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Motivating Clients to Exercise: Improving Adherence to Exercise-Based Treatment through Psychoeducation

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MOTIVATING CLIENTS TO EXERCISE: IMPROVING ADHERENCE TO EXERCISE-BASED TREATMENT THROUGH PSYCHOEDUCATION

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Improving Adherence to Exercise-Based Treatment through Psychoeducation

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Abstract

Exercise has been consistently shown to have a positive effect on both physical and mental health, with past studies indicating exercise as an adjunctive treatment for diagnoses such as Major Depressive Disorder. However, despite the knowledge of exercise's benefits, 80% of Americans do not regularly meet recommended levels of exercise in a week. Past studies have been hampered by high drop-out rates, as participants have difficulty sustaining a new exercise regimen over time. This study focused on understanding the motivational processes which sustained experienced exercisers. With the information gleaned from experienced exercisers in addition to past research on human motivation, a psychoeducational pamphlet was constructed in order to determine the motivational processes for nascent exercisers in addition to determining if the pamphlet, as an intervention, was helpful in sustaining new regimens. The study found that the psychoeducational pamphlet was not able to sustain new regimens when compared to a control condition. However, participants in the experimental condition demonstrated significant reductions in depressive and anxious symptoms at a follow-up compared to initial scores. This dissertation is available in open access at AURA, http://aura.antioch.edu/ and the OhioLINK ETD Center, https://etd.ohiolink.edu/

Keywords: exercise, depression, anxiety, bipolar, eating disorder, motivation

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Chapter I: Introduction

The psychological and physical benefits of exercise are widely recognized, yet nearly 80% of Americans do not meet recommended levels of exercise in a week (Clarke, Norris, & Schiller, 2017). Exercise not only promotes physical and mental well-being overall, it also specifically combats negative physical conditions commonly linked with mental illness, including obesity, hypertension, and Type 2 diabetes (Citromea & Vreeland, 2009). However, it appears that knowing the benefits of exercise is not a sufficient motivator for people, with or without mental illness, to initiate a regular exercise regimen. Alongside the growing awareness of the benefits of exercise has come an increased interest in implementing non-traditional treatments within the field of mental health in addition to traditional approaches, such as psychotherapy and psychopharmacology (Barnes, Powell-Griner, McFann, & Nahin, 2008). The field of physical exercise is one such non-traditional treatment option that is of particular value because of its low-cost compared to traditional treatments. Additionally, exercise offers several direct and indirect benefits for people suffering with mental health conditions (CDC, 2013). Some exercises, such as yoga, contain elements that have been recognized to provide particular emotional benefits to the participant (Ross & Thomas, 2010).

Despite a greater movement in the mental health community to implement physical activity in treatment plans, clients typically do not sustain an exercise routine long enough for the benefits to be evident. Many clients will exercise for a short period of time before ceasing their regimen due to a lack of motivation that can be caused by issues ranging from disappointment in not seeing results quickly

enough to an expectation of facing significant physical discomfort during the initial stages of exercise engagement (Kane et al, 2010; King, Hopkins, Caudwell, Stubbs, & Blundell, 2009).

There are four broad categories of exercise: aerobic, strength building, balancing, and flexibility (Go4Life, 2017). Aerobic, also known as endurance exercise, increases the participants' respiration and heart rates, with intensity usually measured through oxygen (O_2) uptake or heart rate. Examples of aerobic exercise include walking, jogging, cycling, and dancing. Strength, or resistance, training exercises aim to increase the mass and efficiency of muscles. This type of exercise is typically done by utilizing muscles for pushing and pulling in opposition to gravity. Balancing exercises help prevent future falls by improving one's balance and are vitally important for older adults. Many strength-based exercises that target the lower body, such as leg swings and squats, also improve balance. Finally, flexibility exercises stretch the body's muscles and help patients stay limber. Examples of flexibility exercises include stretching, Pilates, and yoga.

As of 2018, the U.S. Department of Health and Human Services recommended that adults get 150 minutes of moderate, or 75 minutes of vigorous, aerobic exercise per week, in addition to conducting muscle strengthening exercises at least twice per week (2018 Physical Activity Guidelines Advisory Committee, 2018). Recommended levels of exercise for children are 60 minutes of exercise per day (largely comprised of aerobic exercise) in addition to muscle and bone strengthening exercises three times per week. Older adults are recommended to

follow the adult guidelines to the best of their ability given any potential disabilities or muscular deterioration.

Because physical exercise is such a critical component of good health, including good mental health, and considering that people find it difficult to sustain a regular exercise regimen, it is important to study the underlying motivational processes that might help people sustain regular exercises.

Exercise programs are now a regular element in many inpatient psychiatric treatment programs (Stanton & Happell, 2014), This study will create a program aimed at increasing motivation in nascent exercisers through the use of a psychoeducational pamphlet outlining motivational strategies designed to increase its readers' engagement with and adherence to their exercise routine. Created for the study, this pamphlet will also provide a step-by-step model that will help participant reactivate flagging motivation. Given the vital benefits an exercise program provides as a component of mental health treatment, and given people's difficulty sustaining exercise engagement, it is critical to find an effective means to support clients in the initial stages of an exercise program and to ensure they sustain their exercise program across time.

