EVALUATING EXERCISE ADHERENCE:
A SOLUTION FOCUSED APPROACH

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Jonathan S. Schneider
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DEDICATION

I would like to extend my appreciation to all of those who gave me the strength to complete this project. I am so thankful for the patience and guidance that Dr. van den Berg provided throughout this endeavor- it was his direction that made this overwhelming task appear manageable. I would like to thank Dr. Cole for introducing one of the major elements within this study- it was her inspiring presentation of course material that ignited the development of this project. I would also like to thank my friends and loved ones who provided me with the incredible support to overcome this challenge. Their words of encouragement will always be remembered.
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ABSTRACT

EVALUATING EXERCISE ADHERENCE:
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Given the generous health benefits that may be attained from consistent exercise, it is essential to explore new methods for encouraging exercise adherence. The purpose of this study is to evaluate the effectiveness of Solution Focused Brief Therapy (SFBT) as an intervention method for exercise. Participants received individualized attention from the researcher as they were placed in a SFBT, Exerciser Checklist, or Control condition. Participants were asked to attend up to four weekly meetings with the researcher, and were encouraged to achieve an exercise goal of five 30-minute sessions a week. Results showed non-significant differences between goal adherence and intervention method. However, trends for increased exercise participation were demonstrated by the SFBT group.
CHAPTER I

INTRODUCTION

It is generally understood that consistent exercise may reward an individual with many health benefits. Exercising may lower a person’s body fat, generate an increase in muscle strength, deliver mental alertness or positive feelings, and may even directly attribute to the longevity of one’s life. So, it may come as a surprise that many are aware of these readily attainable benefits, yet only 35% of adults engaged in leisure time physical activity on a regular basis in 2009 (Sondik, Madans, & Gentleman, 2009). While it may be true, it is rather unlikely that those who choose not to exercise want to be obese, weak, or slow to connect thoughts. Similarly, just because a person feels busy does not mean that he or she feels indifferent about personal health. People desire the benefits of consistent exercise. This means that some sort of obstacle must account for the differences between those who are striving to achieve the payoffs of exercise, and those who simply enjoy the idea of having those payoffs. The purpose of this project is to address the health benefits of exercise, review the literature on strategies for motivating individuals to exercise, and to introduce and compare various intervention methods used to encourage exercise adherence in this study.

Consistent physical exercise is extremely important if good health is to be achieved. The expression, “If you don’t use it, you lose it” really applies, as one’s failure to utilize muscles will result in muscle atrophy. This reduction in muscle mass will lead
to a certain loss of strength. Some may believe that resistance training is unnecessary, for their work profession or leisure activities do not require that they be athletes. However, it is important to not only consider how added exercise may be of benefit, but how a lack of exercise may be harmful. Exercise directly affects the integrity of one’s heart, muscle strength and endurance, and joints. A loss in efficiency for these could mean an increased chance of heart disease, a loss of stamina, or an increased potential for injury. Essentially, physical inactivity can be as much of a health risk as smoking, having a poor diet, or other unhealthy behaviors.

A fitness plan can help control weight. Weight management is important if an individual wants to work towards achieving a specific physical appearance, or if disease prevention is a concern. Stored energy from food intake can be expended through exercise and physical activities, and if an individual expends more energy than he or she consumes that day, then other energy reserves, such as fat, will be used to continue the activity. If fat loss is a goal, then adding in a resistance-training regime can be of benefit. Muscle requires more energy to maintain than fat does, so even when one is not training he or she is burning more calories. Resistance training not only aids with fat loss, but it can generate strength gains over time and create a more toned looking physique.

Generating or maintaining physical strength minimizes the opportunity for injury, where an everyday activity, such as lifting a box of tools, could place strain on the body. Exercise also reduces the risk for health problems, such as heart disease, stroke, type-2 diabetes, obesity, back pain, or osteoporosis. Implementing a physical activity program should be seriously considered in order to avoid future health issues. The following
benefits will be reviewed in greater detail: exercise and the heart; how exercise affects on endurance; exercise and affect; how exercise can induce changes in the brain.

**Exercise and Heart Functioning**

Physical activity is vital for maintaining good heart health. Exercise activities may reduce the risk for developing coronary artery disease (“Physical Activity,” n.d.). Even moderately intense physical exercise performed for 30 minutes a day or longer can help control blood lipid abnormalities, and can reduce blood pressure. The American Heart Association also suggests, from the results of a multiple studies, that those who are able to regulate their behavior and begin to exercise regularly following a heart attack have better rates of survival and a better quality of life. Coronary artery disease, an issue augmented by physical inactivity, is characterized by fatty substance deposits, cholesterol, calcium and other blockages in the inner lining of the arteries that supply blood to the heart muscle. If ignored, coronary artery disease can weaken the heart muscle and lead to heart failure and arrhythmias. Heart failure is a condition where the heart cannot pump enough blood throughout the body, while an arrhythmia can affect the speed or rhythm of the heartbeat (“Heart Failure,” 2010). Over time these conditions may lead to weakness, shortness of breath, a severe cough, fatigue, and swelling of the legs and feet (“Diabetes, Heart Disease, and Stroke,” 2005). A heart attack, which is the most life threatening condition that can result from coronary artery disease, occurs when blood flow to an area of the heart muscle is completely blocked. This blockage restricts oxygen-rich blood from reaching that area of the heart muscle and causes it to die. As the heart muscles are responsible for providing oxygenated blood to all vital areas of the body,
including the brain, muscle failure can lead to serious problems or even death (“Heart Failure,” 2010). So, while intense physical exercise is demanded for a healthy heart, a lack of physical activity will increase the chances that a serious heart condition develops.

**Exercise and Physical Endurance**

Exercise has an incredible effect on one’s endurance. Those who are new to exercise, and patients with chronic lung problems, may have difficulty exercising because they have difficulty breathing. Another struggle is that muscle fatigue soon leaves people feeling exhausted. Exercising does not actually improve lung functioning. However, training can help by strengthening a muscle, which does improve endurance and reduces breathlessness (“Exercise’s Effects on the Lungs,” 2009). People with lung problems such as asthma should consider performing an exercise that helps strengthen the large limb muscles in the arms and legs to help reduce the possibility of breathlessness and improve endurance. Every exercise performed contributes to changes in gene expression for the formation and function of mitochondria, which are organelles found in cells that generate most of cell’s energy supply (Joseph, Pilegaard, Litvintsev, Leick, & Hood, 2006). Exercise encourages an increase in the production of these energy-producing structures, a process called mitochondrial biogenesis, and it allows cells to endure longer periods of energy expenditure without fatiguing (Joseph et al., 2006). Increasing mitochondrial volume in skeletal muscles improves the cells’ ability to perform aerobic respiration, which allows an individual to increase the intensity of an activity or endure an activity for a longer period of time without suffering from fatigue. An increase in exercise activities will allow individuals to better utilize and build their energy sources,
while a lack of activity could leave those feeling exhausted when performing simple everyday tasks.

