimately, it was expected that the PWI intervention would affect all aspects of individual and social health by increasing exercise in participants.

### **Explanatory Section**

Please refer to Figures 3 and 4 for this section.

The following concepts are included in the PWI intervention.

- Behavioral beliefs (TPB) are formulated by attitudes, subjective norms, and perceived behavioral control (Vallance et al., 2010). Understanding behavioral beliefs leads to what is behind the intention to change an individual's behavior. The central determinant for this research study has been intention. Behavioral beliefs initiate intention, which spurs motivation to put forth the effort needed to exercise.
- Decisional balance (TPB) are the processes used to initiate a healthy decision by reviewing the pros and cons, and the advantages and disadvantages to exercise. Decisional balance measures the costs and benefits needed to change a behavior such as the effects of exercise (Janis & Mann, 1977).

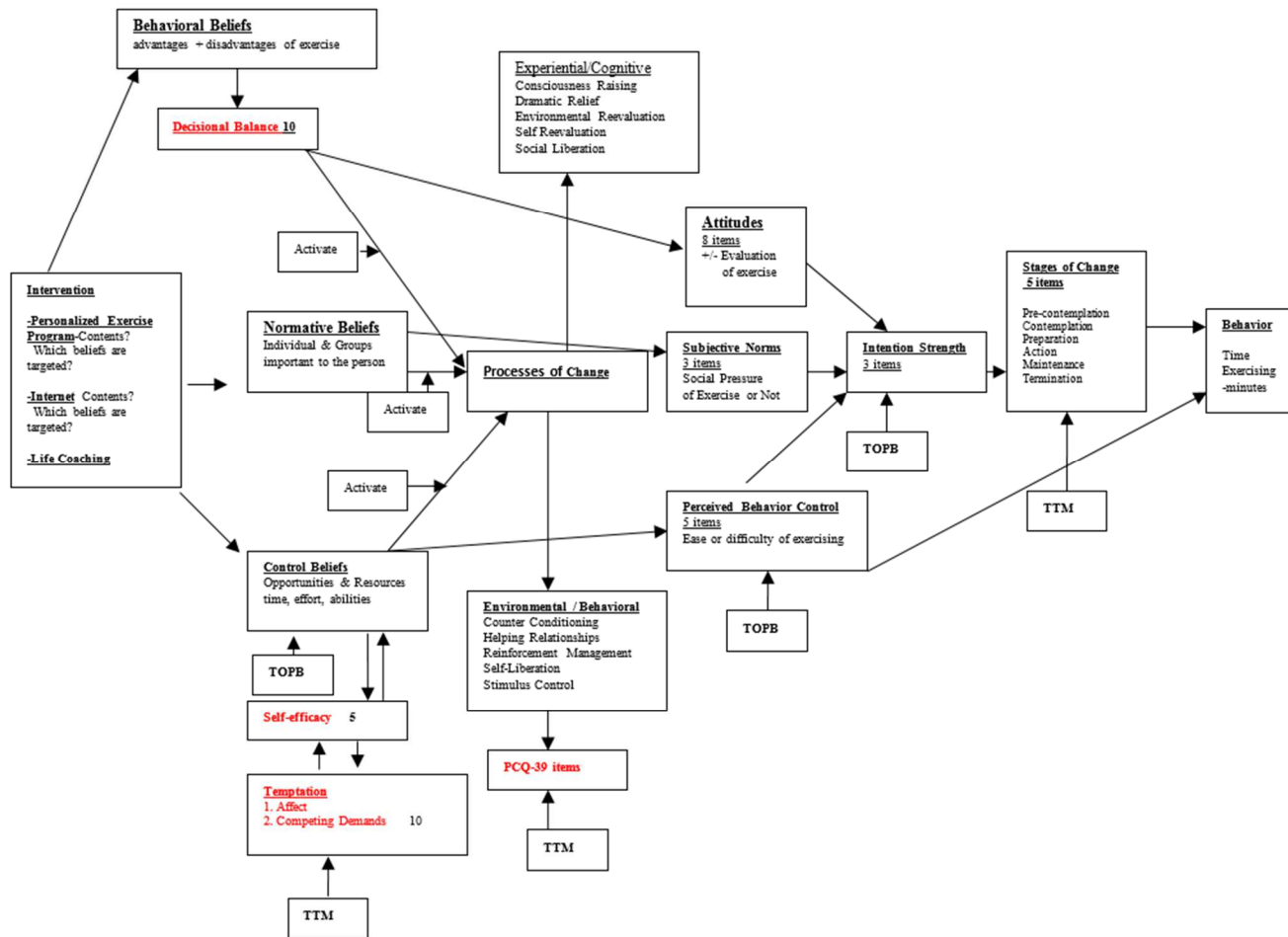


Figure 3. PWI model combined with TTM and TOPB integrated model. Stage-matched intervention (able to fit all exercise programs). Adapted from “Integrating the Theory of Planned Behavior With the Processes and Stages of Change in the Exercise Domain,” by K. S. Courneya and T. M. Bobick, 2000, *Psychology of Sport and Exercise*, 1, p. 44. Copyright 2000 by Elsevier Science Ltd.

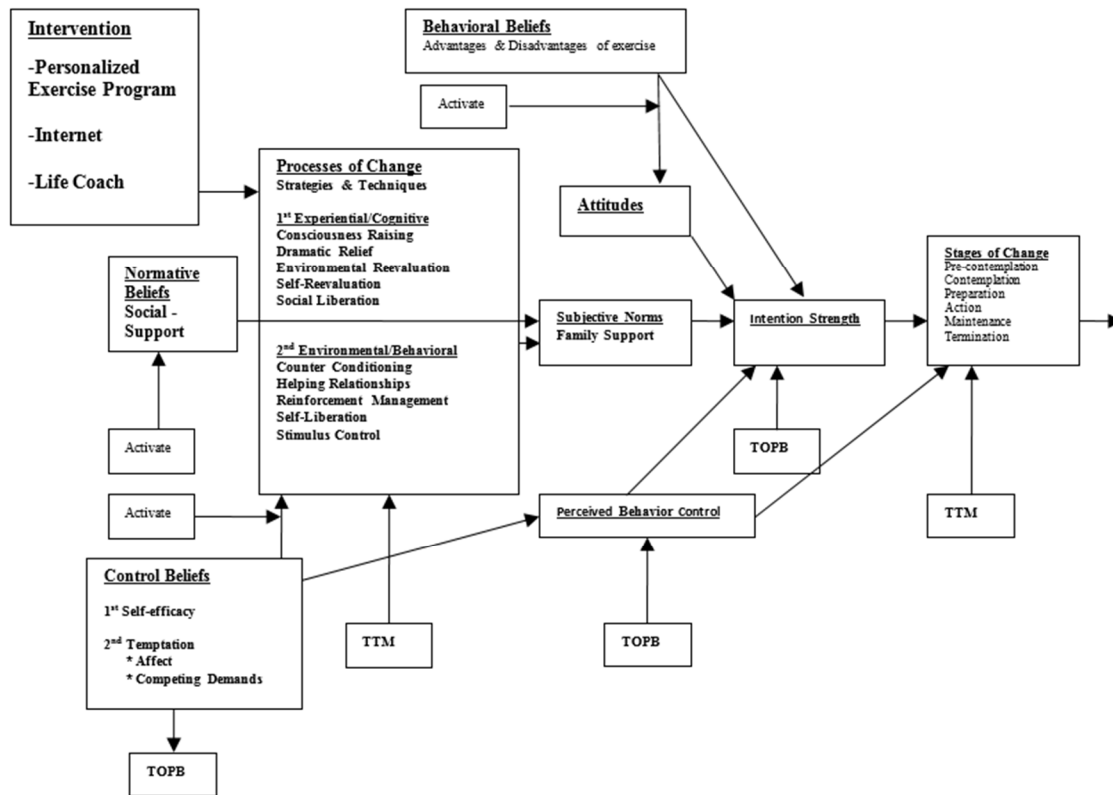


Figure 4. Factors influencing exercise based on the literature. Integrated TTM and TOPB model with intervention included. Stage-matched intervention stage and matched intervention (able to fit all exercise programs. Adapted from “Integrating the Theory of Planned Behavior With the Processes and Stages of Change in the Exercise Domain,” by K. S. Courneya and T. M. Bobick, 2000, *Psychology of Sport and Exercise*, 1, p. 44. Copyright 2000 by Elsevier Science Ltd.

- Normative beliefs (TPB) influence the decisions behind exercise behavior.

Through the influence of individual, social, and/or group attitudes, a behavior choice or belief is developed. Chogahara et al. (1998) discovered that attitudes summarize all the individual beliefs and social influence that are an important and consistent determinant of exercise behavior.

- Control beliefs (TPB) are the ease or difficulty in performing a specific behavior, and they are directly linked to predicting a specific behavior

outcome. Research has shown that control beliefs are derived from the amount of time and effort invested for exercising, including the abilities to perform the exercise (Vallance et al., 2010). Control beliefs are present when opportunities and resources become available for exercising. If engaged in selected exercise behavior, control beliefs become an accurate reflection of the control over the behavior.

- Self-efficacy (TPB) was taken from Bandura's (1986) social cognitive theory and reflects a person's confidence in performing the health behavior change. Self-efficacy may be similar to the underlying control beliefs. Self-efficacy pros and cons have received strong empirical support in the exercise domain in terms of discriminating between the stages of change (Marcus & Owen, 1992; Marcus et al., 1992b).
- Temptation (TTM) is the intensity of urges to engage in a specific habit while in the midst of a difficult situation (Grimley et al., 1994). Temptation and self-efficacy work in direct opposition of each other. This is apparent across the stages of change with temptation being a stronger predictor in relapsing to old habits (Redding & Rossi, 1999).
- Processes of change (TTM) present strategies and techniques to change. Processes of change are divided into two domains, each having five subgroups. The first domain is *experiential (investigative) or cognitive (relating to)* with factors that *define* the process of change: *consciousness raising, dramatic relief, environmental reevaluation, environmental reevaluation, self-reevaluation, and social liberation* towards exercise. The

second domain is *environmental (surroundings) or behavioral (display an act)*, which refers to the factors that *describe* support change: *counter conditioning, helping relationships, reinforcement management, self-liberation, and stimulus control* towards exercising (Bowles, 2006).

### **Predictive Section**

The following concepts are included in the PWI intervention. Please refer to Figures 3 and 4 for this section.

- Attitudes (TPB) are viewed in a positive or negative evaluation while performing the behavior (e.g., good or bad, favorable or unfavorable). Attitudes have been debated as the basic fundamental piece in social psychology. For this reason, attitude is considered to be a strong determinant within exercise behavior (Ajzen, 1991; Bandura, 1977; Godin & Kok, 1996).
- Subjective norms (TPB) assist in the understanding of perceived social pressure and social influences. The reason why subjective norms are so important is that they attempt to understand why or why not there is a desire to exercise.
- Perceived behavioral control (TPB) is defined as the ease or difficulty of performing a targeted behavior that can be traced back to intention. There is a direct prediction to the outcome of the desired behavior. Perceived behavioral control must be an actual reflection of the desired behavior.
- Intention strength (TPB), or commitment, is summarized as a measure of motivation in performing a behavior change. Intention is the forerunner to all

the stages of change. When intention is present, there is an instant decision that is made related to a desire for behavior change. Intention is considered to be the best measure of motivation (Courneya, 1995; Courneya & Bobick, 2000).

- Stages of change (TTM) has six components. Each component provides a definition as to why behavior change happens or does not happen. When there is no desire for change (no desire to exercise) this is called the precontemplation stage (not seriously considering a change), the first stage of change. The second stage is the contemplation stage, which is when an individual is seriously considering making a behavioral change. The preparation stage is the third stage and is known for making small changes to a desired behavior. Action is the fourth stage of change. Within the action stage, the desired behavior is sustained over a period of time and at the appropriate level to bring down the risk of relapse. These first four stages of change are strongly connected to intention. The main focus of the current research project was within the first four stages of change. The last two stages of change, maintenance and termination stages, were not included in this study.

## CHAPTER III

### METHODS

The primary purpose of this study was to determine whether a personalized, stage-based intervention program increased intention toward exercise in mothers of young children. The second aim of this research project was to examine the effects of a physical activity intervention on each participant's level of readiness to change, self-efficacy, and temptation not to exercise. The following sections delineate the participants, procedures, instrumentation, and statistical analysis that was used in this study.