Specific Aims & Hypotheses

The aims and hypotheses of this study are:

1. To examine if a psychoeducational program aimed at motivating participants to exercise will increase exercise engagement in beginning exercisers after three months.

a. *Hypothesis: There will be a significant improvement in exercise engagement in the experimental versus the control groups.*

b. *Hypothesis: There will be a significant improvement in participants' motivation between baseline and three months post-intervention.*

2. To examine if a psychoeducational pamphlet aimed at improving motivation to exercise will increase exercise engagement in beginning exercisers with elevated anxiety and/or depressive symptoms after three months.

a. *Hypothesis: There will be a significant improvement in exercise engagement in the experimental versus the control groups for participants with elevated anxiety and/or depressive symptoms*

b. *Hypothesis: There will be a significant difference in types of motivations utilized between participants with elevated anxiety and/or depressive symptoms as compared to participants without elevated symptoms.*

c. *Hypothesis: There will be a significant reduction in depressive and anxious symptoms between baseline and three months post-intervention*

3. To examine if there are specific motivational strategies utilized by experienced exercisers that has not been covered in the literature.

a. *Hypothesis: There will be strategies utilized by experienced exercisers that have not been outlined in the literature that will prove beneficial to the psychoeducational material.*

Chapter II: Literature Review

High dropout rates constitute a major limitation of the research literature on exercise-based interventions in psychotherapy. Researchers found an average dropout rate of 18.1% among 42 studies focused on exercise in patients with depressive symptoms published between 1979 and 2015 (Stubbs et al., 2016). Factors that may be negatively impacting retention rates in exercise-based research include higher baseline depression rates, unsupervised exercise, individual exercise, exercise done in outpatient treatment, and studies conducted among participants who are not benefitting from primary treatments, such as antidepressants (Stubbs et al., 2016). Additionally, motivational issues are prevalent in both clinical and non-clinical populations (Hagger, Chatzisarantis, & Harris, 2006). It has been suggested that including a motivational component in studies may help reduce the dropout rate in future studies.

Self-Determination Theory

Much of the research concerning exercise motivation focuses on self-determination theory, a macrotheory of human behavior that focuses on specific components, rather than just amount, of motivation (Deci & Ryan, 2008). The major areas of self-determination theory cover types of motivation, basic psychological needs, causality orientation, and life goals.

Self-determination theory covers two major types of motivation: autonomous and controlled (Deci & Ryan, 2008). Autonomous forms of motivation arise when the individual identifies with the behavior's value and integrates that value into the self. Controlled motivation stems from external and introjected

regulation, pressuring individuals to behave in a socially controlled manner. Autonomous motivation is typically linked with greater psychological health, more effective performance, and long-term persistence in activities.

"Basic psychological needs" are conceptualized as universal needs that must be met for optimal functioning. There are three broad psychological needs outlined in self-determination theory: competence, relatedness, and autonomy (Deci & Ryan, 2008). Competence refers to the need to express mastery over a behavior and the experience of control over the behavior's outcome. The need for relatedness reflects the universal desire to interact and be intimately connected with others. The need for autonomy is met when the individual feels like the causal agent of his or her own life and views their behavior as in accordance with an integrated sense of self.

The number and types of psychological needs being met determine an individual's causality orientation (Deci & Ryan, 2008). An autonomous causality orientation is seen as present when an individual has ongoing satisfaction in all three of the above defined basic psychological needs. An autonomous orientation is considered the healthiest causality orientation. When an individual has met their needs for competence and relatedness, but not their need for autonomy, they will have a controlled causality orientation. Individuals with a controlled causality orientation are typically motivated by internal and external contingencies and, as a result, tend to exhibit rigid functioning and a diminished sense of well-being. Finally, an interpersonal causality orientation occurs when none of the basic needs are being met; when this occurs, the individual tends to exhibit the poorest sense of functioning and have a belief that outcomes are beyond their control.

Finally, self-determination theory outlines two categories of life goals that operate at differing levels of functioning. Intrinsic life goals, such as affiliation, generativity, and personal development, are associated with the healthiest outcomes and greatest level of functioning. Alternatively, extrinsic motivators, such as wealth, attractiveness, and other external indicators of worth, tend to be associated with a diminished sense of well-being.

Applying self-determination theory to exercise

Self-determination theory is a useful framework for determining internal factors to target in interventions aiming to increase motivation for exercise. If we are able to alter key internal factors to make exercise more personally rewarding and relevant to the client, it becomes more likely that they will adopt exercise as a long-term lifestyle change as opposed to the common cycle of beginning exercise and gradually faltering. For example, in a study examining leisure-time physical activity (LTPA), researchers found that the presence of internal regulators (e.g., finding personal enjoyment from the activity) was the largest predictor for increased LTPA (Taylor, Ntoumandis, Standage, & Spray, 2010). Another study illustrated a positive relationship between engaging in a variety of exercise and met needs of competence (e.g., meeting a physical goal, such as ten pull-ups) and relatedness (e.g., playing a team sport), detailing that one way of increasing adherence to an exercise intervention is to promote a variety of exercises rather than engaging in one type every day (Sylvester et al., 2014).