**Exercise and Mood**

An exercise routine may have a powerful influence on affect. Researches reviewed the findings of numerous studies that compared the effects of exercise on nearly 3,000 patients (Herring, 2010). On average, patients who exercised regularly reported a 20 percent reduction in anxiety symptoms compared to those who did not exercise. Nearly all the studies reviewed demonstrated that those who were assigned to an exercise condition had fewer feelings of worry, apprehension, or nervousness, compared to the participants in the control groups. Exercise sessions that lasted longer than 30 minutes were better at reducing anxiety symptoms than those shorter than 30 minutes, with an effective program lasting between three and twelve weeks. Evidence also suggests that exercise may relieve symptoms of depression. Rot, Mathew, and Charney (2009) shared that, after a 12 week cardiovascular program, exercise was found to be effective in reducing depressive symptoms at a rate that is comparable to antidepressant interventions. A similar effect was found for older adults with major depressive disorder who took part in an anaerobic, resistance training, activity. The resistance training not only helped reduce their symptoms of depression, but improved their subjective sleep quality, quality of life, and muscle strength. Rot and colleagues hypothesize that the positive effects of exercise may be attributed to the neurobiological mechanisms that are augmented following exercise. These neurobiological changes include: elevated levels in endogenous opioids and cannabinoids, which are capable of producing analgesic and
anxiolytic effects; elevated levels of tryptophan, an amino acid precursor of serotonin, to boost brain serotonin function; reduction in stress hormones corticotropin and cortisol for non-exercise conditions; increase of neurotrophin levels. This suggests that exercise can play a large role in altering our neurophysiology and chemistry.

Effects Within the Brain

The brain is rewarded through physical exercise. Exercise can be responsible for a flood of neurotransmitters that affect feelings and mood, and it may also contribute to neuronal growth and regeneration. Huei-Fong et al. (2007) examined the effects of exercise on patients with mitral valve prolapse (MVP), the most prevalent valvular heart disease encountered in clinical cardiology practice, which can cause frustrating symptoms that impair quality of life. To help relieve symptoms, pharmacological treatments such as beta-Adrenergic blockers and benzodiazepine anxiolytics may be prescribed, despite a lack of evidence to support their efficacy (Huei-Fong et al., 2007). In the study beta-endorphins, natural opioid neurotransmitters found in the central nervous system that have pain-relieving effects, were measured prior to and following a 12-week exercise regime. The exercise regime, which required three 30-minute moderate intensity treadmill jogging activities a week over the course of the study, was able to significantly increase beta-endorphin levels and decrease symptoms such as chest pain, arm pain, palpitation, shortness of breath, fatigue, headache, anxiety and emotional upset, and dizziness. These results demonstrate that it does not require a large time investment or great physical demands from the body to alleviate everyday pain symptoms.
Exercise activities contribute to enhance cognitive functioning by nourishing and protecting cell messengers in the brain. Knaepen, Goekint, Heyman, and Meeusen (2010) generated a review that investigated a protein that is responsible for the survival, development, and function of neurons. A temporary increase in the concentration levels of Brain-Derived Neurotrophic Factor (BDNF) following acute exercise were found in 69% of the studies in healthy subjects and 86% of the studies in persons with a chronic disease or disability (Knaepen et al, 2010). BDNF in the central nervous system is responsible for neuronal protection and survival, aiding in the expression or remodeling of axons or dendrites from a cell body, and forming synapses that enhance the opportunity for communication between nerve cells. Having an effect on the hypothalamic pathway that controls bodyweight, energy homeostasis, and through an interaction with leptin, BDNF could mediate health benefits by affecting energy metabolism (Knaepen et al, 2010). BDNF concentration could also be important for the prevention or treatment of neurological diseases or impairments. Exercise is capable of inducing higher levels of BDNF in the hippocampus, an area involved in learning and memory (Vaynman, Zhe, & Gomez-Pinilla, 2004). Properties of BDNF contribute to enhance neuroplasticity, the ability for neurons to strengthen connections between existing nerve cells or generate new connections with other neurons, which is important for strengthening memories or encoding new information. Enhanced cognitive functioning following exercise may be attributed to the effects of BDNF in the hippocampus (Vaynman et al., 2004). Vaynman and colleagues demonstrated the effect of BDNF on learning and memory with rats; those that had increased levels of BDNF
from exercise were significantly faster at re-locating a platform in a Morris water maze, while those whose BDNF action was blocked were significantly slower or less likely to find the platform than the control group. Comparably, Stroth, Hille, Spitzer, and Reinhardt (2009) found that young adults who exercised for 30-minutes, three times a week, over the course of six weeks, improved visuospatial memory performance and had a significant increase in positive affect. So, evidence suggests that consistent exercise can contribute to enhanced cognitive functioning.

What the Evidence Reveals

Exercise has been shown to be beneficial on many levels. It not only leads to a more capable physical self, but contributes to an array of cognitive benefits as well. It can aid in the prevention of debilitating physical ailments, or contribute to the relief of mental anguish. Exercise and its combination with other thoughtful health practices will have an incredible impact on ones quality of life. Unfortunately, many people understand that great benefits can be gained, yet they fail to start or maintain a fitness program. That is why it is important to investigate what troubles non-exercisers face in approaching exercise, and why it is essential to discover methods that encourage people to incorporate exercise into their daily lives.
CHAPTER II

LITERATURE REVIEW

Introduction

Given that exercise can create immediate benefits and aid in preventing future health issues, it is important to understand what potential barriers may be holding back 85% of the population from meeting activity levels prescribed by the American College of Sports Medicine (Dunn, Anderson, & Jakicic, 1998). As everyday events have become more convenient with advances in technology, it is easy to avoid exerting strenuous physical effort for simple chores or tasks. In order to achieve levels of activity that are necessary for good health, people must go out of their way to engage in exercise. Many personal variables including physiological, behavioral, and psychological may affect a person’s intentions to start or maintain an exercise plan.

The Centers for Disease Control and Prevention have collected some of the most common reasons adults cite for not adopting more physically active lifestyles ("Overcoming Barriers to Physical Activity," 2011). Explanations include: not having enough time to exercise; it is inconvenient to exercise; there is a lack of self-motivation; exercise is not found to be enjoyable; exercise is boring; lack confidence in the ability to be physically active (low self-efficacy); there is a fear of being injured or a recent injury has occurred; lack self-management skills; lack encouragement, support, or companionship from family and friends; and there are no parks, sidewalks, bicycle trails,
or safe and enjoyable walking paths convenient to their homes or offices. These reasons address some of the perceived difficulties of exercise, but the overwhelming theme is that exercise is difficult and inconvenient when performed alone. It appears that individuals crave guidance and support, and need something to encourage their exercise habits. Personal qualities that lead to successful exercise behaviors will be reviewed in detail, and effective intervention strategies will also be discussed.

How Goals and Planning Influence Action

To simply desire an outcome is not enough to obtain it—another quality must accompany aspirations to make them attainable. Goal intentions are objectives or desires people want to obtain within a certain time period. Implementation intentions are future plans of action that focus on the steps needed to achieve an outcome. Goal intentions and Implementation intentions represent different mindsets and different proximities to action (Ziegelmann, Luszczynska, Lippke, & Schwarzer, 2007). Implementation intentions may be greater predictors of future achievement because they include a sequence of specified events within certain time parameters (Gollwitzer, 1993). Having a detailed sense of when, where, and how habits will take place reduces the likelihood that a plan will be forgotten. Goals, or simple plans, can introduce action, but evidence has suggested that people who generate detailed behavior plans are more likely to continue an exercise program than those with the same exercise motivations who did not create a plan (Milne, Orbell, & Sheeran, 2002).

Ziegelman and colleagues (2007) investigated the role of goal intentions and implementation intentions (planning) in the prediction of physical exercise on a
group of people who were discharged from orthopedic rehabilitation. They found that both goal intentions and implementation intentions predicted exercise during rehabilitation, however, goal intentions did not predict exercise at later points in time. Implementation intentions did continue to be associated with exercise as late as 12 months later. Ziegelman and colleagues suggested that as behaviors become routinized, less cognitive effort is required to carry out plans. So, as exercise planning leads to mastery of behaviors, failure to plan results in failure to exercise.