#### **The Power With-in Intervention (PWI)**

The PWI intervention was designed to examine the intention to exercise, temptation not to exercise, and self-efficacy regarding exercise of mothers with young children. An integrated, theoretical-based approach, PWI included a personalized 6-week exercise program, as well as the use of a personalized DVD, access to a website, and life coaching instruction in order to promote change in constructs taken from both the TTM and TPB models. As noted earlier, the work of several scholars has demonstrated the fact that the integration of constructs from the TTM and TPB models allows for a deeper appreciation of behavior change, thus promoting the construction of a more

complex model (Courneya & Bobick, 2000; Dombroski, 2006; Girling-Butcher et al., 2006). These two theoretical models complement each other so well because they address different aspects of an individual's psychological and physiological behavior. TPB focuses on *why* people change (intention), while TTM focuses on *how* people change (belief system) their exercise-related behavior.

As discussed in Chapter I, inclusion of the DVD in the PWI addressed consciousness raising (TTM) and decisional balance (TPB), key constructs from each model. These processes lead to the construction of behavioral beliefs, which consequently strengthen intention—the principal precursor to behavioral change. The participants' interaction with the life coach via the PWI website engaged the healthy relationships (TTM) process, which in turn activated the subjective norms construct of TPB. The development of subjective norms further strengthens an individual's intention to change a behavior. Moreover, the participants' interface with the PWI website could potentially lead to a process of change activity such as self-liberation (TTM)—more commonly referred to as willpower—which activates the TPB construct of perceived behavioral control.

It is important to note that in addition to intention, the PWI intervention engages three other important constructs that are shared by TTM and TPB, which are temptation, decisional balance, and self-efficacy. Detailed definitions of these constructs were presented in the previous chapters. In sum, the intervention is designed to be adapted to participants' responses to questionnaires in regards to decisional balance, the processes of change, self-efficacy, physical activity, temptation not to exercise, and readiness to change. The individual questionnaires (instruments), procedures, and data analysis



related to these theoretical constructs and processes are discussed later in this chapter.

### **Participant Selection Criteria**

A total of 48 women were included in the current study. The participants were recruited through word of mouth, phone calls, emails, and contact at their local health clubs. Participants were only recruited from North Carolina, Utah, California, Massachusetts, and Pennsylvania. Based on a power analysis with an anticipated effect size of .30, alpha equal to .05, a correlation of .70 between pre- and posttest scores, and a power of .80, a sample size of 12 people per group would be required for this study. Assuming an attrition rate of 30%, the groups were oversampled by 4 people for each group. Participants were required to provide certain information in order to determine whether they met the selection criteria for the study. The criteria included age of the participant, age of their children, marital status, and yearly income. Participants were also required to sign a consent form (see Appendix I) in order to participate in the study. Exclusion criteria included severe orthopedic conditions that would preclude participation in a physical activity program. Participants were required to complete 75% of the exercise sessions and were not allowed to be in the precontemplation, maintenance, or termination stages of change. Women who were pregnant or planning on becoming pregnant during the 6-week study were not excluded from the study.

### **Instruments**

The major constructs from the TTM and TPB models were assessed to determine the role they play in the intention to exercise as a result of participating in a 6-week

personalized, stage-targeted exercise program. The measures of the constructs of TTM and TPB have been used in previous research. A prospective, pretest-posttest control group design using a mediated analysis was used in the current study. The following instruments were used at the pretest, posttest, and or follow-up periods.

### **Survey of Demographic Data**

The purpose of the Demographic Data Questionnaire (see Appendix A) was to gather information on potential participants in order to determine their eligibility to participate in the study. The survey contained eight questions related to the age, marital status, employment, family situation, and household income of potential participants.

### **Readiness To Change Questionnaire**

The Readiness To Change Questionnaire (TTM; see Appendix E) was used to measure the strategies and techniques that participants used to modify their behaviors. Participants were asked to recall the past month and to rate the frequency in occurrence of each of the 30 items presented on the questionnaire. Participants rated each item based on a 5-point Likert-type scale with one being never and five being repeatedly. These 10 processes of change were subdivided into cognitive-experiential and behavioral-environmental factors. The personalized, stage-targeted exercise program used in this study used selective strategies and techniques to modify behavior.

### **Decisional Balance Questionnaire**

The Decisional Balance Questionnaire (TTM; see Appendix B) was designed to assess the participants' attitudes as they pertain to exercise (DiClemente et al., 1991). The questionnaire utilizes a 5-point Likert-type scale, which ranges from not at all important to extremely important, and contains 10 total questions designed to provide an accurate understanding of the participants' perceived pros and cons in relation to physical exercise (Marcus, Rakowski, & Rossi, 1992). In general, pros increase and cons decrease across the stages of change (Courneya & Bobick, 2000; Girling-Butcher et al., 2006; Gorely & Gordon, 1995; Marcus & Owen, 1992; Marcus, Rossi et al., 1992; Nigg & Courneya, 1998). The questionnaire consisted of 10 pro items and six con items and was scored by subtracting the sum of the pro items from the sum of the con items.

### **Subjective Norm Questionnaire**

The Subjective Norm Questionnaire (TPB; see Appendix G) is designed to measure normative beliefs. Participants are presented with three statements regarding the importance of the opinions, support, and encouragement to exercise that they receive from those who matter the most to them. They are asked to rate each statement using a 7-point Likert-type scale with one being strongly disagree and seven being strongly agree. This psychometric scale is the most widely used in psychological studies of this nature that measure an individual's attitudes or opinions (Bowling, 1997). The advantage of a Likert scale is that unlike yes-no surveys, Likert-type scales allow for degrees of opinion or attitude, enabling more nuanced data collection. However, like any type of survey, there is the risk of social desirability compromising the measurement, where respondents

might feel pressured to lie in order to avoid social humiliation or stigmatization (Burns & Grove, 1997). The fact that the questionnaires conducted for this study were not anonymous slightly compounds the potential for compromised measurement. This questionnaire provides a measure of perceived social pressure that individuals feel to exercise.

### **Temptation Not to Exercise Questionnaire**

The purpose of the Temptation Not to Exercise Questionnaire (TTM; see Appendix D) served to measure participants' level of temptation (Hausenblas et al., 2001). The questionnaire contained 10 items that assessed the intensity of participants' temptation not to engage in physical activity. The questionnaire presented participants with 10 situations and asked them to rate their temptation not to exercise based on each situation. These situations were equally divided between two components: competing demands, such as lack of time, too busy; and affects, such as anger, stress, and satisfaction. Participants rated their temptation level for each situation using a zero to 100 % scale with zero being not tempted at all, 50 being somewhat tempted, and 100 being extremely tempted. While there was some potential for compromised measurements due to the same issue of social responsibility mentioned earlier, the fact that there was a wider range of choices allowed participants to feel more secure and less exposed when responding. The questionnaire was scored by measuring the sum of all the answers; greater amounts of temptation to not exercise were indicated by a higher score (Hausenblas et al., 2001).

### **Self-Efficacy Questionnaire**

The Self-Efficacy Questionnaire (TTM ; see Appendix F) looked at each participant's level of confidence to engage in physical activity when presented with outside distractions. In their 1998 research, Benisovich, Rossi, Norman, and Nigg developed six different components that measured self-efficacy and accurately predicted exercise behavior. The components are negative affect, excuse making, exercising alone, access to equipment, resistance from others, and weather. As part of the questionnaire, participants were presented with three items for each of these six components, and then asked to rate how each item relates to them in their leisure time. The questionnaire used a 5-point Likert-type scale with one being not at all confident and five being completely confident. As previously discussed, a Likert scale allows for more degrees of attitude or opinion, but may also be affected by individuals' sense of social responsibility.

### **Intention Questionnaire**

The Intention Questionnaire (TPB; see Appendix H) was used to determine the participants' intention to engage in physical activity. To begin with, participants were again presented with the following definition of exercise: "Any planned physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per week for 20–60 minutes per session" (Sharifirad, Charkazi, Tashi, Shahnazi, & Bahador, 2011, p. 72). Participants were then presented with three statements and asked to rate how well each statement expressed their own intention toward exercise. This was accomplished by using a 7-point Likert-type scale with one being strongly disagree and seven being

strongly agree. The questionnaire was scored by taking the sum total of the answers.

### **Stages of Change Short Form**

The Stages of Change Short Form (see Appendix C) was used to place each participant within their respective stage of change, namely, precontemplation, contemplation, preparation, action, maintenance, and termination (Marcus et al., 1992a; Norman et al., 1998). Participants were then presented with five statements representing each stage of change and asked to mark the one statement that applied to their current exercise status. The items were arranged so that if the first item was endorsed, the individual was placed in the precontemplation stage, if the second item was endorsed, the individual was categorized in the contemplation stage, and so on up to the fifth item, which represented the maintenance stage. This assisted the researcher in determining who was applicable for the study, since those who fell into the precontemplation, maintenance, and termination stages were excluded from the project. Other participants were excluded from the study if they did not fall within the required age range (16–44), did not have dependent children, or had health complications that did not allow for physical exercise.

### **Study Procedures**

After an introductory meeting with the primary researcher and the completion of the required pretest questionnaires, each qualifying participant was randomly assigned to either the intervention group or one of two control groups. Randomization was accomplished by using a lottery method with the restriction that an equal number of

participants were in each group.

The pretest phase consisted of completing a number of questionnaires, which were described in the previous section. Participants did not receive any compensation or gift for their participation in the study, and participation was completely voluntary throughout the 6-week process. Each participant returned the completed questionnaires to the researcher by mail or email. Once all of the questionnaires were completed, the researcher briefly spoke with each of the study participants to provide instructions over the telephone. The first control group, known as the traditional exercising group (TEG), attended exercise classes of their choosing. These classes were primarily aerobic dance classes of continuous movement. All classes attended by TEG participants were reviewed and approved by the researcher prior to the beginning of the study. It has been suggested that physically active participants are an appropriate control when evaluating the effectiveness of an alternative exercise program (Booth & Lees, 2006). A second control group, the individual exercising group (IEG), were given even less instructions than the first, and were expected to participate in their own exercise program with no supervision or prior approval. This group represented what most likely occurs in mothers of dependent children who are not part of any organized study, program, or intervention. Members of the two control groups, TEG and IEG, were provided with daily logs, which were to be filled out and returned to the researcher on a weekly basis. The logs included a place for participants to record the duration and type of workout.

In contrast to the control groups, participants in the PWI intervention group spoke individually with the researcher over the telephone to verify which stage of readiness they were currently in and to discuss and determine the exercise program that best met

their lifestyle, including their schedule, physical fitness level, and any specific health concerns they had. Following this telephone interview, participants received an individualized three-phase exercise program that lasted for 6 weeks, which was tailored specifically to the participants' needs, desires, and stage of change. The majority of the exercise programs included walking as the main mode of exercise. Duration and or intensity were modified as the 6-week study progressed. The first phase included a 20- to 25-minute aerobic workout to be followed during the 1<sup>st</sup> and 2<sup>nd</sup> weeks of the intervention. The second phase included a 30- to 35-minute aerobic workout designed for weeks 3 and 4. Finally, the third phase was comprised of a 40- to 45-minute aerobic workout to be followed during weeks 5 and 6. Intensity was increased through gradually increasing the speed of the primary mode of aerobic exercise. Each of the workout phases were intended to be used at least three times each week, but were modified based on the participants' individual needs, desires, and stage of change. Some of the participants received additional toning exercises to supplement their aerobic workout as requested by the individual. Participants in the PWI were given access to the PWI website (see Appendix K) and were required to fill out a daily online exercise log. These logs were evaluated daily by the researcher. In addition to the personalized exercise program and website, participants in this group received continuous life coaching and educational support from the primary researcher throughout the 6-week study (Appendix R and Appendix T).

The specific stage of change of each participant was also taken into account when designing the individualized exercise programs. Those women who were only in the contemplation stage were provided with less rigorous exercises in order to ease them into



a regular fitness routine. They were also given extra support by the life coach, providing them with the motivation they needed to strengthen intention and lead them towards behavior change. Participants in a later stage of either preparation or action were provided with an increasing amount of independence by the life coach as their intention became stronger. Physical exercises provided to individuals in the preparation stage were still relatively light, but emphasized repetition and routine more than the exercise program for those in the contemplation stage. Individuals in the most advanced stage included in the study, the action stage, were provided with more rigorous and lengthy exercise programs that were designed to help the participant: (a) maintain the level of fitness they had achieved up to that point, and (b) target specific problem areas for toning or strengthening as requested by the individual. As the 6-week intervention progressed, many participants did move into another stage of change, and when this occurred their exercise program was adjusted accordingly.

The exercise intervention lasted 6 weeks, after which the participants in each of the three study groups were asked to complete the same questionnaires, with the exception of the Survey of Demographic Data, for the second time as part of a posttest. Completed questionnaires were either mailed or emailed to the researcher.