One major way that self-determination theory can be applied to motivating clients is through the adoption of an exercise identity. Since individuals are

motivated to participate in behaviors that reinforce their sense of self, a strong exercise identity may foster motivation. In one study, researchers demonstrated within-person changes in intrinsic motivation, especially when moving away from introjected and identified (external) regulation, were connected with higher identification with exercise (Ntoumanis et al., 2017). Researchers suggested that exercise-based interventions might benefit from increasing clients' exercise identity and orienting exercise toward enjoyment and personal benefit rather than traditional external regulators for exercise, such as weight loss. Additionally, clients with a higher intrinsic motivation to exercise show higher positive affect during exercise than those with externalized forms of motivation (Shin, Kim, & Kwon, 2014).

There will inevitably be clients concerned with exercise as a weight loss tool. In a three-year project aimed at implementing self-determination theory into a weight loss program, researchers found that participants assigned to a condition emphasizing self-determination theory had higher intrinsic motivation, internal self-regulatory styles, and an internal locus of control, which mediated improved exercise adherence and was associated with significantly greater weight loss (Silva et al., 2009). Furthermore, participants with intrinsically-oriented motivation were more likely to achieve long-term weight loss. Some central features of the participants that maintained physical activity were personal enjoyment, perception of competence, and an intrinsic reason for participating. The researchers suggest that autonomous motivation can be increased by offering exercisers a clear rationale for exercising, acknowledging their inner conflict about exercise

engagement, providing a wide range of options, promoting competence in chosen activities, and avoiding external incentives. In a separate study, participants with higher controlled motivation were more likely to use exercise as a reason to engage in unhealthy behaviors (e.g., "I deserve this candy bar since I ran a mile earlier"), effectively undermining the caloric expenditure of their workout (West, Guelfi, Simmock, & Jackson, 2017).

Clients might use different forms of motivation as they progress through the stages of exercise engagement (Teiceira, Carraça, Markland, Silva, & Ryan, 2012). Identified regulation is more prevalent during the initial stages of exercise engagement and is associated with short-term adoption of exercise; conversely, intrinsic regulation is more closely tied with long-term adherence to exercise. Autonomous motivation was found to be highest during the action and maintenance stages of engagement. This finding provides further evidence that clients are best served when they are oriented towards internalized forms of motivation for participating in exercise. Additionally, the researchers found that lack of motivation usually stems from two major causes: a lack of interest in exercise due to competing demands or feelings of incompetence due to not feeling fit or skilled enough. This suggests that motivational programs targeting exercise need to help clients identify barriers, find ways to overcome these barriers, and encourage clients to start at a level appropriate for their current fitness level rather than pushing to be at the same level as others.

Brunet & Sabiston (2009) examined the effect of interventions that decreased self-physique anxiety (distress over one's physical appearance) in

helping promote physical activity, reasoning that self-physique anxiety might be related to a lack of self-determined motivation. They proposed a pathway for the relationship between self-physique anxiety and motivational difficulties: self-physique anxiety negatively correlates with psychological needs; whereas, the ability to meet needs positively correlates with one's motivation to participate in physical activity. Therefore, by reducing self-physique anxiety, clinicians can assist clients in meeting their basic psychological needs and thereby increase motivation. After administering a survey questionnaire packet to 381 college-age students detailing exercise frequency, self-physique anxiety, and motivation, the authors found that the evidence supported this pathway and that physical activity can be promoted by specifically targeting self-physique anxiety.

Integrated model

Hagger, Chatzisarantis, & Harris (2006) introduced an integrated model of motivation that combines the theory of planned behavior and self-determination theory. The theory of planned behavior states that the intention to engage in behavior is the most proximal predictor of engagement in that behavior. In this model, higher autonomous motivation stems from the individual finding a behavior to be personally relevant and valued since it falls in line with their psychological needs. In such circumstances, the individual will have higher intention to engage in that behavior due to this higher autonomous motivation and, subsequently, be more likely to actually engage in the behavior. The proposed model accounted for 66.3% of variance in intention, as modeled by autonomous behavior, and showed a major effect for attitudes and perceived behavioral control.

Body Image and Exercise Motivation

Homan & Tylka (2014) examined whether exercise was positively correlated with positive body image in three realms: body appreciation (acceptance and appreciation of one's body), internal body orientation (how one's body feels as opposed to how they believe their body looks like to others), and functional body satisfaction (appreciation for what one's body can do). Additionally, the researchers wanted to discover if exercise frequency would be affected by appearance-based motivation (an external body orientation). Researchers found that exercise frequency was associated with higher positive body image, but that the relationship weakened with high level of appearance-based motivation. Another study demonstrated that past weight-stigmatizing experiences were associated with worse psychological well-being and higher controlled motivation (Pearl, Dovidio, Puhl, & Brownell, 2014). Furthermore, an association was made between avoidance behavior due to stigmatizing experiences and greater body dissatisfaction and drive for thinness. Exposure to weight-stigmatizing media is linked with a decreased desire to exercise, even when the individual is satisfied with their body image (Vartanian & Shaprow, 2008). As a result, researchers suggest de-emphasizing weight loss and appearance in motivational programs and instead focusing on positive body image.