Individuals also invest their time in pursuing life goals, which must somehow be concurrently managed along with exercise interests. Jung and Brawley (2010) wanted to explore how more or less frequent exercisers perceived and valued their exercise and non-exercise goals. Questionnaire results suggested that frequent exercisers had significantly higher levels of self-regulatory efficacy to accomplish concurrent, highly valued goals, greater persistence to achieve exercise and non-exercise ambitions, and perceived the pursuit of coexisting goals more positively than less frequent exercisers. Those who believe they are capable of self-regulation tend to do a greater job at making decisions that lead them in the direction they want. The goals people pursue are also influenced by various motives, which command the likelihood of success.

**Two Types of Motivation**

one’s natural or intrinsic tendencies to behave in effective and healthy ways. Wilson and colleagues believe that the quality of motivation regulating exercise behavior is highly important, suggesting that the types of goals exercisers pursue are crucial for impacting one’s motivation to initiate exercise and for maintaining the drive to continue. Examining goal contents within exercise, research indicated that focusing on future intrinsic goal attainment (e.g., health) rather than extrinsic (e.g., attractiveness) goals were associated with sustained exercise behaviors (Vanteenkiste, Simons, Soenens, & Lens, 2004). Goals that are inherently rewarding and that satisfy one’s intrinsic desires were shown to be more effective at prolonging a want for exercise.

Causality Orientations Theory and Potential Influence on Exercise

Integrated within Self-Determination Theory lies a concept that addresses qualities that people have to initiate or regulate behavior. The Causality Orientations Theory (COT) outlines individual differences in personality with respect to how people are orientated toward self-determined or controlled functioning across life domains (Wilson et al., 2008). COT includes three types of causality orientations: the autonomy orientation, where people act out of personal interest and value what they are doing; the control orientation in which the focus is on rewards, gains, and approval; and the impersonal or amotivated orientation that is characterized by anxiety and helplessness towards personal competence (Deci and Ryan, 1985).

Underlying the autonomy orientation is the experience of choice (Rose, Markland, and Parfitt, 2001). Individuals will strive to be self-determining, and will
seek opportunities as sources of information to regulate their own chosen behavior. An autonomously oriented individual will get involved in an activity because the outcome is personally important and valued. Self selected goals and interests drive the direction of behavior, and extrinsic rewards are experienced as evidence of competence rather than the controlling influence of the behavior (Rose et al., 2001). An individual with a predominant autonomous orientation may choose to exercise in a setting that allows choice over structured activities, offers information on competence (such as weight lifted or distance traveled), and allows for personal goal-setting.

Control orientation behaviors are compelled by the perceived sense of pressure that one feels from others, or by the environment (rewards). The sense of self-determination is missing, and behavior is guided by external demands, the avoidance of negative consequences, or pressure imposed by the self. Control oriented individuals rely on controlling influences such as extrinsic rewards and surveillance to motivate them (Rose et al., 2001). A predominantly control oriented individual may choose an exercise environment where a regimen is proposed or controlled by someone else, where there is opportunity for external rewards to be gained (weight loss or increase in muscle size), and where progress is monitored continuously.

Finally, Impersonal orientation follows the sense that behaviors and outcomes are not directly connected. Those with an impersonal orientation feel incapable of directing their behaviors to capture desired outcomes. This loss of control can generate a sense of apathy and can diminish inspiration to participate in events. Understanding how behavior can control an outcome may be unknown to the
individual, which can lead to a sense of personal helplessness and incompetence (Rose et al., 2001). A person with an impersonal orientation may engage in exercise because of external pressures and not because of its values, benefits, or out of enjoyment.

Lewis and Sutton (2011) tested whether the degree of autonomy influences exercise participation. Those with strong autonomy scores were highly correlated with increased exercise participation. Participants who fell into controlled, or externally motivated, and amotivated (impersonal) groups were negatively correlated with exercise participation. The results indicated that those who were more self-focused were more likely to engage in a more frequent exercise plan. Exercise behaviors can by influenced by various motivations, but as people work towards adopting a new behavior there are also changes that they experience as habits are learned and attempted.

The Transtheoretical Model

Specific factors may be able to predict a person’s willingness to engage in exercise behaviors. The Transtheoretical model, represented by several major dimensions, is embodied by the Stages of Change construct. These five stages signify ordered categories along a continuum of motivational readiness to change a problem behavior (Prochaska & DiClemente, 1992). The categories include: Precontemplation, Contemplation, Preparation, Action, and Maintenance. Precontemplation is the stage at which there is no plan to change behavior in the foreseeable future. People in this category are unaware of their problems, or have rationalized that change is not necessary. Contemplation is the stage at which individuals are aware that a problem
exists and are considering implementing change, but they have not yet made the commitment to act. At this point, individuals may enjoy the prospect of overcoming a problem even though they are still unsure of when they plan on starting. The Preparation stage is when people are intending to act in the next month. It may include readiness behaviors such as self-educating and planning (Prochaska, Velicer, Rossi, et al., 1994). Action is the stage in which individuals modify their behavior, mindset, or environment in an effort to make a difference. This requires a substantial commitment of time and energy as individuals introduce major behavioral changes (Velicer, DiClemente, Rossi, & Prochaska, 1990). Maintenance is the final stage in which individuals work to sustain their earned progress and prevent relapse. Factors that could influence the progress through the Stages of Change could include: psychological, environmental, cultural, socioeconomic, physiological, biochemical, or even genetic variables (Prochaska et al., 1994).

Kennet, Worth, and Forbes (2009) provide some empirical evidence for the Transtheoretical Model. They had non-exercisers and physically active individuals complete instruments that assessed learned resourcefulness, stage of change for exercise, self-efficacy, and reasons for exercising. Participants in the Maintenance stage for exercise were on average more resourceful than participants in the Contemplation, Preparation, and Action stages of change. Low resourceful participants in the Contemplation stage of change were the least likely to generate strategies to help facilitate activity. Those in the Maintenance category were more likely to have higher self-efficacy for coping with new conditions and for scheduling their activities. This
evidence suggests that in order to maintain a new behavior it is helpful to have confidence in the ability to adapt to novel situations and be able to plan for incorporating new behaviors in one’s schedule.

How Expectations Influence Outcomes

Confidence is an important factor for creating future change. It can be more powerful than focusing on the rewards that exercise is expected to deliver. Rhodes and Fialia (2009) reviewed factors that influenced exercise adherence across multiple research studies, which followed individuals who were prescribed exercise as a part of their physical rehabilitation program. Future thoughts towards exercise may contribute to its adherence, as attitude towards exercise (overall outcome evaluation), beliefs about the consequences of inactivity, and perceived severity of the outcome were all positively correlated with adherence to exercise following various tendonitis injuries. However, other studies suggest that outcome expectations have little effect on exercise adherence; having knowledge about the benefits of exercise may encourage people to speak positive words towards exercise, but outcome expectations are not strong predictors of adherence (Hammer, Degerfeldt, & Denison, 2007 & Siuijs, Kok, & Van der Zee, 1993). Findings demonstrated strong correlations between self-efficacy and exercise adherence, suggesting that those who feel assured in their ability to follow their exercise plan will be more likely to. Outcome expectations may include desires that are externally motivating, which can influence behaviors towards exercise, but those who display confidence in their abilities and want to demonstrate their competence (internally motivated) are more likely to succeed.
Some of the personal factors that were supported to guide behavior change have been listed. There are apparent distinctions between those who are successful and those who have difficulty at beginning or maintaining exercise behaviors. It appears that personal mindset can contribute towards or hinder a person’s ability to adopt new behaviors. Some of the following methods have been tested to determine their capacity for aiding the development of exercise habits.