For participants who experienced mild soreness or pain in their knee, hip, or back, the exercise program was modified by reducing the amount of time they participated in the aerobic workout and assigning alternative, lower-impact exercises as a supplement to the original program. If needed, participants experiencing pain or discomfort rested for 1 to 2 days before beginning the exercise program again.

Participants in the PWI intervention had access to the primary researcher through

the PWI website (<http://powerwith-in.com>). When logged on, participants had access to motivational material, support sites, as well as updates from the primary researcher and a wealth of other exercise-related information they could browse through. Participants were also required to complete daily exercise logs via the website and encouraged to leave posts that included questions, comments, and success stories. The exercise logs included sections about the time of day, length, and type of exercise, as well as any thoughts or feelings the participant had while exercising. The components of the website are addressed in relation to the TTM and TPB models in the following section.

Participants in the PWI intervention also had access to life coaching. The primary researcher provided this coaching throughout the 6-week intervention via the website. Moreover, participants had access to the primary researcher via the telephone. The role of the life coach was to facilitate change by monitoring and evaluating each participant's progress each week and by working with them to set goals for the week ahead. The theoretical significance of the life-coaching role is discussed below.

### **Explanation of Experiential and Cognitive Domains and Strategies and Techniques**

The rating system found on the PWI website enabled participants to record their progress and opinions of their exercise program. This process of recording is considered to be *self-reevaluation*. Self-reevaluation is the first of 10 processes of change that was used in the development of the PWI intervention group. Self-reevaluation lends to the understanding of the attitudes of mothers of young children, and their emotional and cognitive behavior as it relates to exercise. The second process of change was

*consciousness raising*. Consciousness raising refers to the amount of effort put forth by the individual to seek out new information and to gain understanding and feedback about the problem behavior. When some participants logged on to the PWI website, they would post questions pertaining to health and fitness. The PWI life coach (researcher) would respond to their questions directly on the website.

The third process of change was *environmental reevaluation*. Environmental reevaluation was conducted through the battery of interview questions designed by the researcher at the beginning of the study. As the questions were given, the participants made an assessment of their various behavioral problems and or temptations that interfered with exercise. Participants were also asked how these behavioral problems affected their own physical and social environments. As we have learned from the review of literature, mothers of young children were challenged most with time (problem) restraints. The fourth process was *social liberation*. Participants in the PWI intervention group made a choice to be part of a 6-week intervention that shows a level of awareness to new ideas, availability to make time for something of importance to them, and willingness to take a risk by exploring alternative approaches to behavior change. It is at this point that participants demonstrate *openness for a new opportunity* towards a behavioral change. The fifth is *dramatic relief* as participants discuss with the researcher their reasons for not exercising and the problems they have encountered in the past in response to questions she provided. The discussion led to questions regarding what affected the behavior change process for them, and whether there were emotional experiences that were related to the problem behavior which may have caused avoidance to behavioral changes.

## **Explanation of the Environmental-Behavioral Domains and Strategies and Techniques**

The participants' choice to be part of the 6-week intervention allowed the researcher to study the first area of *self-liberation*, also known as individual choice and commitment in changing a problem behavior (temptation to not exercise). To activate self-liberation, one must have the belief that he or she has the ability to change their problem behavior. When participants developed a problem with their exercise program, a substitution of an alternative behavior was discussed and determined prior to being put into place. The second area was *counter conditioning* the problem behavior. Every 2 weeks, changes were made to the PWI group's exercise program in order to increase their conditioning level by lengthening the duration and intensity of their exercise program. The third area was *reinforcement management*, which means the ability to adjust calmly to changes that are made to the exercise program in order to remain committed to the behavioral change. The fourth area was *stimulus control*, which is how mothers of young children show control over a situation that triggers a problem behavior, while staying committed to their desired behavioral change. The fifth area of importance was the development of trust, acceptance, and support between the participant and researcher and the individual's confidante. The confidante was a sponsor of sorts from a participant's inner network who was designated by the participant at the beginning of the intervention to serve as a source of emotional support and encouragement throughout the program. The development of this confidence and trust in each other activated the enhancement of *helping relationships*. As mothers of young children found that they needed help with their children, their exercise program, and any lifestyle changes, they were motivated to

become more comfortable with accepting the help of others including family members, partners, friends, and the researcher.

### **Potential Confounding Factors**

The intention to exercise among women with dependent children ranging in age from infancy to 17 years of age may be influenced by a mother's age, the age of her children, her current stage of change, and income. Demographic data were collected during the pretest period prior to each of the participants being randomly assigned to one of the three groups.

### **Statistical Methods and Design**

Normal data cleaning procedures were used. For any self-report measure in which only one item was missing, the mean of the remaining items for that participant was used to estimate missing values. Participants with more than one item missing on any scale were not included in the final analysis. Demographic data from individuals with missing data were compared to individuals with complete data in each group to determine sampling bias. Potential outliers were identified with graphical plots and tests of discordance. All measures with multiple items were checked for internal consistency and reliability. The data were summarized descriptively and credibility was established by comparing the statistical summaries to similar exercise-based research. Distributional and statistical assumptions were tested and a conditional matrix involving all measures was integrated before influential statistical analyses were performed.

This data collection resulted in an efficacy analysis using a mediational approach

to analysis, which used both regression and ANOVA. The effect of type of exercise on intention to exercise was assessed initially by a 3 x 2 factorial mixed repeated measures analysis. If a significant relationship was found, the mediational role of the belief constructs from the integrated model was analyzed using a MANOVA. If the MANOVA was significant, multiple ANOVA's with a Bonferroni alpha-adjustment and Tukey's HSD post hoc tests were used to follow up on any significant differences. The third step in the analysis was to use an OLS regression analysis (BLUE) to determine the relationship between beliefs and the intention to exercise. The mediational analysis was concluded using an OLS regression analysis (BLUE) in which the treatment groups (using dummy coding) and beliefs were regressed on the intention to exercise (Baron & Kenny, 1986). An alpha level of .05 (unless adjusted) was used for all statistical analyses. Eta squared was used to determine the meaningfulness of the results.

## CHAPTER IV

### RESULTS

The purpose of this study was to determine if a 6-week, home-based personalized exercise program increased intention to exercise, increased decisional balance beliefs and behaviors, increased self-efficacy, and decreased the temptation to not exercise. This chapter is organized to present the results under the following main sections: description of participants, data analysis, and summary. Data analysis and calculations were performed using SPSS version 15.0.

#### **Description of Participants**

A total of 38 mothers of young children took part in this research project. All participants completed a pretest for screening purposes and were randomly assigned to a group. A phone interview was scheduled with each participant. The phone interview was used for additional questioning to understand the participants' level of commitment to the 6-week assignment. Once the phone interviews were completed, the primary investigator determined that some participants needed to be reassigned into a different group for various reasons. Based on the results of the phone interview, it was determined that only 9 participants could afford a traditional exercise class. This resulted in 9 participants in the traditional group, 11 participants in the individual group, and 14

participants in the PWI intervention group. Two participants discontinued participation in the study: A participant in the individual group who had ankle-related problems, and another from the PWI intervention group who had work-related problems. The data corresponding to these 2 participants were eliminated from the analysis. Of the 36 participants in the treatment, 34 completed all 6 weeks of the exercise study.

All participants lived in the United States. The majority of the participants were from the East Coast: 25 lived in Pennsylvania, 6 in Utah, 2 in California, and 1 in Massachusetts. A majority of the women were married ( $n = 28$ ), with a few who were single ( $n = 6$ ). There were 11 women who did not work, 14 who worked inside the home, and 13 who worked outside the home. Of those 27 employed women, 7 were full time. The average household income was \$50,000 or more (see Table 1). The average age of the participants was 40 years old. The average number of children among the participants was three children (see Table 2).

### **Data Analysis**

The intervention (PWI) was a 6-week, home-based personalized exercise program designed to increase intention to exercise, increase beliefs and behaviors in decisional balance, increase self-efficacy, and decrease the temptation to not exercise. The raw data from the questionnaires were entered into a SPSS 15.0 data file. Prior to any statistical analysis, all data were cleaned and inspected to ensure reliable data entry by conducting a thorough data entry check.

For any data representing a self-report measure in which only one item was missing, the mean of the remaining items for that participant was used for the missing



value. Participants with more than one missing item on any scale were not included in the final analysis. The first step in the preliminary analysis involved identifying the missing values and outliers. The missing values were handled as described above. The outliers were detected using box and whisker plots and were then eliminated from the study; the data for these participants were therefore not used. This led to a total of 34 women in the study.

For descriptive purposes, the means and standard deviations for each variable across both time and group assignment are shown in Table 2. Research questions 1–3 were analyzed by computing a two-way (Groups X Time) mixed effects ANOVA model for each variable. Groups (X Time) served as the between-subjects variable. Time (X Groups) served as the within-subjects variable. The participants' effects were random, measured, and fixed. A Bonferroni correction was calculated due to the multiple comparisons. Thus, alpha was set at .025. It was hypothesized that a significant interaction would occur, indicating that change from pretest to posttest was dependent on group assignment.

Conceptually, the interaction term in the 2 x 2 ANOVA can be thought of as a comparison of the changes from pretest to posttest relative to the within-subjects effects and the between-subjects effects from each group. If the changes from pretest to posttest were identical in each group, indicating that the improvement was the same for each group, then there would be no interaction. If the changes from pretest to posttest were greater in one group than the other group, indicating that one group improved more than the other group, then there would be an interaction. An interaction could also occur if one group improved from pretest to posttest while the other group deteriorated or stayed

Table 1

*Demographic Characteristics of the Study Sample*

	T Group ( <i>N</i> = 9)	I Group ( <i>N</i> = 11)	PWI Group ( <i>N</i> = 14)
Average age	40	35	40
Average number of children	2	2	3.5
Married	4	11	13
Not married	5	0	1
Not working	3	4	5
Working inside home	2	4	8
Working outside home	4	6	3
Full-time	0	5	2
Part-time	5	5	6
Average income	50+	50+	50+

*Note.* *N* = 34; T = Traditional; I = Individual; PWI = Power With-In

Table 2

*Demographic Statistics*

Variables	Mean	<i>SD</i>	Minimum	25 <sup>th</sup> percentile	Median	75 <sup>th</sup> percentile	Maximum
Ages (years)	38.2	7.7	25.0	31.3	40.5	44.0	54.0
# of Children	2.7	1.3	1.0	2.0	3.0	4.0	5.0
Work (hrs/wk)	18.8	19.5	0.0	0.0	13.5	32.5	60.0
Exercise (hrs/wk)	2.5	1.7	0.0	1.0	2.0	3.9	6.0

*Note.* *N* = 34.

the same. An interaction where the PWI intervention group would experience an increase in each variable in research questions 1–3 compared to mothers in the traditional group and individual group was predicted. The results for each research question are presented in the following sections.

### **Intention to Exercise**

The first research question and hypothesis for this study were as follows:

- Research Question 1: What effect does the PWI intervention have on the intention to exercise?
- Hypothesis 1: Mothers in the PWI intervention group will experience a greater increase in intention to exercise compared to mothers in the traditional group and individual group.

The participants in each group were given a 3-question Likert-type questionnaire to measure their intention to exercise. The questionnaire had a response range from 1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Moderately Disagree, 4 = Neutral, 5 = Moderately Agree, 6 = Somewhat Agree, and 7 = Strongly Agree. The question of interest was whether the improvement in scores from pretest to posttest was greater for the PWI intervention group compared to the traditional group and individual group.

**Effects of group.** The group by time interaction for Intention to Exercise was not significant,  $F(2, 32) = .057, p = .944$ . Furthermore, the main effect for group was not significant,  $F(2, 32) = .920, p = .409$ . The data show that the time main effect,  $F(1, 32) = 3.747, p = .062$ , was trending toward significance and was thus further investigated. The group by time interaction for Intention to Exercise is shown in Table 3. The main

effect for the group is shown in Table 4.

**Simple main effects for time.** The interaction Means, Standard Errors, and 95% Confidence Intervals for the means for Intention to Exercise are shown in Table 5. Regardless of group assignment, Intention to Exercise decreased from pretest ( $M = 6.071$ ,  $SE = .383$ ) to posttest ( $M = 5.214$ ,  $SE = .515$ ).

### **Cognitive and Behavioral Processes of Change to Exercise**

The second research question and corresponding hypotheses for this study were as follows:

- Research Question 2: What effect does the PWI intervention have on cognitive processes of change and behavioral processes of change?
- Hypothesis 2a: Mothers in the PWI intervention group will experience a greater increase in cognitive processes of change compared to mothers in the traditional group and individual group.
- Hypothesis 2b: Mothers in the PWI intervention group will experience a greater increase in behavioral processes of change compared to mothers in the traditional group and individual group.