Using technology for motivation

With the proliferation of technology in daily life, technology-based exercise programs may offer a pathway to increased motivation and support for patients not currently meeting recommended levels of physical activity. One study demonstrated

greater adherence to an exercise treatment in a sample with Type 2 diabetes when using a low-cost internet-based exercise intervention, compared to wait list and usual care conditions (Tate, Lyons, and Valle, 2015). The authors of the study suggest that utilizing social media may prove useful in getting clients physically active since it allows for increased social support while undergoing behavioral changes.

Computer-aided exercise games are useful for engaging sedentary patients in becoming more active; for example, through videogames such as *Dance Dance Revolution* and *Wii Sports*. A key feature of video games is their intrinsically motivating and goal-based nature (Yim & Graham, 2007). The rise of mobile gaming has helped popularize this form of motivation, since these games appeal to a broad audience and are effective at engaging an adult population due to the ease of access. Recently, the popularity of mobile game *Pokemon Go* led to a short-term boost in physical activity, offering a tool for helping clients participate in low-intensity exercise (Howe et al., 2016). Unfortunately, this was a transient boost in physical activity and most participants returned to baseline levels within six weeks. Yim & Graham (2007) delineate several key features for these types of games to boost participation in exercise: facilitate leadership for new players, create achievable short- and long-term goals, integrate music, avoid systematic barriers to forming groups, and actively assist players in forming groups. These features assist clients by boosting motivation through reducing potential embarrassment at not being "good enough", creating intrinsically-oriented rewards, and assisting players in satisfying social needs through exercise.

Motivational Pitfalls

Unfortunately, humans are not perfectly logical machines who efficiently make decisions on rational grounds. We are loaded with cognitive biases and emotional reactions that often cause us to make irrational decisions. Understanding how these motivational pitfalls affect clients in an exercising context may allow us to help them avoid the common reasons that exercise regimens are forgotten despite their best intentions.

Pre-feeling

In the book *Stumbling on Happiness*, Daniel Gilbert (2007) introduces the concept of pre-feeling—that experiences and memories are used to estimate emotional reactivity to future events. For example, based on a previous experience of enjoying pizza and beer with friends, an individual may pre-feel an enjoyable experience before accepting an invitation to eat pizza and drink beer at their friend's house. However, there's a major caveat to this concept: humans are notoriously poor predictors of what they will like or want in the future since predictions tend to be heavily skewed by current emotional status.

In one study, researchers asked individuals at the gym to imagine they were lost in the woods overnight without food or drink and predict whether the hunger or thirst would be more unpleasant (Van Boven & Loewenstein, 2003). The key group difference was the context in which subjects were asked to perform this act of imagination: half of the participants were asked before going on the treadmill (the non-thirsty condition) and the rest were asked after getting off the treadmill (thirsty condition). 92% of the participants in the thirsty condition reported that the thirst

would be more unpleasant than the hunger, compared to 61% in the non-thirsty condition.

Akin to the notion of pre-feeling is the concept of "affective forecasting." Affective forecasting asserts that in planning future actions people often are guided, in part, by the attempt to determine their affective response to future events (Wilson & Gilbert, 2005). However, as previously stated, people are heavily influenced by their current state when they make these types of predictions. For example, when asked how they would react to being diagnosed with a serious, chronic medical condition, participants report that they would be extremely unhappy (Ubel, Loewenstein, Schwarz, & Smith, 2005). However, although people with serious chronic conditions report an initial unhappy period, they will typically stabilize at a happiness level comparable to people without the condition.

Beginning exercisers should be wary of how pre-feeling and affective forecasting might impact their motivation in adopting a long-term exercise regimen, potentially causing them to dread exercise based on negative past experiences. For their first workout, people might create a negative experience through a combination of participating in exercises they do not enjoy doing or exercising at an intensity level that is too high for their baseline fitness. When contemplating exercising in the future, these people are more likely to assume that the gym will make them feel unpleasant and as a result choose not to return. The introductory stage of exercise should be done at a moderate intensity and with exercises enjoyable to the individual, as this is apt to create more positive experiences and

memories associated with exercise that will allow them to positively pre-feel exercise engagement.

Affect Heuristic

Present emotions influence our decision-making process as much as the memories of past emotions, as demonstrated through the affect heuristic (Jekauc, 2015). This heuristic speeds up cognitive processes by using emotions present in the moment to place values on an experience. If an individual is already in a bad mood, then the likelihood of engagement is decreased as the heuristic determines that they will downplay potential benefits. Conversely, positive affect and increased enjoyment can positively influence decision-making. Clients can be assisted in overcoming this heuristic by creating exercise plans to lessen the possibility of "in the moment" decisions.