**Intervention Methods and Exercise Adherence**

Anshel and Seipel (2009) were interested in understanding the effect of self-monitoring on exercise adherence over an 8-week supervised program. Participants were randomly assigned to one of two groups: a group that completed a self-monitoring exerciser checklist, or a group that did not use the checklist. The exerciser checklist consisted of a 60-item self-monitoring list to serve as a tool in guiding participants to learn effective preparation, performance, and mental skills for engaging in exercise. Both exercise groups received coaching each week to review their performance. The self-monitoring group received instruction from the exercise coach that addressed areas of the checklist that needed additional attention. Results indicated that over the intervention period, the self-monitoring group was not only significantly superior at adhering to exercise training regimens, but greater at improving strength and aerobic fitness levels as well. The findings suggest that sharing effective behavioral strategies for exercise can influence positive exercise outcomes.
Personal trainers also have an influence on exercise behavior. Fischer and Bryant (2008) investigated how certified personal training services affected exercise behaviors using the transtheoretical model of behavioral change. The scale for Exercise Behavior Change was given to participants at the beginning and end of the semester, and it measured the opportunity for being in one of five stages of behavioral change. Each stage of change defines behavior and intentions for exercise, which include: frequency, duration, and plans for starting exercise or whether exercise habits were being maintained. Other measures were prescribed to understand cognitive and behavioral perspectives from the participants. Results indicated that those who did not receive aid from trainers regressed in stage of exercise change scores, and those who received aid showed more progress or maintenance within the stages. Cognitive and behavioral processes of change and scheduling self-efficacy decreased in the control group, while those in the experimental group remained statistically unchanged in these areas. This demonstrates that personal trainers can help influence physical activities, and also aid in the behavioral and cognitive struggles that individuals face in maintaining exercise.

Visualizations about a future self can introduce change in one’s current exercise habits. Murru and Martin Ginis (2010) reviewed the effects of a possible selves intervention on self-regulatory efficacy and exercise behavior. Participants were assigned to a hopeful possible selves or feared possible selves condition. Those in the possible selves conditions were asked to imagine themselves in the future as healthy regular exercisers, or unhealthy sedentary individuals. Participants in these conditions
reported greater exercise behavior four weeks and eight weeks following the interventions than the control group. This indicates that imagining oneself in the future by providing a detailed sense of what may come can either drive one to aspire towards positive change or encourage one to take active preventative measures to avoid becoming an undesirable future self.

Social aid and education may provide simple but effective advantages towards exercise adherence over attempts to exercise independently. Escolar-Reina, Medina-Mirapeix, Gascón-Cánovas, et al. (2010) explored how aid from a patient’s health care provider compared to an exercise prescription. Participants who were simply prescribed exercises expressed negative experiences regarding the amount of time the exercises took, the complexity, and the effects of the exercise. When health care providers presented the patients with knowledge about their disease (chronic neck and lower-back pain), promoted feedback about the exercise experience, provided motivation for physical activity, delivered reminders for exercise, and monitored the patients’ adherence results, patients felt a bond with their health care provider and viewed the experience as more positive. Evaluating patients’ adherence to exercise demonstrated that those who experienced the program more positively were more likely to adhere to their activities. This suggests that providing feedback and monitoring another’s exercise habits not only helps that person continue their program, but it can make the experience seem more enjoyable.

Introducing a powerful reinforcer will increase the likelihood of a behavior occurring. DeVahl, King, and Williamson (2005) wanted to understand if academic
incentives would improve a student’s adherence to a 12-week voluntary exercise program intended to reduce body fat percentage. The potential incentives varied in the amount students would be awarded. One group would be awarded an extra bonus point on an exam for participating, while the other group could receive a bonus point on their overall course grade- a more attractive incentive. Results showed that individuals receiving the greater reward were more likely to remain in the exercise program, which also caused greater decreases in body fat percentages. This recent demonstration of introducing a reward suggests that a powerful incentive can influence dramatic behavioral change.

**Solution Focused Brief Therapy**

The discussion so far has described several ways in which a coach, teacher, or health care professional can assist a person in adhering to an exercise goal. One possible source of techniques for that purpose, which has not often been used, is the field of psychological therapy. One such technique, Solution Focused Brief Therapy, encourages individuals to focus on the goals they want in life, and helps to reveal the individuals’ strengths that can be used in a plan for generating change. This style of counseling has not only been supported as effective in alleviating some serious problems, but it is also relatively brief compared to other conventional talk therapy approaches.

Using just one of the techniques in Solution Focused Brief Therapy (SFBT), the miracle question, researchers have been able to help community members visualize their dreams for change, bring about enthusiastic ideas and plans for bettering
the conditions of the community, and produce immediate actions and long-term preparation for future changes (Hollingsworth, Allen-Meares, Shanks, & Grant, 2009). SFBT also contributed towards helping over 80% of individuals in a study with drinking problems abstain from drinking or control their drinking, as reported by participants four-years following their involvement in therapy (De Shazer & Isebert, 2003). Daki and Savage (2010) were able to demonstrate that children with reading difficulties were able to improve academically and address emotional concerns with the aid of Solution Focused counseling after just five 40-minute sessions.

SFBT has demonstrated itself as an effective form of therapy that is goal oriented, capable of inducing dramatic change, and is relatively brief. Solution Focused Brief Therapy therapists employ techniques such as scaling questions, relationship questions, exception questions, and tasks that allow for the assembly of goals and solutions for clients. Some of these useful approaches will be elaborated upon.

**SFBT Basic Responding Strategies**

Cotton (2010) investigated the practice of how SFBT functions so that the findings would be able to aid therapists in understanding how solution talk encourages a process of change for clients in a therapeutic context. Reviewing a therapy session with Insoo Kim Berg, an American psychotherapist who was a pioneer of SFBT, Cotton was able to evaluate some effective techniques that encourage adopting an alternative perspective towards one’s struggles.

A question of difference is identified as a question that presumes that something needs to be different. It involves a process of communication that helps to
identify a “difference, which makes a difference” (Cotton, 2010). The therapist may inquire, “What do you suppose needs to be different in your life that will let you know that it was a good thing that you came and talked to me today?” Inspiring a client to consider what changes need to occur in his or her life in order for positive changes to follow, helps the client establish new frames of mind that can be used to initiate goal development.

Presupposing questions, questions that embed an assumption, are also utilized to provoke new ways of thinking. For example, in a therapy session, Insoo Kim Berg says to her client, “So suppose you find that… what’s happening to you and how you react to things are pretty normal. How is that going to be helpful, how would that be helpful for you?” The question presumes that the client is normal, and the goal is that, in answering the question, the client will discover something that is helpful for her.

Relationship questions can be used to generate feedback from clients by exploring their experiences with others, and by discovering how those relationships are meaningful. By presuming the client is capable of change, and through having the individual explore how change can affect their relationship with others, the client may see how taking action is important. An example with Berg includes, “So suppose you are able to do that (make a specific change in your life)...what would people around you notice different about you that would let them know you are able to let things blow into the wind, and you can go on with your life?” Asking the client to create a hypothetical experience with a friend or family member, as if the client has already
made changes in his or her life, allows that person to visualize what adjustments can do to relationships before they are put into effect.