In this portion of the study, two subscales were measured, Cognitive Processes of Change, and Behavioral Processes of Change, using the Readiness to Change Questionnaire. A 5-point Likert-type questionnaire was used with 1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, and 5 = Repeatedly.

Table 3

*Within-Subjects Effects: Intention to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	8.350	1	8.350	3.747	.062
Time *	.256	2	.128	.057	.944
Group					
Error (time)	71.315	32	2.229		

Table 4

*Between-Subjects Effects: Intention to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Group	3.266	2	1.633	.920	.409
Error	56.777	32	1.774		

Table 5

*Intention to Exercise Estimated Marginal Means of the Intention Scores*

Intention	TIME	Mean	Std. error	95% Confidence interval	
				Upper bound	Lower bound
All groups	Pre	6.071	.383	6.852	5.291
	Post	5.214	.515	6.264	4.164

**Analysis for cognitive processes of change to exercise.** The group by time interaction for Cognitive Processes of Change to Exercise was not significant,  $F(2, 31) = 1.004, p = .378$  (see Table 6). Furthermore, the main effect for group was not significant,  $F(2, 31) = .499, p = .612$  (see Table 7). The time main effect,  $F(1, 31) = 1.278, p = .267$  (see Table 6), was also not significant.

**Analysis for behavioral processes of change to exercise.** The group by time interaction for Behavioral Processes of Change to Exercise was not significant,  $F(2, 31) = .849, p = .438$  (see Table 8). Furthermore, the main effect for group was not significant,  $F(1, 31) = .254, p = .618$  (see Table 8). The time main effect,  $F(2, 31) = 1.120, p = .339$  (see Table 9), indicates that it was also not significant.

The Behavioral Processes of Change to Exercise showed no significant change from pretest to posttest based on the results of the ANOVA for the within-subjects effects and between-subjects effects (see Figure 5).

### **Decisional Balance: Behavioral Beliefs, Normative Beliefs, and Control Beliefs to Exercise**

The third research question and corresponding hypotheses for this study were as follows:

- Research Question 3: What effect does the PWI intervention have upon behavioral beliefs, normative beliefs, and control beliefs in decisional balance?

Table 6

*Within-Subjects Effects: Cognitive Processes of Change to Exercise*

Source	Time	Type III Sum of Squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	Linear	.115	1	.115	1.278	.267
Time * Group	Linear	.181	2	.090	1.004	.378
Error (time)	Linear	2.794	31	.090		

Table 7

*Between-Subjects Effects: Cognitive Processes of Change to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial Eta squared
Intercept	761.511	1	761.511	1032.719	.000	.971
Group	.736	2	.368	.499	.612	.031
Error	22.859	31	.737			

Table 8

*Within-Subjects Effects: Behavioral Processes of Change to Exercise*

Source	Time	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	Linear	.049	1	.049	.254	.618
Time * Group	Linear	.328	2	.164	.849	.438
Error (time)	Linear	5.996	31	.193		

Table 9

*Between-Subjects Effects: Behavioral Processes of Change to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial Eta squared
Intercept	661.483	1	661.483	947.961	.000	.968
Group	1.563	2	.782	1.120	.339	.067
Error	21.632	31	.698			

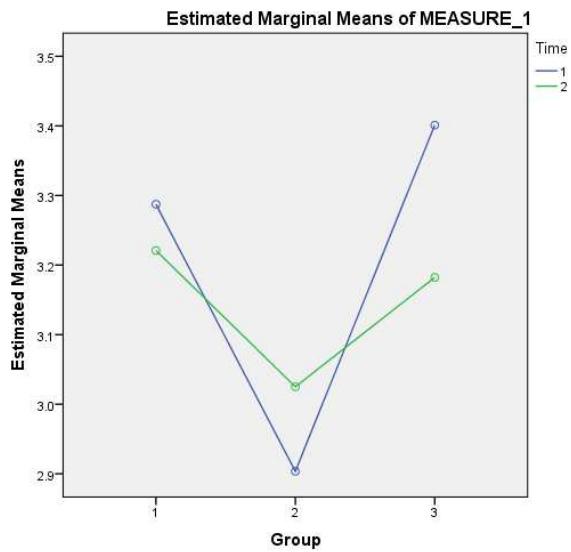


Figure 5. Cognitive and behavioral processes of change to exercise.



- Hypothesis 3a: Mothers in the PWI intervention group will experience a greater increase in behavioral beliefs in decisional balance compared to mothers in the traditional group and individual group.
- Hypothesis 3b: Mothers in the PWI intervention group will experience a greater increase in normative beliefs in decisional balance compared to mothers in the traditional group and individual group.
- Hypothesis 3c: Mothers in the PWI intervention group will experience a greater increase in control beliefs in decisional balance compared to mothers in the traditional group and individual group.

In this portion of the study, Decisional Balance was measured. The three subscales comprised Decisional Balance in Behavioral Beliefs, Control Beliefs, and Normative Beliefs. Behavioral Beliefs were measured using the Decisional Balance Questionnaire. The Likert-type scaling of this questionnaire ranged from 1–5: 1 = Extremely Important, 2 = Quite Important, 3 = Somewhat Important, 4 = A Little Bit Important, and 5 = Not Important. Control Beliefs were measured by using the Temptation Not to Exercise Questionnaire. This Likert-type questionnaire used a percentage scale with 0–20% = Not Tempted at All, 40–70% = Somewhat Tempted, and 80–100% = Extremely Tempted. Lastly, Normative Beliefs were measured using the Subjective Norms Questionnaire. This questionnaire had three questions with a Likert-type scaling: 1 = Strongly Disagree, 2 = Somewhat Disagree, 3 = Moderately Disagree, 4 = Neutral, 5 = Moderately Agree, 6 = Somewhat Agree, and 7 = Strongly Agree.

**Analysis for behavioral beliefs to exercise.** The group by time interaction for Behavioral Beliefs to Exercise was not significant,  $F(2, 31) = .230, p = .796$  (see Table

10). Furthermore, the main effect for group was not significant,  $F(2, 31) = .762, p = .475$  (see Table 11). The time main effect,  $F(1, 31) = .029, p = .865$  (see Table 11), was also not significant.

**Analysis for normative beliefs to exercise.** The group by time interaction for Normative Beliefs to Exercise was not significant,  $F(2, 31) = .145, p = .866$  (see Table 12). Furthermore, the main effect for group was not significant,  $F(2, 31) = 2.080, p = .142$  (see Table 13). The time main effect,  $F(1, 31) = .580, p = .452$ , was also not significant (see Table 13).

**Analysis for control beliefs to exercise.** The group by time interaction for Control Beliefs to Exercise was not significant,  $F(2, 31) = .262, p = .771$  (see Table 14). Furthermore, neither the main effect for group, nor the main effect for time were significant,  $F(2, 31) = .126, p = .882$  (see Table 14), and  $F(1, 31) = .002, p = .966$  (see Table 15), respectively.

### **Self-Efficacy Beliefs to Exercise**

The fourth research question and corresponding hypotheses for this study are given below.

- Research Question 4: What effect does the PWI intervention have on self-efficacy beliefs to exercise?
- Hypothesis 4: Mothers in the PWI intervention group will experience a greater increase in self-efficacy beliefs to exercise compared to mothers in the traditional group and individual group.

The Self-Efficacy Questionnaire was used to study the beliefs of the participants. The

Table 10

*Within-Subjects Effects: Behavioral Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Time	.004	1	0.04	.029	.865
Time *	.059	2	.029	.230	.796
Group Error (time)	3.962	31	.128		

Table 11

*Between-Subjects Effects: Behavioral Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Group	.275	2	.137	.762	.475
Error	5.590	31	.180		

Table 12

*Within-Subjects Effects: Normative Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	.535	1	.535	.580	.452
Time *	.267	2	.134	.145	.866
Group Error (time)	29.536	31	.923		

Table 13

*Between-Subjects Effects: Normative Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Group	14.967	2	7.483	2.080	.142
Error	115.137	31	3.598		

Table 14

*Within-Subjects Effects: Control Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Time	.344	1	.344	.002	.966
Time * Group	100.138	2	50.069	.262	.771
Error (time)	5919.333	31	190.946		

Table 15

*Between-Subjects Effects: Control Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Group	87.673	2	43.836	.126	.882
Error	10818.268	31	348.976		

questionnaire is a 5-point Likert-type scale with the following items: 1 = Not at all confident, 2 = Somewhat confident, 3 = Moderately confident, 4 = Very confident, 5 = Completely confident. The question of interest was whether the improvement in scores from pretest to posttest was greater for the PWI intervention group compared to the traditional group and individual group.

**Analysis for self-efficacy beliefs to exercise.** The group by time interaction for Self-Efficacy Beliefs to Exercise was found to be not significant,  $F(1, 36) = 1.000, p = .203$  (see Table 16). Furthermore, the main effect for group was not significant,  $F(2, 31) = 2.000, p = .814$  (see Table 16). The time main effect,  $F(1, 31) = 13.349, p = .431$  (see Table 17), was also not significant.

Table 16

*Within-Subjects Effects: Self-Efficacy Beliefs to Exercise*

Source	Time	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	Linear	.036	1	.036	.203	.655
Time *	Linear	.288	2	.144	.814	.453
Group						
Error (time)	Linear	5.484	31	.177		

Table 17

*Between-Subjects Effects: Self-Efficacy Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean Square	<i>F</i>	Sig.	Partial Eta squared
Intercept	262.466	1	262.466	609.505	.000	.952
Group	.072	2	.036	.083	.920	.005
Error	13.349	31	.431			

### **Stage of Change Beliefs to Exercise**

The fifth research question and corresponding hypothesis for this study are.

- Research Question 5: What effect does the PWI intervention have on stage of change beliefs to exercise?
- Hypothesis 5: Mothers in the PWI intervention group will experience a greater increase in stage of change beliefs to exercise compared to mothers in the traditional group and individual group.

The Stage of Change Short Form Questionnaire (SCQ) was used to measure how a participant rated their level of regular physical exercise. For the purposes of the SCQ, *regular exercise* is defined as any planned physical activity (e.g., brisk walking, aerobics,

jogging, bicycling, swimming, rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per week for 20–60 minutes per session.

Exercise does not have to be painful to be effective but should be done at a level that increases your breathing rate and causes you to break a sweat. Each participant answered one question: Do you exercise regularly according to the definition above? The participant was instructed to then circle ONLY ONE of the following answers: (1) stage = precontemplation (No, and I do NOT intend to exercise in the next 6 months); (2) stage = contemplation (No, but I intend to in the next 6 months); (3) stage = preparation (No, but I intend to in the next 30 days); (4) stage = action (Yes, I have been for LESS than 6 months); (5) stage = maintenance (Yes, I have been for MORE than 6 months).

**Analysis for stage of change beliefs to exercise.** The group by time relationship for Stage of Change Beliefs to Exercise was found to be not significant,  $F(1, 33) = 1.513, p = 3.233$  (see Table 18). Additionally, the main effect for group was not significant,  $F(2, 33) = 2.000, p = .994$  (see Table 18). The time main effect,  $F(1, 33) = 48.700, p = 1.476$  (see Table 19) was likewise not significant.

### Summary

In Chapter IV the research questions and hypotheses were addressed, studied, and evaluated. Comparing pretest to posttest in statistical methods, the data were analyzed and interpretations were given. The data were found to be nonsignificant. Chapter V will discuss the implications of the findings related to seven different instruments, as well as the limitations of the study, recommendations for future research, and final conclusions of the study.

Table 18

*Within-Subjects Effects: Stage of Change Beliefs to Exercise*

Source	Time	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
Time	Linear	1.513	1	1.513	3.233	.081
Time * Group	Linear	.931	2	.465	.994	.381
Error (time)	Linear	15.444	33	.468		

Table 19

*Between-Subjects Effects: Stage of Change Beliefs to Exercise*

Source	Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.	Partial Eta squared
Intercept	573.109	1	573.109	388.349	.000	.922
Group	1.675	2	.837	.568	.572	.033
Error	48.700	33	1.476			

## CHAPTER V

### DISCUSSION

The purpose of this study was to determine whether a 6-week, home-based personalized exercise program would increase intention to exercise, increase decisional balance beliefs and behaviors, increase self-efficacy, and decrease the temptation to not exercise among study participants. This study engaged a quantitative methodology to measure the variables associated with the effects of the 6-week intervention on participants, which was based on an integration of the transtheoretical model (TTM) and the theory of planned behavior (TPB) model. A pretest–posttest control group design was used. Seven instruments were employed in this study to address the research questions, including The Readiness to Change Questionnaire, Decisional Balance Questionnaire, Subjective Norm Questionnaire, Temptation Not to Exercise Questionnaire, Self-Efficacy Questionnaire, Intention Questionnaire, and the Stages of Change Short Form.