Peak-end rule

Is it better to have a short and intense or to a long and mild exercise routine? The peak-end rule suggests that the longer duration would be more important for increasing motivation and adherence. This concept states that the emotional valiance of an experience is most heavily determined by the peak and end emotions surrounding it (Do, Rupert, & Wolford, 2008). Furthermore, the duration is not as vital to the memory of the event as its emotional intensity. Fredrickson and Kahneman (1993) demonstrated this finding in a study where they discovered that participants preferred when their hand was put in cold water (14°c**)** for sixty seconds followed by a short thirty second period in slightly warmer water (15°c) as

opposed to having their hand in just the cold water for sixty seconds, even though the experience was prolonged.

The phenomenon of the peak-end rule has also been found to apply in an exercise setting. When surveyed, participants state that they would prefer to exercise for a longer duration at a lower intensity rather than a shorter and harder exercise (Brewer, Manos, McDevitt, Cornelius, & Van Raalte, 2000). Similar to the cold water experiment, researchers found that participants who had a 5-minute period at a lower intensity at the end of a workout following a 15-minute higher intensity workout report a higher desire to change, i.e. exercise more, than participants who only do the 15-minute higher intensity workout (Parfitt & Hughes, 2000).

Present Bias

In the 1960's and 1970's, a group of researchers at Stanford constructed a sample experiment to test children's patience: put a marshmallow on the table, and, if they refrained from eating the treat for an extended period of time, they would be rewarded with an additional treat (Mischel, Ebbesen, & Raskoff, 1972). A portion of this sample had difficulty delaying gratification while others adopted a myriad of responses to delay an immediate pleasure in order to receive a greater future reward.

The famous Stanford Marshmallow Experiment perfectly demonstrated the present bias, wherein people give greater weight to a pay-off at the present time, such as eating the treat, as opposed to delaying gratification through knowledge of a greater reward in the future, such as gaining additional treats by waiting a short

period (O'Donoghue & Rabin, 1999). This may illustrate a common dilemma for clients considering incorporating exercise as part of their psychotherapeutic treatment. Cognitively, they might put greater value to the immediate pleasure of staying home and relaxing as opposed to going to the gym and reaping physical and mental health benefits down the line. Treatment plans that integrate exercise into traditional psychotherapy should be aware of this tendency and include techniques that can lessen the bias effect, such as encouraging accountability through workout partners.

A related cognitive bias is the concept of hyperbolic discounting, where the value of long-term rewards is minimized since the long-term gain is further in the future (Grüne-Yanoff, 2015). This bias explains why clients will give greater value to the immediate discomfort and time commitment associated with exercise than to the long-term health benefits they might accrue (Urminsky & Zauberman, 2017). Hyperbolic discounting may be especially prevalent for clients with disorders where long-term planning ability is already constrained, such as depression and ADHD.

Spotlight Effect

Before going to the gym, many people may be afraid of the negative judgment of others, for example of not being fit or competent enough. This fear stems from the spotlight effect, where people will assume that others are paying more attention to their actions than others realistically may be doing (Gilovich, Medvec, & Savitsky, 2000). This phenomenon is illustrated in an experiment by Gilovich, Kruger, & Medvec (2002), where participants played a video game and were asked to rate how much the other players were paying attention to their action. The results revealed

that the participants heavily discounted how much energy other people were dedicating to their own actions and overestimated the amount of energy they dedicated to paying attention to others' actions. Clients who express fears reminiscent of the spotlight effect should be educated about the potential manifestation of this phenomenon and thus made aware that it is unlikely other people will be monitoring their actions.

Extinction Burst

There have been countless stories of people who days after starting a new diet will binge on unhealthy foods. This common occurrence is best explained through extinction bursts, a behavioral reaction to stopping a behavior by temporarily increasing the prevalence of the undesired behavior (Vollmer, Ringdahl, Roane, & Marcus, 1997). Patients should be aware of this phenomenon when adopting an exercise routine and, if it occurs, the experience should be normalized to prevent patients from becoming discouraged or discontinuing the exercise routine.

Over-justification Effect

One major concern when creating any exercise program aimed at long-term retention is the elimination or minimization of external motivators, as external motivators decrease internal motivators' efficacy and may inadvertently cause patients to dislike an activity they originally enjoyed (Tang & Hall, 1995). This experience, labeled the over-justification effect, has been researched in a variety of settings and tends to show the same enjoyment reduction due to the participants now having an identifiable reason for doing the activity.

In an early study of motivation, researchers went into a school and divided the students into three conditions: those who have foreknowledge that they will be rewarded for each picture created; those who are rewarded but who were not told that they would receive a reward; and those who drew for fun without receiving a reward (Lepper, Greene, & Nisbett, 1973). At the end of the experiment, students in the "knowledge of payment" group reported much lower personal enjoyment from drawing than those in the other two conditions. Furthermore, it appears that foreknowledge of the reward stimulates a backlash, as the students who received a reward without prior knowledge did not suffer a reduction in enjoyment.