Exception questions can be used as tools for identifying a client’s strengths. Providing a client with feedback relating to when a problem did not occur or was less severe helps the therapist acknowledge strengths that the client has possessed that may be useful in the future. Emphasizing the times when the client suggested that he or she had control over a situation can be useful to punctuate a client’s strengths—especially when the individual expresses feelings of losing control.

Utilizing questions of difference, presupposing, relationship, and exception questions can create opportunities for a person to explore change before it has happened. Finding individuals’ strengths and helping them figure out how to use those powerful qualities in a plan for the future will enhance their opportunity for succeeding at their pursuits.

This review has addressed what difficulties people perceive when choosing not to exercise, what qualities and factors can command success for starting or maintaining new behaviors, what interventions have been effective towards generating personal change, and how Solution Focused Brief Therapy incorporates an array of techniques to influence positive transformations.

The purpose of this study is to help individuals adhere to an exercise program over time. Anshel and Seipel (2009) demonstrated the effectiveness of the Exerciser Checklist, and suggested that adherence to the exercise program was the result of newly adopted exercise behaviors. Solution Focused Brief Therapy should be
an effective intervention because it encourages participants to implement plans for change, helps them visualize a future self, finds exceptions to problems and reveals personal strengths, and it is a rewarding social experience. The evidence presented in this review also revealed that the stage of behavioral change an individual is in depends upon personal attributes, or developing specific qualities. Kennet et al. (2009) showed that individuals in the Maintenance stage were more likely to have high self-efficacy for scheduling exercise into their routine. The discussion also presented that the reasons people are motivated to succeed at something influences the likelihood that they may, or may not, continue working towards their goal. Lewis and Sutton (2011) demonstrated that those who were Autonomously oriented (internally motivated) were positively correlated with increased exercise participation, while those who were Control oriented (externally motivated) or Impersonally oriented were negatively correlated with exercise participation. Based on the previous discussion, this study proposes and tests the following hypotheses.

**Hypotheses**

**Hypothesis 1:** Participants receiving SFBT treatment will be the most successful at adhering to the exercise goal, followed by the Exerciser Checklist condition. The control group will produce little, if any, changes in exercise habits.

**Hypothesis 2:** Individuals in the Maintenance Stage of Change category will be the most successful at adhering to the exercise goal, followed successively in decreasing order of goal-adherence by the categories: Action, Preparation,
Contemplation, Pre-Contemplation (believers in exercise), and Pre-Contemplation (non-believers in exercise).

Hypothesis 3: Individuals who score high for being Autonomously oriented will be the most likely to adhere to the exercise goal, followed by those Control oriented. Those Impersonally oriented will be least likely to adhere to the goal.
CHAPTER III

METHODOLOGY

Design

This study was performed as a repeated measures, between-subjects design. The independent variable was Intervention Condition, which was operationalized using three levels: Solution Focused Brief Therapy condition, Exerciser Checklist condition, and the Control condition. The dependent variable, Goal Adherence, was measured over the course of four weeks, where each week participants had the goal of completing five 30-minute cardiovascular workouts. Each participant’s ability to adhere to this goal was measured at a weekly meeting with the researcher.

Participants

The participant sample of 34 exercisers included 25 females and 9 males. A sign up booth was set up at the entrance of the University’s Psychology department to recruit participants. Here, students were able to ask the researcher basic details concerning their involvement in the study and, if they were interested, they had the opportunity to sign up for participation. Sheets with the researcher’s contact information were also posted on a wall in the Psychology department for others who were interested in being involved. Students were informed that they could receive up to 2.5 hours of research participation, or 30 minutes for each meeting they attended with the researcher. Participation hours could be exchanged for extra credit points in certain courses if the
professor allowed it. Their ages ranged from 18 to 46 years ($M = 22; \ SD = 5.28$). A majority of participants reported exercising at least 3 times a week ($M = 2.91$). Exercise consistency, preceding involvement in an intervention condition, varied (see Table 1).

Table 1

*Exercise Consistency Self-Report Before Exercise Intervention*

<table>
<thead>
<tr>
<th>Timespan</th>
<th>Participants</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 Weeks</td>
<td>4</td>
<td>11.8</td>
</tr>
<tr>
<td>2 Weeks to 2 Months</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td>2 Months to 5 Months</td>
<td>6</td>
<td>17.6</td>
</tr>
<tr>
<td>6 Months to 1 Year</td>
<td>6</td>
<td>17.6</td>
</tr>
<tr>
<td>1 Year or Greater</td>
<td>10</td>
<td>29.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Materials

To measure behavioral stage of change, the Exercise: Stages of Change – Continuous Measure (Marcus, Selby, Niaura & Rossi, 1992, and Reed, 1994) was used. The Exercise: Stages of Change – Continuous Measure is a 24 item test using a 5-point agreement scale, measuring each of the 6 factors: Precontemplation (non-believers in exercise), Precontemplation (believers in exercise), Contemplation, Preparation, Action, and Maintenance. These represent ordered categories along a continuum of motivational readiness to change a behavior. Examples of items measuring the various factors are:
Precontemplation (non-believers in exercise) – “As far as I’m concerned, I don’t need to exercise regularly.”; Precontemplation (believers in exercise) – “I know that regular exercise is worthwhile, but I don’t have time for it in the near future.”; Contemplation – “I have been thinking that I might want to start exercising regularly.”; Preparation – “I have set up a day and a time to start exercising regularly within the next few weeks.”; Action – “I have started to exercise regularly, and I plan to continue.”; Maintenance – “I have been successful at exercising regularly and I plan to continue.”

The Exercise: Stages of Change – Continuous Measure, has been tested for reliability. Lerdal, Moe, Digre, et al., (2008) wanted to investigate the psychometric properties of the American English measure, and translate it into a Norwegian version. They calculated that the six factors accounted for 73% of the variance. The reliability of each sub-scale was assessed by Chronbach’s alpha, where coefficients for these factors ranged from 0.72 to 0.92 (Lerdal et al., 2008).

To measure motivation for exercise, the Exercise Motivation Inventory – 2 (EMI-2) was administered (Markland & Ingledeew, 1997). The EMI-2 is a 51 item test using a 6-point agreement scale (“Not at all true for me” to “Very true for me”), measuring 14 subscales: Stress Management, Revitalization, Enjoyment, Challenge, Social Recognition, Affiliation, Competition, Health Pressures, Ill-Health Avoidance, Positive Health, Weight Management, Appearance, Strength and Endurance, and Nimbleness. Some examples of items include: “To stay slim,” “To avoid ill health,” “To show my worth to others,” and “To build strength.” The EMI-2 has been used to investigate college students’ motivations for physical activity (Kilpatrick et al., 2005), the relationship between sexuality and exercise motivations (Grogan, Conner, & Smithson,
2006), and has been utilized in numerous others. It has also been improved to increase the test’s reliability and validity (Markland & Ingledew, 1997). In order to determine internal consistency of the scales, Markland and Ingledew (1997) calculated Chronbach’s alpha reliability coefficients. Alphas indicated the reliability of all the scales was good (.832 to .954) apart from Health Pressures, which was only acceptable (.686).