This study did not yield significant findings. The hypotheses corresponding to each variable were unsupported by the data, indicating that the home-based personalized exercise program did not have the effect anticipated by the researcher. This chapter discusses the results of the study and provides explanations for the lack of findings for each research question.



## Interpretation of Findings

### Intention to Exercise

The variable of intention to exercise was related to the first research question: What effect does the PWI intervention have on the intention to exercise? The researcher hypothesized that mothers in the PWI intervention group would experience a greater increase in intention to exercise compared to mothers in the traditional group and individual group. The data did not support this hypothesis, however. Data revealed that the intention to exercise of participants across all groups decreased from pretest ( $M = 6.071, SE = .383$ ) to posttest ( $M = 5.214, SE = .515$ ).

Present literature demonstrates that intention—defined as the direction of a person's efforts and actions to achieve a specific result—is a key factor in an individual's commitment and follow-through related to behavior change (Courneya & Bobick, 2000). Courneya and Bobick (2000) confirmed a direct association between intention and behavioral change. In regards to exercise-related behavior change, several studies have identified intention as the most influential variable on the total amount of exercise an individual engages in (Chogahara et al., 1998; Vallance et al., 2010). Given the lack of present literature on the exercise behavior of this population (mothers with young children), there is limited comparable research to compare to this study's findings. However, the decrease in participants' intention likely influenced other anticipated results of the exercise intervention, as the participants did not demonstrate any improvement or advance in their stage of change during the intervention. It is difficult to determine why participants exhibited a decrease in intention by the end of the 6-week intervention.

### **Cognitive and Behavioral Processes of Change to Exercise**

The variables of cognitive and behavioral processes of change to exercise were related to the second research question: What effect does the PWI intervention have on cognitive processes of change and behavioral processes of change? The researcher hypothesized that mothers in the PWI intervention group would experience a greater increase in both cognitive processes of change and behavioral processes of change compared to mothers in the traditional group and individual group. This hypothesis was not supported by the data. There was no significant change in either cognitive or behavioral processes of change among participants across all groups. For behavioral processes of change, no significant change was shown from pretest to posttest for the within-subjects effects or the between-subjects effects.

Processes of change, related to the TTM model, refer to strategies and techniques that individuals employ to achieve behavioral change. Bowels (2006) explained that cognitive processes of change are factors that define the change process through thoughts, while behavioral processes of change are factors that support the change process through action and interpersonal networks. As measured by the Readiness to Change Questionnaire, the participants in this study did not display any notable changes in either their thoughts or actions related to their exercise. The researcher anticipated that the personalized nature of the intervention program would specifically target cognitive and behavioral processes of change, as research by Marcus et al. (2003) demonstrated. Marcus et al. (2003) specifically identified social support as an important behavioral process. As explained in earlier chapters, this researcher strove to provide such social support to participants through the intervention program's website.

While the researcher did find that the participants seemed to appreciate the individualized support offered them through direct communication on the website, that experience did not translate into a significant statistical change in the posttest data. It seems that the additional tools and support provided through the intervention program did not make enough impact on participants in order for them to achieve notable change in their scores on these two variables.

Although there is little comparable research available, the findings of Charness and Gneezy's (2009) study on the effects of financial incentives to exercise on individuals with a sedentary lifestyle also examined behavioral processes of change. The researchers analyzed the effects of a specific form of rewards (behavioral process of change) seen in monetary incentives to attend the gym regularly. Charness and Gneezy (2009) found that this behavioral process led to successful behavior change in a large minority of participants, thus demonstrating that effectively implementing behavioral processes of change can lead to successful behavioral change. The findings of the present study, in contrast, seem to suggest that behavioral change is not guaranteed when new behavioral processes are implemented.

### **Decisional Balance: Behavioral, Normative, and Control Beliefs to Exercise**

The variables of decisional balance in behavioral, normative, and control beliefs were related to the third research question: What effect does the PWI intervention have upon behavioral beliefs, normative beliefs, and control beliefs in decisional balance? The researcher hypothesized that mothers in the PWI intervention group would experience a

greater increase in all three beliefs (behavioral, normative, and control) in decisional balance compared to mothers in the traditional group and individual group. The findings did not support these hypotheses, however. The findings were not significant for behavioral, normative, or control beliefs in decisional balance across all groups.

The fact that the participants did not demonstrate any significant change in their beliefs related to decisional balance by the end of the program is supported by this study's findings related to behavioral and cognitive processes of change. It seems that, within the 6-week period, participants were unable to fully develop or adopt any new processes or beliefs that would lead to successful behavior change in their exercise habits. The findings related to control beliefs, as measured by the Temptation Not to Exercise Questionnaire, are indicative of this trend. Vallance et al. (2010) found that individuals form control beliefs based on the amount of time and effort they invest into exercising, as well as their perceived abilities to perform the exercise. While this researcher anticipated that the 6-week intervention would lead to participants investing more time and effort into exercising, the lack of change in control beliefs suggests that participants did not notably change their investment to exercise as a result of the program. In fact, their investment seems to have largely remained the same throughout the intervention period. The lack of related research on this topic makes it difficult to analyze this study's results in relation to the existing literature.

### **Self-Efficacy Beliefs to Exercise**

The variable of self-efficacy was related to the fourth research question: What effect does the PWI intervention have on self-efficacy beliefs to exercise of the mothers

of dependent children? The researcher hypothesized that mothers in the PWI intervention group would experience a greater increase in self-efficacy beliefs to exercise compared to mothers in the traditional group and individual group. This hypothesis was not supported by the data, however. There was no significant change from pretest to posttest in participants' self-efficacy beliefs across all groups.

This finding is in line with the findings related to the other variables measured in this study. Self-efficacy, or readiness to change, is a person's belief in their ability to achieve a certain goal or objective. Given that self-efficacy is so closely related to intention (Grzywacz & Marks, 2001), it is notable that this study's participants demonstrated a decrease in intention to exercise, but that their self-efficacy remained relatively unchanged. As both Aizen and Fishbein (1975) and Bandura (1977) have demonstrated, self-efficacy—like intention—has a direct influence on behavioral change. Thus, we can associate the lack of change in participants' self-efficacy with the overall lack of results of the intervention program.

Since participants' scores related to self-efficacy and intention in the current study remained low, the fact that participants experienced little to no behavioral change as a result of the intervention supports the previous research of Aizen and Fishbein (1975) and Bandura (1977) regarding the correlation between these variables and behavioral change.

Bandura's (1977) theory of self-efficacy defines self-efficacy as the strength of one's convictions that he or she can successfully execute a behavior required to produce a certain outcome. Efficacy is viewed as a behavior change and is defined as the strength of one's convictions. Strong convictions are likely to affect whether an individual will be able to cope with any type of situation, good or bad. Self-efficacy is the factor that

influences choice of behavioral setting and choices of activities, and ultimately leads to success or failure. It can also affect one's coping efforts once an individual begins to employ self-efficacy.

Bandura (1977) postulated five primary sources of self-efficacy, namely, initiation, persistence, coping behavior, strong convictions, and expectations of self. If we look at the data for the participants from this study, we can interpret that they lacked initiation towards exercise, persistence towards exercise, coping behavior towards exercise, strong convictions towards exercise, and the expectations towards exercise. All of these variables caused the participants' self-efficacy to decrease.

### **Stage of Change Beliefs to Exercise**

The variable of stage of change was related to the fifth research question: What effect does the PWI Intervention have on stage of change beliefs to exercise of the mothers of dependent children? The researcher hypothesized that mothers in the PWI intervention group would experience a greater increase in stage of change beliefs to exercise compared to mothers in the traditional group and individual group. This hypothesis was not supported by the data. No significance was found in the participants' stage of change beliefs to exercise across all groups.

An increase in an individual's stage of change indicates a step towards successful behavioral change. As discussed in previous chapters, different variables including intention to exercise, processes of change, decisional balance, and self-efficacy are all determinants of increased stages of change. Therefore, the lack of significance in the findings related to those variables supports the lack of significance related to the stage of

change beliefs of this study's participants. Previous studies supported the use of cognitive and behavioral interventions to bring about an increase in stages of change (Armstrong & Edwards, 2004; Cramp & Brawley, 2006). However, given this study's inconclusive findings regarding participants' response to such interventions in relation to their stages of change, it does not support previous studies.

### **Auxiliary Analysis**

This study yielded no significant findings. The lack of results may be due in part to the limitations provided below. While not a dependent variable, the overall focus of the study was physical activity. The findings suggest that the intervention did not influence the psychological precursors to physical activity (intention, etc.). Could it be that some level or amount of a demographic variable accounted for physical activity before the intervention (measured as hours of exercise)? If that were the case, then some descriptive characteristic of moms might be more important in determining physical activity than any type of intervention. A number of demographic variables were collected: age, number of children, hours worked per week, and salary. These variables were regressed onto hours of exercise at baseline. The findings are depicted in Tables 20 and 21. Table 20 indicates that the collection of variables did not predict hours of exercise at pretest ( $p = .67$ ). Even though the variables did not significantly predict hours of exercise, it is informative to examine the betas in Table 21. The variable that was closest to significance was age. Older moms were more likely to exercise more hours. The limitations of the study discussed below are more relevant given these findings.

Table 20

*ANOVA on the Amount of Exercise Hours Compared to Demographics*

Type III sum of squares	<i>df</i>	Mean square	<i>F</i>	Sig.
9.319	4	2.330	.593	.670 <sup>a</sup>
117.824	30	3.927		
127.143	34			

*Note.* The dependent variable for this ANOVA was exerhours.

a. Predictors: (Constant), income, hrswork, age, numberchildren

Table 21

*Regression on the Amount of Exercise Hours Compared to Demographics*

Source DV: Exer-hours	Unstandardized		Standardized	<i>t</i>	Sig.
	B	Std. error	Beta		
(Constant)	.379	1.454		.260	.796
Age	.047	.041	.223	1.149	.260
Nochildren	-.123	.258	-.093	-.478	.636
Hrs-work	.011	.019	.111	.582	.565
Income	-.006	.021	-.051	-.265	.793

*Note.* The dependent variable was exerhours.



### **Limitations**

This study had three main limitations, which are discussed below.

- **Sample size:** Although the response rate was very high, the study sample was limited. The primary investigator decided to accept only participants who scored in the first three stages of change on the Stage of Change Questionnaire pretest. As a result, the sample size dropped substantially after the participants took the pretest.
- **Group assignments:** When the primary investigator was randomly assigning the participants, she called each person in the group to let them know what group they were assigned. She found that there were 3 participants in the traditional group who did not belong to a fitness center and had no contact with any aerobics instructors. Upon discovering this, the primary investigator had to reassign those 3 participants to a new group. Despite this adjustment, the primary investigator tried to find the best balance possible between the three groups.
- **Time of year:** Throughout the duration of the study, most of the participants' children were out of school on summer vacation. This caused various problems for several of the mothers who were struggling to juggle the children and find time to exercise. Furthermore, some participants' family vacations were planned months in advance and conflicted with the timing of the study.

### **Directions for Future Research**

Having noted the limitations within the current study, several recommendations can be made for future research exploring similar relationships examined in this study. Due to the potential relationships found in this study but the lack of significance of the data, future research should focus on a more simplified model.

The first recommendation is to combine the two mediators into a single mediator to increase the need to exercise, such as incorporating the intention to exercise and the temptation not to exercise. Another strategy would be to only incorporate one of the four mediators into the study. The chosen mediator for the focus of research could be either increasing decisional balance towards exercise, lowering temptation not to exercise, increasing self-efficacy towards exercise, or increasing intention towards exercise.

A second recommendation for future research in this area is to perform a mixed methods study that combines quantitative and qualitative approaches. While some quantitative measurements would be used to ensure scale reliability and validity, there would also be an open-ended interview component where the researcher holds one-on-one discussions with each participant, allowing them to share their thoughts and feelings towards exercise. This qualitative component would potentially shed light on why it is a struggle for some mothers with young children to exercise, and why it is not a struggle for others.

A third recommendation is to use pedometers and daily activity charts (holding children, cleaning the house, doing laundry, etc.) as a method to assess nontraditional forms of exercise that mothers may perform that are useful given their limited personal time. With the data from the pedometer and the activity logs, the researcher could

calculate the number of steps they take each day and the amount of calories they burn. The results may help answer questions regarding why mothers with young children are too tired to exercise, and they may also help demonstrate that this population has too many time constraints in their daily lives.