The key factor in this experiment appeared to be the knowledge of being rewarded, since the students in the "no knowledge of payment" group did not report any change in enjoyment. If external reinforcements are going to be used in an exercise-based treatment program, the reinforcements should come as a surprise to clients. Furthermore, research suggests reinforcements should be rewarded based on competency, rather than frequency, to best encourage clients to engage in the treatment (Rosenfield, Folger, & Adelman, 1980).

Ego Depletion

A key feature in maintaining any long-term, positive health change is the ability to exert self-control or willpower in service of that activity. However, research suggests that we have a limited pool of self-control and willpower that, when depleted, makes it much harder to engage in healthy behaviors, a process known as ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998). For example, participants told they are unpopular in a party situation ate twice as many

cookies compared to participants told they were “popular”. Creators of exercise-based treatment programs, especially those applied to patients with depression or anxiety, should be aware of how ego depletion might arise and make adjustments in order to schedule exercise at a time and situation where they are not as likely to have had their self-control reserves tapped out.

Exercise and Mental Health

Depression

In 2017, the World Health Organization stated that “depression is the leading cause of disability worldwide and is a major contributor to the overall global burden of disease.” The 12-month prevalence rate of Major Depressive Disorder (MDD) in the US is estimated at 6.7% of adults (Kessler, Chiu, Demler, & Walters, 2005) and 12.5% for adolescents aged 12- to 17-years old (Merikangas et al., 2010).

Depressed patients have lower amounts of social interaction and physical activity than their non-depressed peers; depression also has been identified as sharing numerous health risks with obesity, such as increased risk for Type 2 diabetes, cardiovascular disease, and premature death (de Wit et al., 2010).

The introduction of an exercise regimen compares favorably with antidepressants as a first-line treatment for mild and moderate depression and, when used in conjunction with medications, improve symptomology of the disorder (Brunet & Sabiston, 2009). Additionally, there is no significant difference in remission rates for patients treated with exercise as compared to second-generation antidepressants (Gartlehner et al., 2016). Not only were treatment outcomes for exercise-based treatment in patients with depression similar to those gained from

internet-based cognitive behavioral therapy and usual care, exercise also appears to reduce depression severity more quickly than usual care (Hallgren et al., 2016).

In the adolescent population, exercise has been shown to have a significant moderate-level effect on depressive symptoms and has been found to be equally effective for moderate and severe depression in both an inpatient and outpatient population (Carter, Morres, Meade, & Callaghan, 2016).

In addition to treating already-present depression, exercise appears to have a protective effect as well. Harvely and colleagues (2017) found that regular exercise was linked with decreased incidence of onset of a depressive episode and estimated that approximately 12% of future MDD cases could be prevented through an exercise regimen of only one hour per week. Among participants who did not exercise regularly, there was a 44% increased chance of developing depression as compared to the more active participants.

In a meta-analysis of twenty-five randomized control trials (RCTs) focusing on exercise's effect on MDD, researchers found a standardized mean difference of 1.11, a result suggesting a much higher improvement in symptoms when exercise is used as treatment for MDD compared to placebo (Schuch et al., 2016). Furthermore, the authors believed this effect size to be underestimated due to publication bias. Finally, numerous reviews support the efficacy of both aerobic and anaerobic exercises in treating depressive symptomology (Cooney, Dwan, & Mead, 2014; Adamson, Ensari, & Motl, 2015; Stanton & Reaburn, 2014).

Carek, Laibstain, & Carek (2011) propose three potential mechanisms of action to explain exercise's effect on depression. First, exercise increases brain-

derived neurotrophic factor (BDNF), a protein that helps keep neural cells healthy and functioning in addition to promoting new neuronal growth, which is important for combatting structural changes in the hippocampus, amygdala, striatum, and frontal cortex indicative of early onset depression. Second, exercise increases neurogenesis in the hippocampus, an area of the brain typically smaller in volume in depressed patients than in their non-depressed peers. Finally, exercise releases endocannabinoids, an endogenous form of the chemical compound cannabinoid, which promotes positive affect.

The evidence of a dosing effect is mixed for exercise's use as a form of treatment for depressive symptoms. Mata et al. (2012) found exercise programs with longer periods of activity and at higher intensities were linked with more positive affect in a sample of depressed patients. Additionally, positive affect increased more in MDD patients than the healthy control subjects and was greater after exercise than after a sedentary period. However, they also found that such forms of exercise have no impact on the negative affect found in depressed patients. Conversely, Harvey et al. (2017) found a treatment effect at low levels of exercise and regardless of intensity. In a meta-analysis, researchers concluded that exercise programs for depressed patients are most effective when conducted at a moderate intensity and when supervised by exercise professionals (Schuch et al., 2016).

Anxiety

In any 12-month period, anxiety disorders affect 18.1% of US adults (Kessler, Chiu, Demler, & Walters, 2005). Additionally, 25.1% of adolescents ages 13- to 18-years old are expected to develop an anxiety disorder (Merikangas et al., 2010).