To measure individual differences in the extent to which people seek to be autonomous or controlled in the regulation of their exercise behavior, the Exercise Causality Orientations Scale (ECOS) was used (Rose, Markland & Parfitt, 2001). The ECOS included 7 scenarios that addressed aspects of the exercise experience. Each scenario contained 3 responses—each corresponding to a causality orientation—that were measured on a 7-point agreement scale (“Very unlikely” to “Very likely”). The assessment measured whether the individual had a general tendency to be autonomous, controlled, or had an impersonal orientation. An example of one context specific scenario and its items includes: “You are beginning a new exercise program. You are likely to- a) Attend a structured exercise class where an exercise leader is telling you what to do (controlled); b) Decide for yourself which type of exercise you would like to complete (autonomous); c) Tag along with your friends and do what they do (impersonal).

The ECOS measure has been explored to test its relationship with Stages of Change (Rose et al, 2005), and has been evaluated to examine its validity (Rose et al, 2001). The internal consistency of the three subscales of the Exercise Causality Orientations Scale was investigated using Cronbach’s alpha. Rose et al. (2001) calculated Chronbach’s alphas for the seven-scenario model, alphas were: Autonomy 0.70, Control 0.65, and Impersonal 0.68.
Procedure

Understanding that participants would be required to meet with the researcher once a week for up to four follow-up sessions, it was important to demonstrate to each participant the value of their involvement. In the first meeting with the exercise coach, each individual was warmly greeted and was thanked for taking his or her time to be there on that day. Participants were told that they were doing themselves a big favor by partaking in an opportunity that could be of great benefit to their health, and they were also informed that their efforts were contributing to an important research study. Each participant was personally thanked for helping a fellow student work towards his thesis completion.

In an effort to avoid participants from responding in a manner that was socially desirable, individuals were encouraged to demonstrate honesty. Due to the coincidence that the researcher could be perceived as a peer, participants were informed that, while adherence to the program could be of great benefit to themselves, adhering to, or failing to adhere to the exercise program, would not have an effect on how the researcher perceived them as a person. A condition was set to encourage ongoing weekly participation by reiterating to the participant what the external reward was for being involved in the program. Participants were reminded that in order to receive their full extra credit potential, they must continue to come to their following weekly sessions. Before filling out forms and measures, the participants were informed that there was the option of withdrawing from the study at any time without penalty.

Participants were asked to fill out the “Physical Activity Readiness Questionnaire,” which is a resource provided by the American Heart Association to
screen for whether the individual is healthy enough to be in an exercise program. If the participant answered, “yes” to any of the conditions, then he or she was asked to decline his or her involvement in the study. If the participant answered “no” to all questions, then he or she would move on to the informed consent form. After signing their consent, participants were requested to fill out the “Exercise: Stages of Change,” “Exercise Motivation,” and “The Exercise Causality Orientations Scale” measures. In the first session with the researcher, participants filled out a profile sheet that collected basic data, including: gender, age, average weekly cardiovascular exercise frequency, average exercise duration, and how long the individual had been consistently achieving these frequency and duration reports.

Participants thereupon received detailed information regarding their requirements for the study. Individuals were informed that the goal of the study was for them to engage in five 30 minute exercise sessions a week, and perform at a pace that would cause them to break a sweat, yet still maintain the ability to carry on a normal conversation (or so that the individuals do not have to take pauses between words in a sentence to catch their breath). Participants were asked to utilize an elliptical walker machine for their exercise, and were informed that it was possible to request an alternative, or more highly preferred, mode of exercise. They were asked to either take snapshots of their digital exercise readouts, or, if they did not have a camera on their phone, they were encouraged to be honest in writing down the day, time, and duration of their exercise sessions. Participants were reminded that they would share these images or recordings with the researcher at their next meeting together.
Participants were randomly assigned to an exercise intervention condition using a random group number generator at http://www.random.org. Participants were placed in one of three groups: Solution Focused Brief Therapy (SFBT) group, Exercise Checklist group, or the control group. All participants received individual attention from the researcher at their set days and times.

**Solution Focused Brief Therapy Condition**

Those who were assigned to the Solution Focused Brief Therapy group engaged in dialogue with the researcher. The researcher used two main questioning tools, which were adopted techniques from SFBT. One technique, called the scaling technique, was used to evaluate the individuals’ perceived fitness level with regard to their desired fitness goal. The scale ranged from 0-10, with 0 being perceived as the poorest fitness level, and 10 being their desired fitness goal. Participants were asked where they thought they would score themselves on the scale, and were then encouraged to verbally expand upon why they felt that was appropriate. Next, these participants were asked to describe their life as if they had achieved their perceived fitness score of 10, and were encouraged to describe how they anticipate they would interact in the world if they were so. Some examples of this questioning include: “How might you feel different emotionally?”; “What would now be achievable physically (ex. What weight could be lifted, how long could a physical task be endured, what athletic attributes would be gained)?”;“How might interactions with peers be different?”;“Would there be any changes is physical image?”;“How might this influence other areas of life?” Other future focused questioning may have followed. Participants were then asked if there was ever a time in their life when they were closer to 10 on the scale than they were now. If they could think of a
time when this may have been, then they were asked to explain what they were doing or what activities they were involved in, and give a number rating for their perceived fitness level for that time. The researcher questioned the participant with regard to what may have contributed to differences in success from what they were experiencing then, to what they were experiencing now.

A second technique utilized by the researcher was an additional approach to help the participants see how changes in their exercise habits might affect their lives. The “miracle question” was asked, which included the placement of a miraculous circumstance followed by questioning how such dramatic change would be perceived. The researcher would start off by helping create an image, and would say, “Suppose that tonight starts off like any other night. You go through your normal bedtime routine, and go to bed around (ask participant their usual bedtime and insert) and are able to fall asleep around (30 minutes after expressed bedtime). Well, as you are sleeping something dramatic happens- something miraculous! It happens around 3am in the morning, but you are still sleeping and completely unaware that anything has occurred. You have now, in an instant, changed into your “10 self” (the 10 score given in the scaling question)!

(Pause 5-10 seconds). So, you wake up without any knowledge of this change having happened. (Pause 5-10 seconds). What would be your first indication that something has occurred?” As the participants produced ideas, the researcher would listen and then attempt to inspire further idea development through questioning. Further questioning was designed to help the participants experience how improvement in their fitness level could produce change in their everyday lives.
Subsequent meetings with participants in the Solution Focused Brief Therapy group were organized to assess change, and to promote generating an action plan to inspire future movement. Each week participants were requested to re-evaluate their fitness scores. They were asked what they thought was working for them, and what they thought might be interfering with their success. The researcher would focus on reiterating the participants’ messages, and would proceed with questioning concerning how their strategy for change could be arranged to maximize its effectiveness. At each sessions’ end, participants were asked to write their plan for achieving the study’s exercise goal (five 30 minute exercise sessions) for the upcoming week. The participant turned in this review without receiving feedback from the researcher.

Exerciser Checklist Condition

Participants who were randomly assigned to the Exerciser Checklist group were given Anshel’s Exerciser Checklist to complete. Before circling their ratings, participants were asked to give their full attention to the checklist, and consider their thoughts and behaviors towards exercise that occur throughout any given day. After completing the checklist, the researcher reviewed the ratings with the participants and brought up their areas of strength, or areas that could use more attention. At the end of the session, participants were asked to write their plan for achieving the study’s exercise goal (five 30 minute exercise sessions) for the upcoming week.