A fourth recommendation would be to perform a comparison study with mothers with young children who exercise regularly and mothers with young children who do not exercise regularly. This study might take into account the following variables: age of children, attitudes, amount of time spent working, and average hours of sleep per night. It could be a similarly-designed study to the current study and include measurements for intention, self-efficacy, and temptation not to exercise.

### **Conclusion**

The main issue that can be identified in these findings is that there was no noticeable change in the participants across both groups for the majority of the variables measured in the study. Intention to exercise was the only variable for which a change was recorded. However, that change did not support the hypothesis; participants' intention to exercise decreased instead of increasing. For the majority of the data sets, in contrast, there was simply no significant change recorded. Unfortunately, it is difficult to come to any insightful conclusions by comparing these findings to extant studies given the scarcity of research on this topic. The conclusions that can be drawn are primarily related to the population being studied.

As discussed in earlier chapters, mothers of young children are a very difficult population to work with, as it is extremely hard to get them to commit to exercise given

the many competing interests and obligations they have on their time (Armstrong & Edwards, 2004; Brown et al., 2001). In fact, Verhoef and Love (1994) identified a lack of time as the main dividing factor between women with children and women without children. Although all participants in the study expressed an interest in improving their exercise habits, that interest did not necessarily translate into full commitment to the intervention program. The majority of participants maintained low levels of self-efficacy throughout the study and they also demonstrated decreasing levels of intention to exercise; the researcher interprets these scores as being directly related to the mothers' commitment to and preoccupation with their children. As such, participants' self-efficacy and intention related to anything other than their children or their family was likely to be lower, simply because of their lifestyle.

The timing of this study must also be considered when discussing the lack of significance in this study's findings. The 6-week intervention was run in the northeast region during the spring and summer seasons—the only seasons when outdoor activities are possible due to weather constraints throughout the rest of the year. The intervention program was designed as an indoors, stay-at-home program for the ease of the participants, but the researcher found that many participants preferred exercising outdoors due to the nice weather at that time of the year. Given that many participants completed the program during the summer months, their children were out of school and they thus posed an even larger constraint on their time than would have been the case if the study were conducted during the school year. Without their children in school during part of the day, it was often even more difficult for the mothers to find the time to complete the exercise program.

In summary, mothers of young children in the PWI program, the traditional exercise programs, and the individual programs did not change their beliefs or behaviors related to exercise over the 6-week trial period with respect to their initial beliefs and behaviors, and in fact decreased their intention to exercise over this time period. The most compelling story told by this data may be that for mothers of young children, even when social support and online feedback is available, beliefs and behaviors related to exercise are difficult to change. While exercise is crucial to women's physical and mental health, it may be that the demands of caring for young children necessitate the rearrangement of priorities; for many women, it may be that protecting, caring for, nurturing, and providing supervision for their young children overshadows other important priorities, such as exercise.

## APPENDIX A

### DEMOGRAPHIC DATA QUESTIONNAIRE

#### **Demographic Data:**

1. Age? \_\_\_\_
2. Number of children? \_\_\_\_
3. Age of children? \_\_\_\_
4. Married or not married? \_\_\_\_
5. Work outside the home? \_\_\_\_
6. Work inside the home? \_\_\_\_
7. How many hours of work are performed each week in or out of the home for your job? (10 hours and above) \_\_\_\_
8. How many hours a week would you say you exercise? \_\_\_\_\_
9. How much household's income? (circle your answer)
  - A) Less than \$20,000
  - B) More than \$20,000
  - C) More than \$30,000
  - D) More than \$40,000
  - E) More than \$50,000

APPENDIX B

DECISIONAL BALANCE QUESTIONNAIRE

Decisional Balance looks at positive and negative aspects of exercise with respect to your decision to exercise or not to exercise during your leisure time. Please read the following items and indicate how important each statement is with respect to your decision to exercise or not exercise. Use the following 5-point scale to rate each item:

1	2	3	4	5
Extremely Important	Quite Important	Somewhat Important	A Little Bit Important	Not Important

\*\*Please note, if you disagree with a statement and are unsure how to answer, the statement is probably not important to you.

1. I would have more energy for my family and friends if I exercised regularly. \_\_\_\_\_
2. I would feel embarrassed if people saw me exercising. \_\_\_\_\_
3. I would feel less stressed if I exercised regularly. \_\_\_\_\_
4. Exercise prevents me from spending time with my friends. \_\_\_\_\_
5. Exercising puts me in a better mood for the rest of the day. \_\_\_\_\_
6. I feel uncomfortable or embarrassed in exercise clothes. \_\_\_\_\_
7. I would feel more comfortable with my body if exercised regularly. \_\_\_\_\_
8. There is too much I would have to learn to exercise. \_\_\_\_\_
9. Regular exercise would help me have a more positive outlook on life. \_\_\_\_\_
10. Exercise puts an extra burden on my significant other. \_\_\_\_\_

Adapted from "Structure of Decisional Balance for Exercise Adoption," by C. R. Nigg, J. S. Rossi, G. J. Norman, and S. V. Benisovich, 1998, *Annals of Behavioral Medicine*, 20, p. S211. Copyright 1998 by the Society of Behavioral Medicine.

## APPENDIX C

### STAGES OF CHANGE SHORT FORM

To begin with, please read carefully the following definition of regular exercise:

Regular Exercise is any planned physical activity such as brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc., performed to increase physical fitness. Such activity should be performed three to five times per week for 20 – 60 minutes per session. Exercise does not have to be painful to be effective but should be done at a level that increases your breathing rate and causes you to break a sweat.

According to the above definition, do you engage in regular exercise? (Please circle the answer that best describes you)

- Yes, I have been exercising regularly for MORE than 6 months.
- Yes, I have been exercising regularly for LESS than 6 months.
- No, but I intend to exercise regularly in the next 30 days.
- No, but I intend to exercise regularly in the next 6 months.
- No, and I do NOT intend to exercise regularly in the next 6 months.

Adapted from “A Missing Piece of the Transtheoretical Model Applied to Exercise: Development and Validation of the Temptation to Not Exercise Scale,” by H. A. Hausenblas, C. R. Nigg, E. A. Dannecker, D. S. Downs, R. E. Gardner, E. A. Fallon, ... and M. G. Loving, 2001, *Psychology and Health*, 16, pp. 381–390. Copyright 2001 by Routledge; “Self-Efficacy and the Stages of Exercise Behavior Change,” by B. H. Marcus, V. C. Selby, R. S. Niaura, and J. S. Rossi, 1992, *Research Quarterly for Exercise and Sport*, 63, pp. 60–66. Copyright 1992 by Taylor & Francis; “Structure of Decisional Balance for Exercise Adoption,” by C. R. Nigg, J. S. Rossi, G. J. Norman, and S. V. Benisovich, 1998, *Annals of Behavioral Medicine*, 20, p. S211. Copyright 1998 by the Society of Behavioral Medicine.



## APPENDIX D

### TEMPTATION NOT TO EXERCISE QUESTIONNAIRE

Using the scale below, please indicate how TEMPTED you are NOT to exercise in the following situations:

0%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, or 100%

With 0 % being Not Tempted at All, 50 % being Somewhat Tempted and 100% being Extremely Tempted. (For example, if you feel extremely tempted to not exercise when you are stressed, you would write in 0%.)

1. \_\_\_\_\_% When I am angry.
2. \_\_\_\_\_% When I feel lazy.
3. \_\_\_\_\_% When I feel satisfied.
4. \_\_\_\_\_% When I feel that I don't have the time.
5. \_\_\_\_\_% When I am alone.
6. \_\_\_\_\_% When family events/situations interfere.
7. \_\_\_\_\_% When I am stressed.
8. \_\_\_\_\_% When I am busy.
9. \_\_\_\_\_% When I am out of shape.
10. \_\_\_\_\_% When I have work to do.

Adapted from "A Missing Piece of the Transtheoretical Model Applied to Exercise: Development and Validation of the Temptation to Not Exercise Scale," by H. A. Hausenblas, C. R. Nigg, E. A. Dannecker, D. S. Downs, R. E. Gardner, E. A. Fallon, ... and M. G. Loving, 2001, *Psychology and Health*, 16, pp. 381–390. Copyright 2001 by Routledge; "Self-Efficacy and the Stages of Exercise Behavior Change," by B. H. Marcus, V. C. Selby, R. S. Niaura, and J. S. Rossi, 1992, *Research Quarterly for Exercise and Sport*, 63, pp. 60–66. Copyright 1992 by Taylor & Francis.

## APPENDIX E

### READINESS TO CHANGE QUESTIONNAIRE

The following experiences can affect the exercise habits of some people. Think of similar experiences you may be currently having or have had **during the past month**. Then, using the following five-point scale, enter in the box how frequently the event occurs by using the following scale:

1	2	3	4	5
Never	Seldom	Occasionally	Often	Repeatedly

#### Consciousness Raising

1. I read articles about exercise in an attempt to learn more about it.
2. I look for information related to exercise.
3. I find out about new methods of exercising.

#### Dramatic Relief

1. I get upset when I see people who would benefit from exercise but choose not to exercise.
2. I am afraid of the consequences to my health if I do not exercise.
3. I get upset when I realize that people I love would have better health if they exercised.

#### Environmental Reevaluation

1. I realize that if I don't exercise regularly, I may get ill and be a burden to others. I think that my exercising regularly will prevent me from being a burden to the healthcare system.

2. I think that regular exercise plays a role in reducing health care costs.

#### Self-Reevaluation

1. I feel more confident when I exercise regularly.

2. I believe that regular exercise will make me a healthier, happier person.

3. I feel better about myself when I exercise.

#### Social Liberation

1. I have noticed that many people know that exercise is good for them.

2. I am aware of more and more people who are making exercise a part of their lives.

3. I have noticed that famous people often advertise the fact that they exercise regularly.

#### Counterconditioning

1. When I feel tired, I make myself exercise anyway because I know I will feel better afterwards.

2. Instead of taking a nap after work, I exercise.

3. Instead of relaxing by watching TV or eating, I take a walk or exercise.

#### Helping Relationships

1. I have a friend who encourages me to exercise when I don't feel up to it. I have someone who encourages me to exercise.

2. My friends encourage me to exercise.

#### Reinforcement Management

1. One of the rewards of regular exercise is that it improves my mood.

2. I try to think of exercise as a time to clear my mind as well as a workout for my body.

3. If I engage in regular exercise, I find that I get benefit of having more energy.

#### Self Liberation

1. I tell myself that I can keep exercising if I try hard enough.

2. I make commitments to exercise.
3. I believe that I can exercise regularly.

Stimulus Control

1. I keep a set of exercise clothes conveniently located so I can exercise whenever I get the time.
2. I use my calendar to schedule my exercise time.
3. I make sure I always have a clean set of exercise clothes.

Adapted from *Processes of exercise behavior change: Redeveloping the scale*, by C. R. Nigg, J. S. Rossi, G. J. Norman, and S. V. Benisovich, 1999. Poster presented at SBM, San Diego, CA.

## APPENDIX F

### SELF-EFFICACY QUESTIONNAIRE

This questionnaire looks at how confident you are to exercise when other things get in the way. Read the following items and enter in the box the number that best expresses how each item relates to you in your leisure time.

1	2	3	4	5
Not at all confident	Somewhat confident	Moderately confident	Very Confident	Completely Confident

#### Negative Affect

1. I am under a lot of stress.
2. I am depressed
3. I am anxious

#### Excuse Making

1. I feel I don't have the time.
2. I don't feel like it.
3. I am busy.

#### Must Exercise Alone

1. I am alone.
2. I have to exercise alone
3. My exercise partner decides not to exercise that day.

## Inconvenient to Exercise

1. I don't have access to exercise equipment.
2. I am traveling.
3. My gym is closed

## Resistance from Others

1. My friends don't want me to exercise.
2. My significant other does not want me to exercise.
3. I am spending time with friends or family who do not exercise.

## Bad Weather

1. It is raining or snowing.
2. It's cold outside.
3. The roads or sidewalks are snowy.

Adapted from "Self-Efficacy and the Stages of Exercise Behavior Change," by B. H. Marcus, V. C. Selby, R. S. Niaura, and J. S. Rossi, 1992, *Research Quarterly for Exercise and Sport*, 63, pp. 60–66. Copyright 1992 by Taylor & Francis; "Structure of Decisional Balance for Exercise Adoption," by C. R. Nigg, J. S. Rossi, G. J. Norman, and S. V. Benisovich, 1998, *Annals of Behavioral Medicine*, 20, p. S211. Copyright 1998 by the Society of Behavioral Medicine.