There is considerably less research detailing exercise's effect on anxiety than on depression (Carek, Laibstain, & Carek, 2011), potentially due to the heterogeneous nature of anxiety disorders. However, exercise may still serve an important role in treatment plans for anxiety, especially since approximately 46.8% of patients with anxiety are overweight or obese (de Wit et al., 2010). Additionally, exercise is linked with reduced incidence rates for anxiety disorders (Ströhle, 2009) and lowers risk of anxiety in older populations (American College of Sports Medicine, 2009). Anxious clients typically demonstrate a temporary increase in psychological distress at the beginning of a workout but, ultimately, clients will finish with a positive psychological state and anxiety reduction when the workout is completed (Asmundson et al., 2013). Based on the current evidence, exercise may have an indirect, but important, influence on anxiety disorders.

Anderson & Shivakumar (2013) proposed several potential physiological mechanisms to explain improvements in anxiety symptomology. First, they suggested that exercise helps by lowering sympathetic nervous system (SNS) and hypothalamus-pituitary-adrenal (HPA) axis reactivity. A second proposed mechanism is through reducing serotonergic and noradrenergic levels in a manner similar to the mechanisms induced by many types of antidepressants. Third, exercise may help by increasing endogenous opioids levels; however, the authors note that anxiety reduction is present even if participants have taken an opioid antagonist. The fourth proposed mechanism is through increasing BDNF and eliciting neurogenesis in relevant neural areas, such as the hippocampus. Additionally, exercise may also increase clients' feelings of self-efficacy. Finally, the

researchers hypothesize that exercise might provide a distraction from anxiety. Alternatively, Asmundson and colleagues (2013) suggest exercise might decrease the strength of anxiety by exposing clients to the feared bodily state and demonstrating that these bodily sensations are not always a sign of eminent danger.

Bipolar disorder

Bipolar disorder affects 2.6% of adults in the United States in any given year (Kessler, Chiu, Demler, & Walters, 2005). Due to diagnostic criteria for the disorder, bipolar disorder is harder, and sometimes impossible, to definitively diagnose in children since it cannot be distinguished from other disorders (Merikangas et al., 2010). Patients with bipolar disorder who are physically active have reduced rates of depression, improved quality of life, and improved functioning compared to sedentary patients (Melo, Daher, Albuquerque, & de Bruin, 2016).

Cardiovascular exercise is associated with higher health-related quality of life in (HRQL) in patients with bipolar disorder, notable given that this community typically has significantly lower physical and mental HRQL, lower VO_2 max (a commonly used indicator of cardiovascular fitness) and are more sedentary than their peers who do not suffer from bipolar disorder (Vancampfort et al., 2017). In a meta-analysis of exercise interventions on patients with bipolar disorder, researchers found significant reductions in symptomology, improvements in functioning, reduced comorbidity, and improved neurocognition following 90 minutes of moderate-to-vigorous exercise per week (Firth, Cotter, Elliot, French, & Yung, 2015). Patients who exercised showed improvements in both quality of life and ability to cope with the disorder (Gorczynski & Faulkner, 2011).

Bipolar disorder is associated with numerous comorbid physical ailments, including increased incidence of obesity, Type 2 Diabetes, cardiovascular disease, weight gain (partly through increased appetite) facilitated by medication use, and stroke in addition to a higher prevalence of metabolic syndrome (Melo, Daher, Alburquerque, & de Bruin, 2016; Bauer et al., 2016; Keck & McElroy, 2003). Evidence suggests that the presence of these ailments negatively impacts the course of bipolar disorder and that exercise may help to reduce their prevalence (Melo, Daher, Alburquerque, & de Bruin, 2016). Exercise helps improve several notable health markers, including weight and blood pressure, as well as overall well-being in bipolar patients (Bauer et al., 2016). Of note, exercise has the potential to be a double-edged sword for this population since vigorous exercise might precipitate a manic or hypomanic episode (Thomson et al., 2015).

Schizophrenia

In any given year, schizophrenia affects approximately 1.1% of US adults (Kessler, Chiu, Demler, & Walters, 2005). Treatment outcomes for schizophrenia are typically poor, but exercise may prove an effective route to improving cardiometabolic symptoms, significant side-effects of antipsychotic medications that often go untreated in patients (Firth, Cotter, Elliot, French, & Yung, 2015). Furthermore, exercise has a significant effect on cardiovascular fitness and depressive symptoms in patients with schizophrenia, with a greater reduction in symptomology, depression, and need of care when compared to occupational therapy (Scheewe et al., 2013).

Since this population often has difficulty with stress, patients might specifically benefit from the stress reduction aspect of exercise. In one study, participants assigned to an exercise condition that included yoga and aerobic components showed reductions in state anxiety and psychological stress in addition to increased well-being after a single bout of exercise (Vancampfort et al., 2011). However, given that the results only analyzed the impact of a single session of exercise, this study's ability to speak to a meaningful impact on schizophrenia is limited. Exercise may also improve the negative symptoms characteristic of schizophrenia, a component of the disorder not typically targeted by antipsychotics (Gorczynski & Faulker, 2011).