For each following meeting with those in the Exercise Checklist group, the researcher asked participants to fill out a new checklist. The researcher also gave the participants their previous weeks checklist, and had them record any differences found between scores. The researcher emphasized that the reason for finding these score
differences was to give participants an opportunity to personally assess where they had either improved or declined. Once score differences had been noted, the researcher and participant discussed what might have contributed to the changes. Because there were many statements on the exercise checklist and there was only a 30-minute allotted meeting time, not every individual score was questioned. The researcher asked up to five questions (one for each section of the checklist) after reviewing any noticeable differences with the exerciser; an example of this questioning includes: “I see that your ‘Day of Exercise’ scores for your thoughts and behaviors towards exercise have improved. What would you say contributed to those changes?” Participants were also praised for each score improvement. After reviewing the checklist, participants were asked to write their plan for achieving the study’s exercise goal (five 30 minute exercise sessions) for the upcoming week. The participant turned in this review without receiving feedback from the researcher.

Control Group Condition

Participants in the control condition received no type of aid. In following meetings, the exercisers were asked to report their weekly exercise activity just as those in the SFBT group and Exercise Checklist group did. Participants were then asked to write their plan for achieving the study’s exercise goal (five 30 minute exercise sessions) for the upcoming week. As in the other conditions, the plan was turned in without further review.
CHAPTER IV

RESULTS

The main hypothesis was that participants in the Solution Focused Brief Therapy group would be the most likely to achieve meeting the exercise goal of five 30-minute sessions a week. The exercise checklist group was considered to be more likely to achieve the exercise goal than the control group. A one-way between-groups analysis of variance was conducted to test this hypothesis. There was not a statistically significant difference at the \( \alpha = .05 \) level for goal adherence for the three conditions \((F (2, 30) = .30, p = .74)\). The actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared was .02. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for SFBT \((M = 3.50, SD = 1.38)\) was not significantly different from the Checklist group \((M = 3.93, SD = 1.44)\) or control group \((M = 3.53, SD = 1.42)\).

A mixed between-within subjects analysis of variance was conducted to assess the impact of the three different interventions (SFBT, Checklist, and Control) on participants' change in weekly exercise frequencies across four weeks. There was no significant interaction between change in weekly exercise frequency and condition \((F (6, 60) = 1.18, p = .33)\). There was not a substantial main effect for change in exercise frequencies, \(F (3, 60) = 1.08, p = .37\). The main effect comparing the three interventions
was significant, \( F (2, 20) = 3.78, p = .04 \), partial eta squared = .27, suggesting a difference in the effectiveness of the three approaches (See Figure 1).

![Weekly Exercise Frequency Averages (Days)](image)

**Figure 1.** Exercise frequency over time.

It was hypothesized that those in the Maintenance Stage of Change group would be the most successful in adhering to the exercise goal, followed successively in decreasing order of goal-adherence by the groups: Action, Preparation, Contemplation, Pre-Contemplation (believers in exercise), and Pre-Contemplation (non-believers in exercise). A one-way between-groups analysis of variance was used to examine this hypothesis. Participants' scores on the stage of change measure could place them in one
of six groups. However, in this study participants only scored in three of the six groups: Contemplation, Action, or Maintenance. There was a statistically significant difference at the $p < .05$ level for goal adherence for the three stage of change groups: $F(2, 30) = 3.53$, $p = .04$. The effect size, calculated using eta squared was .19. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Contemplation ($M = 2.96$, $SD = 1.28$) was approaching significant differences from the Maintenance group ($M = 4.07$, $SD = 1.32$). The Action group ($M = 4.5$, $SD = .90$) did not differ significantly from either the Contemplation or Maintenance group (See Figure 2).

A one-way between-groups analysis of covariance was conducted to compare the effect of the three intervention methods (SFBT, Checklist, Control) on goal adherence while controlling for some previously assessed variables: Stage of Change, previous average weekly cardio exercise frequency, and previous average exercise duration. Each of these three variables was used as covariates in separate analyses to determine their influence on goal adherence.

After adjusting for stage of change, there was no significant difference between the three intervention groups on meeting the exercise goal, $F(2, 29) = .45$, $p = .64$, partial eta squared = .03. There was a moderate relationship between the stage of change and goal adherence, as indicated by a partial eta squared value of .16.

After adjusting for previous average weekly cardio frequency, there was no significant difference between the three intervention groups on meeting the exercise goal, $F(2, 29) = .21$, $p = .82$, partial eta squared = .01. There was a moderate relationship
between the previous average weekly cardio frequency and goal adherence, as specified by a partial eta squared value of .27.

After adjusting for previous exercise duration, there was no significant difference between the three intervention groups on meeting the exercise goal, $F(2, 29) = .29, p = .75$, partial eta squared = .02. There was a moderate relationship between previous exercise duration and goal adherence, suggested by a partial eta squared value of .17.
It was hypothesized that participants who scored high in the Autonomy category in the Exercise Causality Orientation Scale would be the most likely to meet the exercise goal, followed by those in the Control group. Those in the Impersonal group were thought to be the least likely to adhere to the goal. A one-way between-groups analysis of variance was used to examine this hypothesis. There was a statistically significant difference at the $p < .05$ level for goal adherence for the three groups: $F(2, 30) = 3.77, p = .04$. However, in this study 28 of the 33 participants scored in the Autonomy group. The effect was therefore driven by unequal numbers of cases in each group. Acknowledging this, participants' Autonomy scores were listed and compared as continuous scores. The relationship between the Autonomy score and exercise goal achievement was investigated using Pearson product-moment correlation coefficient. There was a weak, positive correlation between the two variables, $r = .17, n = 33, p = .36$, as higher levels scored on the Autonomy scale were associated with higher goal achievement scores.

To determine a possible influence of Exercise Motivation, a one-way between-groups analysis of variance was used to examine its impact on goal adherence. Participants' scores on the Exercise Motivations Inventory could place them in one of fourteen groups. There was not a statistically significant difference at the $p < .05$ level for goal achievement for the fourteen groups: $F(7, 25) = .08, p = .40$. However, in this study 7 of the 33 participants scored in the stress management group, 7 of the 33 scored in the weight management group, 9 of the 33 scored in the strength and endurance group, and the remaining 10 fell in to small groups or separate categories. Because there were 14
motivation categories, but most participants scored in three of the categories, participants' stress management, weight management, and strength and endurance scores were listed and compared as continuous scores. The relationship between meeting the weekly exercise goal and stress management, weight management, and strength and endurance scores was analyzed using Pearson product-moment correlation coefficient. There were very weak correlations between meeting the exercise goal and: stress management, \( r = -.11, n = 33, p = .56 \), weight management, \( r = -.06, n = 33, p = .74 \), and strength and endurance scores, \( r = -.18, n = 33, p = .32 \).
CHAPTER V

DISCUSSION

Hypothesis 1

The purpose of this study was to evaluate the effectiveness of three intervention methods on exercise adherence. It was hypothesized that participants receiving Solution Focused Brief Therapy would be the most successful at adhering to the exercising goal, followed by the Exerciser Checklist condition. This hypothesis was not supported, as there were no significant differences between the SFBT, Exerciser Checklist, and Control condition for goal adherence.

However, a repeated measures analysis revealed a trend for increased exercise adherence for the SFBT condition (see Figure 1). The main effect comparing the three intervention conditions was significant, which suggests there was a difference in the effectiveness of the three approaches. Both the Exerciser Checklist and Control condition did, on average, demonstrate greater goal adherence than the SFBT group throughout the study, but the SFBT condition showed a non-significant trend for greater improvement over time than the other groups (SFBT First Week Frequency $M = 2.5$, Last Week $M = 3.63$).