## APPENDIX G

### SUBJECTIVE NORMS QUESTIONNAIRE

Subjective Norms looks at the social support received with respect to your decision to exercise or not to exercise in your leisure time using a Likert-type Scale.

Use the scale below to answer the following questions:

1 (Strongly Disagree)

2 (Somewhat Disagree)

3 (Moderately Disagree)

4 (Neutral)

5 (Moderately Agree)

6 (Somewhat Agree)

7 (Strongly Agree)

1.	Most people who are important to me think I should participate in regular physical exercise.	
2.	Most people who are important to me encourage me to participate in regular physical exercise.	
3.	Most people who are important to me support me in participating in regular physical exercise.	

Adapted from *Understanding Attitudes and Predicting Social Behavior*, by I. Ajzen and M. Fishbein, 1980. Copyright 1980 by Prentice-Hall; "Understanding Exercise Motivation in Colorectal Cancer Patients: A Prospective Study Using the Theory of Planned Behavior," by K. S. Courneya, C. M. Friedenreich, K. Arthur, and T. M. Bobick, 1999, *Rehabilitation Psychology*, 44, pp. 68–84. Copyright 1999 by the American Psychological Association.

## APPENDIX H

### INTENTION QUESTIONNAIRE

This questionnaire looks at your intention to exercise. Please read the following definition of regular exercise and then mark in the box the number that best expresses your level of intention in regards to the corresponding statement.

Regular Exercise is any planned physical activity such as brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc., performed to increase physical fitness. Such activity should be performed three to five times per week for 20 – 60 minutes per session. Exercise does not have to be painful to be effective but should be done at a level that increases your breathing rate and causes you to break a sweat.

1	2	3	4	5		
Strongly Disagree	Somewhat Disagree	Moderately Disagree	Neutral	Moderately Agree	Somewhat Agree	Strongly Agree

1. My goal is to participate in physical exercise at least 3 times per week every week
2. I intend to participate in physical exercise as much as I can every week
3. Please fill in the blank in the following statement:  
I plan to participate in physical exercise at least \_\_\_\_\_ times per week every week.

Adapted from “Cognitive Mediators of the Social Influence-Exercise Adherence Relationship: A Test of the Theory of Planned Behavior,” by K. S. Courneya and E. McAuley, 1995, *Journal of Behavioral Medicine*, 18, pp. 499–515. Copyright 1995 by Springer; “Predicting Repeated Behavior From Intention: The Issue of Scale Correspondence,” by K. S. Courneya, 1994, *Journal of Applied Social Psychology*, 24(7), pp. 580–594. Copyright 1994 by Wiley Periodicals.



APPENDIX I

CONSENT WAIVER

Please complete the following information and then carefully read and sign the consent form at the bottom of this page. Please remember to write as legibly as possible.

**Personal Information**

_____	_____
Full Name	Age
_____	_____
Mailing Address	Home
_____	_____
City, State, Zip	Work Phone
_____	_____
Email Address	Cell Phone

**Family Information**

_____	_____
Child's Name	Age
_____	_____
Child's Name	Age
_____	_____
Child's Name	Age

I \_\_\_\_\_ give my permission to have my own and my children's picture taken as part of the research project conducted by Tammy Boyd Bradley PhD (ABD), student at University of Utah in the Exercise Sports Science Program.

_____	_____
Signature (or signature of parent or guardian if under the age of 18)	Date

APPENDIX J

EXERCISE LOG

**Week One:**

Date	Time	Type of Exercise	Feelings While Exercising
Additional Thoughts or Feelings:			

## APPENDIX K

### WEBSITE

http://powerwithin.nsytes.com



Figure 6. Image of Power With-in website.

## APPENDIX L

### CONSENT DOCUMENT

#### **BACKGROUND**

You are being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives if you wish. Ask the researcher if there is anything that is not clear or if you would like more information. Take time to decide whether or not to volunteer to take part in this research study.

The purpose of this study is to examine how different kinds of exercise (on one's own, as part of a class, or with additional coaching and other resources) are related to exercise attitudes and behavior among mothers with children 17 or younger. Interested participants will be randomly assigned to one of three exercising groups and asked to complete five questionnaires and keep daily exercise logs for a period of 6-weeks. As these participants change their behavior with respect to exercise, intention to exercise may increase. If intention to exercise increases, the participant may see advantages of exercise, may receive greater social support, may recognize a decrease in temptation to not exercise, and might see an increase in self-confidence. This may be accomplished through the use of an intervention program entitled The Power With-In. The Power With-In program utilizes three methods to try to bring about this improvement in health behaviors. They include a personalized exercise DVD, a web-site, and life coaching. This study is designed to validate an integrated model of behavior change and to fill in the gaps and expand upon previous research by evaluating the effects of a stage-targeted intervention on a mother's intention to exercise.

This study is being conducted by Tammy Bradley, a PhD student in Sports Psychology at the University of Utah. Barry Shultz, Ph.D., Department Chair of Exercise and Sport Science at the University of Utah, is the faculty sponsor.

#### **STUDY PROCEDURE**

##### Participation

Each participant will have an introductory meeting with Tammy Bradley, the researcher

either in person, email, webcam or by telephone. There are multiple cities and states due to connections that Tammy Bradley has in these places which help's with recruiting participants. However, given that a lot of factors influence participation in exercise programs, the fact that participants are spread across the country will help with being able to generalize the results of the study and present a wider sample of participants as a benefit. The study's intent is to provide all coaching through the Power With-In website and phone number if needed of primary investigator. The website is set-up specifically for the intervention and conducted privately. Participants will have their own access code that only the primary investigator has access to. All participants will be randomly assigned to the intervention group or one of two control groups. This randomization will be accomplished by using a lottery method.

There are five Pre (before the study) and Post (after the study) Test Questionnaires that will be expected to be done for this six week study and 6-month follow-up questionnaire to be complete by participant the time to take these questionnaires is approximately 20 minutes. No participant in the study is required to complete any question on the questionnaire packet that makes her feel uncomfortable. There will be a 6-month follow-up questionnaire to be completed by the participant. Depending on the state you live in questionnaires will be completed either; in the presence of the principal investigator, mailed to you along with a stamp return addressed envelope or completed on the internet.

Responses on the questionnaires are confidential. The investigator will keep the key that links the ID# to the names in a locked cabinet and on her computer that only she has access too. The researcher will ask you whether or not you are or plan on becoming pregnant during this 6-week study if your answer is yes you will not be allowed to participate in this study and must let the researcher know. You will be asked to complete a questionnaire packet to measure your beliefs and behaviors regarding exercise. This packet should take approximately 20 minutes to complete. You will be asked to participate in a 6-week exercise program, and be expected to keep daily exercise logs for the 6-weeks of the study (this is a very important part of the study). All Participants are to keep daily exercise logs, the logs will be provided by hardcopy or through attachments through the internet. Exercise logs are to be filled out for each day the participant exercises and either mailed to Tammy Bradley's at the end of each week, for 6 weeks or emailed. The exercise log includes a place to record the date, time (how long you exercised) and type of exercise for that day. You will be assigned to one of three groups. The first group will be a exercise class setting with an instructor to lead exercise program of your choosing, a second group will be a self-directed exercise program (you choose the type of exercise you want to do on your own from a list of approved exercises), and the third group will be a program called the Power With-in. This program uses DVD's, an educational website, and a life coach to design and implement an exercise program specifically to meet your exercise needs.

Copies of the survey are available by request if you wish to view them. Please contact Tammy Bradley at [tammybradley2000@yahoo.com](mailto:tammybradley2000@yahoo.com) for more information.

## **RISKS**

There are no expected difficulties or risks associated with involvement in the completion of the short questionnaire packet or any portion of this study. If psychological distress is perceived following the completion of this packet, resources are available at the University of Utah Women's Resource Center (801.581.8030) or the University of Utah Counseling Center (801.581.6826). Exercise programs can result in shortness of breath, mild muscle and joint pain, strains and sprains of ligaments, tendons, and muscles and in rare cases severe orthopedic and cardiovascular injuries or problems.

## **BENEFITS**

You may see health benefits from this study include increased energy, self-confidence, and a change in behavioral beliefs towards exercise. "We cannot guarantee any direct benefits to you from your participation in this study. We hope the information we learn will help others in the future."

## **CONFIDENTIALITY**

You will be asked to provide personal information for this study, including your name, age, phone number, and income. This information will impact the results of the study. All gathered information pertaining to you will be in strict confidence. Your name will be assigned a number, which only Tammy Bradley will know about. Any information collected will be put in a locked up file cabinet in her office that only Tammy Bradley will have privilege too. The investigator will keep the key that links the ID# to the names in a locked cabinet and on her computer that only she has access too. After you complete your survey, you will turn it in to the primary investigator Tammy Bradley. Your information will be kept confidential, and will not be shared with any other person. All personal information will be stored in Tammy Bradley's home office locked in a filing cabinet, and in a password-protected computer, only Tammy Bradley will have access.

Results of this study may be published, but your identity will not appear in any such publication.

## **PERSON TO CONTACT**

"If you have questions, complaints or concerns about this study, or if you think you may have been harmed from being in this study, you can contact Tammy Bradley at 704-799-0533. Tammy Bradley can be reached at this number between 9:00AM-4:00PM if it is an emergency call anytime needed."

**Institutional Review Board:** Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at [irb@hsc.utah.edu](mailto:irb@hsc.utah.edu).

**Research Participant Advocate:** You may also contact the Research Participant

Advocate (RPA) by phone at (801) 581-3803 or by email at [participant.advocate@hsc.utah.edu](mailto:participant.advocate@hsc.utah.edu).

### **RESEARCH-RELATED INJURY**

The University of Utah is a part of the government. If you are injured in this study, and want to sue the University or the doctors, nurses, students, or other people who work for the University, special laws may apply. The Utah Governmental Immunity Act is a law that controls when a person needs to bring a claim against the government, and limits the amount of money a person may recover. See Section 63-30d-101 through 63-30d-904 of the Utah Code.

### **VOLUNTARY PARTICIPATION**

It is up to you to decide whether or not to take part in this study. If you decide to take part, you are still free to withdraw at any time and without giving a reason. Refusal to participate or the decision to withdraw from this study will involve no penalty or loss of benefits to which you are otherwise entitled.

### **COSTS AND COMPENSATION TO PARTICIPANTS**

There are no costs to you for participating in this study. Once the study is completed and the primary investigator find's that the intervention was more beneficial in terms of getting the participants to remain physically active then the intervention program will be offered to the participants in the two control groups. There will be a waitlist for those who want to take part in the intervention but were put into the two control groups. These participants will be given the option to receive the intervention which includes a personalized DVD, access to the website, and life coaching. **Please Note:** The intervention will **only** be offered when the study is completed, data has been collected, data shows that the intervention was more beneficial in terms of getting the participants to remain physically active and the final writing of the dissertation is done.

### **CONSENT**

By signing this consent form, I confirm I have read the information in this consent form and have had the opportunity to ask questions. I will be given a signed copy of this consent form. I voluntarily agree to take part in this study.

---

Printed Name of Participant

---

Signature of Participant

---

Date

Printed Name of Researcher or Staff

---

Signature of Researcher or Staff

---

Date



APPENDIX M

ADVERTISEMENT FOR STUDY

**NEEDED**

**Looking for Exercise Participants for a Study from the  
University of Utah**

Currently working on a dissertation studying exercise challenges and benefits for Mothers of young children who are actively involved in weekly / monthly exercise programs.

Seeking volunteer participants for a 6-week study.

Participants will be expected to answer on-line exercise related questionnaires, and log exercise activities each week.

Participants will receive coaching and recommendations on exercise practices, nutrition, weight loss, and body image.

For more information call: Tammy Bradley xxx-xxx-xxxx

## APPENDIX N

### LETTER REGARDING STUDY

To Whom It May Concern:

My name is Tammy Bradley and I am a PhD candidate from the University of Utah. I am conducting a study for my dissertation regarding exercise challenges and benefits for mothers of young children. I would like to recruit women from your facility that would be interested in participating in this study. The participants would need to be mothers of young children (children under the age of 18), and would need to be attending one of your exercise classes in order to participate.

There would be no involvement from your institution pertaining to my study. These women would fill out a pre and post study set of questionnaires and commit to being in the study for 6-weeks and must be attending one of your activity classes on a regular bases.

Please let me know if I can stop by for a brief meeting to discuss this opportunity further, and to answer any of your questions.