Even though the effect of change over time did not prove significant, some interesting trends were found for the three intervention conditions. Exerciser Checklist participants showed initial improvements for exercise adherence, but for their fourth
week of exercise they were reporting frequencies that were consistent with where they started. The results demonstrate that the Exerciser Checklist was able to maintain exercise behaviors throughout the study. The Control condition demonstrated slight increases in exercise frequency by the third week of the study, but on their fourth week of exercise participants reported frequencies that were, on average, below their first week. This suggests that a lack of aid could result in decreased exercise frequency over time.

The immediate increases in exercise adherence observed for the Exerciser Checklist group could be due to the straightforward structure of the checklist- participants were essentially given a list of behaviors that they should abide by if they wanted to become successful exercisers. The checklist statements, referring to what a successful exerciser should be thinking about, may have acted as tools for empowerment that gave participants the strength to believe they were capable of exercise. Rhodes and Fialia (2009) showed that those with high self-efficacy were more likely to exercise. The behavioral and cognitive statements within the checklist may have also have been inspiring initially because of their novelty to the participant. At the end of the study however, a slight decline was observed in exercise frequency for the checklist group- perhaps the redundant nature of the approach reduced enthusiasm over time.

SFBT participants did have lower adherence scores, but weekly frequency averages showed dramatic improvement by the final week of exercise. Unlike the Exercise Checklist group, SFBT participants did not have a thoroughly developed personal plan for exercise at the beginning of the study. As the weeks progressed, discussions with the researcher revealed factors that may have hindered their
performance, and improved solutions were devised to aid progress. By the end of the study, SFBT participants had a greater sense of their strengths, articulated plans for exercise, and an elaborated vision of what they wanted in the future. Fischer and Bryant (2008) revealed the benefits of having a trainer for exercise participation, and showed that those who did not benefit from training regressed in their activities. The researcher for the SFBT condition may have provided the social support necessary for encouraging maintenance or improvement.

Despite the witnessed improvements for the SFBT condition, exercise frequencies were lower than the Control group throughout the study until the final week. There were no major differences for previous exercise frequencies or durations amongst the three interventions, so the low exercise frequencies for the SFBT did come as a surprise. SFBT participants did report significantly higher Autonomy scores than the Exerciser Checklist condition, and also reported higher, but non-significant, Autonomy scores than the Control condition. It is possible that SFBT participants saw the study as an opportunity to gain information for their exercise pursuits, but chose not to initially incorporate what they had learned into their exercise routine. Because of the non-judgmental nature of the therapy, it may also be possible that SFBT participants felt at ease for poor adherence. If participants believed that they would get support throughout the study no matter what their results were, then they might not have felt pressured to meet the exercise goal. Participants in the Control condition were only given instructions to exercise five times a week, and write out their plan for exercise—this simple and straightforward approach might not have led people to believe that failure was forgivable.
While comparing groups did not yield significant differences for exercise adherence amongst the three interventions, a significant main effect was found for the groups. The exerciser checklist showed promising results, and was very effective at helping people adhere to the exercise program. The Control condition performed considerably well considering their lack of guidance throughout the study. The SFBT condition did represent the poorest exercise adherence, but the substantial improvements observed over time implicate promising trends towards success.

Hypothesis 2

It was hypothesized that individuals in the Maintenance Stage of Change category would be the most successful at adhering to the exercise goal. This hypothesis was not supported. Participants only placed in three of the six stages: Contemplation, Action, and Maintenance. Action participants actually had the highest means for exercise frequency ($M = 4.5$), followed by Maintenance ($M = 4.07$) and Contemplation ($M = 2.96$).

It was believed that Maintenance participants would be the best at adhering to the exercise goal because of the behaviors they had developed over time. Maintenance of exercise behaviors also instills a sense of resourcefulness that can be helpful for incorporating exercise into one’s life (Kennet et al., 2009). However, meeting the exercise goal required participants to exercise five times a week, which was a weekly frequency that some Maintenance participants were not yet achieving. This adaptation may have been difficult for some participants- it is possible that they may have rationalized that the frequency they were maintaining was already sufficient. Action
participants may have been more enthusiastic towards physical activity. Participants were categorized as being in the Action Stage of Change if their exercise behaviors had not yet persisted for six months. Those who have just begun a new behavior, and who are willing to sign up for a study that may enhance their exercise habits, may exhibit a level of motivation and willingness to exercise that is beyond those who are accustomed to or just considering exercising.

**Hypothesis 3**

It was hypothesized that Individuals who score high for being Autonomously oriented would be the most likely to adhere to the exercise goal. This hypothesis was supported, but findings were relatively weak. Unequal numbers drove the significant differences observed between the orientations groups, where 28 of the 33 participants scored as being more Autonomously oriented. Therefore, all participants’ Autonomy scores were listed as continuous scores and compared to the exercise goal. A weak positive correlation was seen between one’s Autonomy score and their level of adherence.

Autonomously oriented individuals are driven by internal motivations. Rose et al. (2001) expressed that Autonomously oriented individuals strive to be self-determining, and will seek opportunities as sources of information to regulate their own chosen behavior. It is possible that many of the participants who signed up for this study viewed it as a resource for personal improvement, and believed that valuable information would be disclosed. The flier that was posted for recruiting participants did ask if people wanted to “improve their exercise habits” or “benefit their health,” which may be the
reason many Autonomously oriented, information seeking, individuals signed up for the study. Perhaps more Control oriented, externally motivated, individuals would have expressed their enthusiasm to participate if the flier focused on concepts such as weight loss, improved muscle tone, or enhanced physique.

**Limitations**

The low number of participants really limited the potential of this investigation. The researcher was limited to two days a week that he could work with participants, and because each person received individual attention there were time constraints that did not make having a larger sample size an option. Additionally, participants were only recruited from the Psychology department because of incentives offered to students for research participation. An unfortunate coincidence was that over half of participants were just starting or maintaining exercise, which limited the amount of progress that could be seen across the Stages of Change and frequencies of exercise. A major confound in this study is that the researcher had relatively little experience when compared to actual Solution Focused Therapists. The researcher had only taken an introductory counseling course, and had worked with no more than four peers in the laboratory/training section of the course. His understanding was limited to the information learned in books, peer reviewed articles, Internet resources, and advice from professionals with counseling experience.

**Future Research**

Participants did benefit from their involvement in this study. The evidence showed trends for success with a researcher who had such little experience with therapy,
and implications suggest that an actual Solution Focused Brief Therapist may be able to introduce greater changes. A larger and more diverse sample of participants needs to be evaluated to determine the generalizability of this research. It would also be important to investigate what techniques used in SFBT are the most successful at motivating exercise habits. Reasons for why the SFBT condition, which had the highest Autonomy scores, had lower exercise adherence that the Checklist or Control group should be explored. It would be interesting to discover if this study was perceived as too structured for Autonomously oriented individuals, who may prefer choice over their exercise activities (Rose et al., 2001). Future research could also evaluate whether those in the Action Stage of Change are more motivated to exercise than those in Maintenance.

With the substantially growing evidence for how physical exercise can promote positive health and aid in preventing debilitating ailments, finding approaches that motivate people to be physically active is important. Given that some of the effective methods, such as hiring and using a personal trainer, can be costly to individuals, it seems necessary to discover a more affordable approach. While counseling is not necessarily affordable to all, some of the techniques used in SFBT might be adopted and adapted for new exercise intervention techniques. This study did not reveal that the therapy provided was better than the other interventions, but it did show promise over time. Perhaps future exercise interventionists will see utility in helping individuals generate an individualized plan for capturing their vision of a healthier self.
REFERENCES
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