Sincerely,

Tammy Bradley PhD (ABD)

Home: xxx-xxx-xxxx

Cell: xxx-xxx-xxxx

## APPENDIX O

### NEWSPAPER ADVERTISEMENT

Exercise Participants Needed for a Study from the University of Utah

Currently working on a dissertation studying exercise challenges and benefits for Mothers of young children who are actively involved in weekly / monthly exercise programs.

Seeking volunteer participants for a 6-week study.

Participants will be expected to answer on-line exercise related questionnaires, and log exercise activities each week.

Participants will receive coaching and recommendations on exercise practices, nutrition, weight loss, and body image.

For more information call: Tammy Bradley xxx-xxx-xxxx

## APPENDIX P

### POWER WITH-IN WEB SITE HANDOUT

"Power With-In" is a way to empower someone interested in a personalize exercise program, motivational "Life Coach", and or a personal trainer. Power With-In is designed specifically for the individual who wants to change exercise habits, eating habits and negative thinking habits about self.

#### **Directions to us the PWI Web Site:**

Step 1: [www.powerwith-in.com](http://www.powerwith-in.com)

Step 2: Click: Client

Login

Step 3: User name: participants name

Step 4: Password: Created by user only

Step 5: Click: Log on

Step 6: Click: Forum

Step 7: Click: General

Step 8: Click: Exercise log

Step 9: Chick: Journaling; Write thoughts on work-out for that day, ask any questions and will receive answers with-in that day of asking.

Step 10: Chick: News Letters

Step 11: Chick: Rate How You Feel Towards Exercising Today!

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Disagree	Strongly Disagree
	1	2	3	4	5
I enjoyed exercising today.					
It was stressful to exercise today.					
I was tempted to not exercise today.					
I looked forward to exercising today.					
Exercising is becoming easier to do.					

## APPENDIX Q

### STUDY INSTRUCTIONS

The exercise program for the 6 weeks will be as follows:

1st Stage: 20 minute workouts for 2 weeks (Precontemplation Stage)

3 minute warm-up

10 minute cardio

3 minute toning

3 minute cool-down

2st Stage: 30 minute workouts for 2 weeks (Preparation Stage)

3 minute warm-up

17 minute cardio

5 minute toning

5 minute cool-down

2st Stage: 40 minute workouts for 2 weeks (Action Stage)

3 minute warm-up

25 minute cardio

7 minute toning

5 minute cool-down

### Stage Three: week 5 & 6

#### Cardio Exercise 35 to 45 minutes:

You are at the point that if you feel good enough you can jog. But the most important thing I would like you to do is just be consistent. Don't kill yourself! You do not have to add more time if you do not want too you can even take time off all I want you to do is continue to exercise.

Instructions: Time yourself doing 3 minutes of slow walking and 3 minutes of fast walking or you can do power walking mix in some light jogging. Switching from power walking to light jogging. Or you can do only power walking or only jogging. (You do not want to push yourself to hard, if you feel any pain stop and walk slow)

#### Toning: (optional) 10-20 minutes

##### Stomach Crunches: 3 sets 10 to 20 (rest between each set)



##### The Reverse Crunch: 3 sets 10 to 20 (rest between each set)



Lie on your back on the floor with your hands behind your head or on the floor by your hips, with your knees bent and your feet lifted six inches above the ground.

Slowly bring your knees toward your chest and lift your butt off the ground. Concentrate on contracting your abs, you should feel your lower abs working after a few repetitions.

Use your abs do not swing your legs to create momentum. Slowly lower your legs to the

starting position, six inches of the floor.

Breathe out on the way up, in on the way down. Rest a few minutes and do another set.

The Oblique Crunch: 3 sets 10 to 20 (rest between each set) both sides



Lie on your back, knees bent, so your left foot is resting flat on the floor. With your right knee bent, place your right foot across your left knee.

Place your left hand at the side of your head and your right hand on the left side of your abdominals or on the floor next to your thigh.

Curl your body up with a twisting movement, bringing your left shoulder toward your right knee. Slowly lower your body to the ground.

Breathe out on the way up, in on the way down. Rest a few minutes and do another set.

Don't forget to do the same for the other side as well.

Bonus: The Bicycle Exercise: 3 sets 10 to 20 (rest between each set)



This is a simple and very effective exercise that works all three areas of your stomach simultaneously.

Lie on your back on the floor with your hands behind your head. Slightly bend your knees and bring them in towards the chest and lift the shoulder blades off the ground.

Straighten the left leg out to about a 45-degree angle while simultaneously turning the upper body to the right, bringing the left elbow towards the right knee.

Switch sides, bringing the right elbow towards the left knee. Continue alternating sides in a 'pedaling' motion for 15-30 reps. Rest a few minutes and do another set. Try to do 3-4 sets.

## 2. Back Standing Rows 3 sets 10 to 20 (rest between each set)

- These are done from a standing position.
- Loop a towel around a vertical pole or column or another fixed object so that the ends of the towel are pointing towards you and the towel is wrapped around the far side of the pole.
- Have your feet close up to the pole and lean back gripping on the ends of the towel and keeping your body stiff and straight.
- Row yourself up with both arms.
- Keep your back arched and row with your back.



## 3. Shoulders Seated Dumbbell Shoulder Presses: Standing Rows 3 sets 10 to 20 (rest between each set)

- Use something around the house for weight, e.g. soup cans or milk jugs with water in them.
- From a seated or standing position, hold the weights just above your shoulders.
- Push them up overhead slowly.



## 4. Legs Bodyweight Squats 3 sets 10 to 20 (rest between each set)

Place your feet about shoulder width apart.

- Keeping your torso vertical and a slight arch in your lower back, start the movement by bending the knees.
- Go only as far down as you feel comfortable when first starting out. If you can go down until your thighs are just below parallel, do so. This is the full range goal.
- Using leg power, push yourself back up to the start position. Use your grip on the bar only for balance unless you absolutely need to pull yourself up.





Note:

As you get stronger with squats, don't use the bar anymore. When you can do good, full-range reps without the bar, you can start using weight.

For weight, use two duffel bags (evenly loaded) or two milk jugs, etc. Hold them at your sides and squat.

## APPENDIX R

### MESSAGE TO PWI GROUP

#### Message to PWI Group: 3-5-2012

It is my belief that when a person learns to accept self, to understand who they are, why they are special and unique, to love their body, they start to become one with self by accepting who they are. My approach is through Mind-Body-and-Spirit. Mind is on getting rid of the negativity in our minds and replacing it with positive affirmations. Body is accepting the body you have, understanding its differences and loving it. Spirit is learning that you are not alone and that there is something greater and bigger, a higher power, God, Mother Earth. A place where you can get strength, hope, and faith or find someone that you trust that cares about you and accepts you. This is done through meditation, writing, and relaxation exercises. I have learned developing a positive self-image can be done through service for others. Service helps a person become less self-centered and more concerned for the others.

## APPENDIX S

### REQUEST FOR PARTICIPANTS

From: Tammy Bradley [[tammybradley2000@yahoo.com](mailto:tammybradley2000@yahoo.com)]  
Sent: Saturday, January 02, 2010 9:52 AM  
To: Tammy Bradley  
Subject: Tammy Bradley PhD Study: Request for Participants

Hi Friends,

As some of you may know, I am a doctoral candidate at the University of Utah working on my PhD in Sport Psychology. I am doing a dissertation research project on why women who are mothers are tempted to not exercise. I am looking for female participants to be in this project which is designed to collect data from a specific sub-group of women with children.

These women are from the ages of 21 to 50, and are mothers of children from infancy to 17 years of age. This is an exercise study that will last for 6 weeks. There will be pre-study and post-study questionnaires to complete on attitudes towards exercise. In addition, participants will be asked to exercise 3-5 times per week and will be asked to log exercise information about the time and duration of their exercise routine(s).

The participants will be randomly assigned one of three groups:

The first control group will be an exercise class setting with an instructor to lead exercise programs of your choosing. This could include working out at a health club or PE class in an instructor led program.

The second control group will be a self-directed exercise program (you will choose the type of exercise you want to do on your own from a list of approved programs), which may include DVD home workout programs, or other self-motivated programs.

The third group (intervention) will be a program called the Power With-in. This program uses DVD's, an educational website, and a life coach to design and implement an exercise program specifically to meet your exercise needs. I cannot guaranty that you will be in the Power With-in group but no matter which group the participant is in, everyone will receive a personalized exercise DVD once the data is collected and the study is finished.

I need participants who will be willing to begin the project in mid-January 2010 by completing the pre-study questionnaire. The 6-week exercise phase will begin in February 2010.

If you are interested in participating in this study or if you know of anyone that would like to be a part of this important study, please respond to me at my yahoo address:

[tammybradley2000@yahoo.com](mailto:tammybradley2000@yahoo.com).

When you contact me please include your contact information including name, mailing address, email address, day/evening phone number.

Sincerely,

Tammy Bradley PhD (ABD)

## APPENDIX T

### POST ON PWI WEBSITE

Temptation

June 29, 2010

"Never, never, never give up!"  
~ *Winston Churchill*

This quote by Winston Churchill has been one of my favorites ever since I was young. I would have to say that when I was young, if I was searching for praise it was not going to come from people. It would have to come from with-in me. I say this is because I was told by many people important to me that I would never succeed, due to the fact that I was not a good student and I came from a very dysfunctional family.

At a young age I knew that if I wanted to succeed at something, the journey would be alone. With that in mind I realized that I would have many obstacles in my way. I call these obstacles road blocks or pylons in the road that I needed to find a way to get around or over in order to accomplish the goal. I knew that people would discourage me and tell me to quit. One of these was a high school counselor, Mr. Roonie. He meant well, but when I told him I wanted to go to college and not just any college his response was, "You should become a checker or learn a trade." When I was in my last semester of my senior year he asked, "What have you decided about your future, Tammy?" I told him, "I am going to Ricks College." "You won't make it through the first semester". My mother didn't want me to go to college, either. The leader of my church wanted me to stay home and take care of my mother and sisters. The list goes on and on, but I was determined. So...long story short, I not only graduated but walked on to the gymnastics team too. I am not saying it was easy, because it wasn't. I had to retake certain classes and go to many study groups, but it all paid off. In my first semester, all five of my roommates quit and went back home. I worked and went to school and had no support from family, none. It was hard to stay. I wanted to quit. I had every reason to quit, but I knew what my life would be like if I did. I would think of my life back home, and when I did I saw

unhappiness. When I looked forward I saw hard work and lonely times but also saw that it was worth it at the end.

This lesson and many more like this have stayed with me and been a driving force to withstand temptation.

I believe everyone has a story, something that they have done to overcome the odds and accomplish their goal. We forget those stories, but we need to think of how we crossed the finish line.

These are some things that help me when I feel tempted to quit and give into that temptation.

First, I believe in God and that He along with Jesus Christ has and is with me on my journey. I am a very spiritual person. This has been my life preserver. I believe that we all need something spiritual in our lives, whether it is God, Christ, a Higher Spirit, Buddha, Hindu, the earth itself. By having something to believe in we are then not alone. We feel strength from other than ourselves.

Second, I look for role models to follow and visualize myself like them. I listen very closely, asking questions, and then I try to copy how they do it. I practice this over and over until I know how to do it myself.

Temptation is something always there. But I know that I have the control to overcome anything that is in front of me, from deep within me I would and do find inner-strength to overcome the hurdle that may be in front of me.

Quitting is always an option. It is easy to quit, but to stay with something and constantly find reasons to continue with it is hard.

The definition of temptation: A **temptation** is an act that looks appealing to an individual. It is usually used to describe acts with negative connotations and as such, tends to lead a person to regret such actions, for various reasons: legal, social, psychological (including feeling guilt), health, economic, etc.

We often find ourselves in a situation where we have to choose. Choose to do the best thing for us. When we see something that is overwhelming and hard to do, we look for reasons to avoid it.

Life is too short to look back with regret or feelings of guilt. If you find yourself sliding back into old habits, remember you are human and are someone that is not perfect.

**Aristotle: Temptation Quotes**

I count him braver who overcomes his desires than him who conquers his enemies; for the hardest victory is the victory over self.

**John W. DeForest: Temptation Quotes**

It is not the great temptations that ruin us; it is the little ones.

**Sir Edmund Hillary: Temptation Quotes**

It is not the mountains that we conquer, but ourselves.

**Robert H. Schuller**

It takes but one positive thought when given a chance to survive and thrive to overpower an entire army of negative thoughts.

**Vince Lombardi**

It's not whether you get knocked down; it's whether you get up.

Temptation is a hard one because there are so many reasons to come up with to Not exercise.

So remember..... Never, Never, Never Give Up!

By Tammy Bradley

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