Substance Use Disorder

Approximately 8.4% of adults in the United States are diagnosed with substance use disorder in any 12-month period (Center for Behavioral Health Statistics and Quality, 2015). Evidence suggests that being sedentary is associated with a higher prevalence of substance abuse in adults (Zschucke, Heinz, & Ströhle, 2012). Although evidence is mixed on how exercise might impact usage of different drug, it appears to reduce craving for alcohol and illicit drugs, to increase abstinence from illicit drugs, and to increase adherence with nicotine cessation (Zschucke, Heinz, & Ströhle, 2012). However, exercise might backfire on patients seeking to end nicotine use because it can cause patients to become overly stressed and start smoking again to reduce transient discomfort associated with exercise (Zschucke, Heinz, & Ströhle, 2012).

Attention-Deficit/Hyperactive Disorder

The 12-month prevalence for attention-deficit/hyperactive disorder (ADHD) in US adults is 4.1% (Kessler, Chiu, Demler, & Walters, 2005) and ADHD has a prevalence of 9% in adolescents ages 13 to 18 years old (Merikangas et al., 2010). Current treatment approaches to ADHD tend to be either pharmacological or behaviorally-based psychosocial interventions (Berwid & Halperin, 2012). Unfortunately, these interventions tend to produce only transient improvements in symptomology. Given that both types of interventions aim to increase BDNF, exercise might prove to be a valuable asset in reducing symptoms in patients with ADHD.

Berwid and Halpern (2012) demonstrated that children with ADHD participating in intense forms of aerobic exercise showed improved brain structure and function in relevant neural areas in addition to general cognitive improvements. In a sample of children with ADHD, a single 20-minute bout of exercise helped the children improve regulatory processes in addition to demonstrating greater response accuracy. (Pontifex et al., 2013).

Autism

Approximately 1 in 68 children is diagnosed with Autism Spectrum Disorder (ASD), a diagnosis that has seen a significant increase in diagnoses in recent years (Christensen et al., 2016). Most studies examining the relationship of exercise-based interventions on ASD have been focused on an adolescent population (Dillon, Adams, Goudy, Bittner, & McNamara, 2017). Impairments specific to ASD, such as low physical activity, poor nutrition, significant weight gain linked with medication use, and lack of awareness about long-term health consequences may compound the

increased obesity rate seen in adolescents (Srinivasan, Pescatello, & Bhat, 2014). Furthermore, school-aged children with ASD are less likely to be physically active than typically developing peers (Lang, Liu, & Ledbetter-Cho, 2018). Exercise-based treatments are an intervention that can dually combat the increased obesity prevalence and decrease symptomology for this disorder, especially since exercise is more cost effective than traditional behavioral interventions (Bremer, Crozier, & Lloyd, 2016).

Exercise-based interventions for ASD have been highly varied in terms of the type of exercise evaluated and have included such diverse activities as jogging, martial arts, and horseback riding (Bremer, Crozier, & Lloyd, 2016). Following exercise, children with ASD have shown improvements in stereotypic behaviors, social-emotional functioning, cognition, and attention, with the greatest improvements seen in stereotypic behavior and social-emotional functioning. However, it appears that being physically active results in a brief, about two-hour, reduction in stereotypic behavior (Lang, Liu, & Ledbetter-Cho, 2018). The greatest results were seen in those participating in horseback riding and martial arts.

Eating Disorders

Lifetime prevalence for the major eating disorders in adults is currently 0.6% for anorexia nervosa (AN), 2.8% for binge eating disorder (BED), and 0.6% for bulimia nervosa (BN) (Hudson, Hiripi, Pope, & Kessler, 2007). The lifetime prevalence for any eating disorder is 2.7% for adolescents ages 13- to 18-years old (Merikangas et al., 2010). Closely monitored and nutritionally supported exercise

may provide multiple benefits for patients with eating disorders, if a nutritional component is included as part of the program (Cook et al., 2016).

Exercise-based interventions must be used cautiously in this community given the commonality of driven exercise (DE) (Stiles-Shields, Bamford, Lock, & Le Grange, 2015), which is defined as exercise that is intense, compulsive in nature, and done with the sole purpose of influencing one's weight or image. Although DE is seen more prominently in bulimia nervosa, it is more predictive of worse treatment outcomes in anorexia nervosa (Stiles-Shields, Bamford, Lock, & Le Grange, 2015). This may be due to different constructs of exercise, and the needs it fulfills, within the context of the disorder.

Cook and colleagues (2016) detail eleven core themes that must be met for any exercise-based intervention targeting patients with eating disorders. These themes include the notion that the program involves a multidisciplinary team of experts; minimizes health risks; screens for exercise-related psychopathology; creates a written contract detailing the rules and goals for the intervention; includes a psychoeducational component; is focused on positive reinforcement; focuses on incremental growth; begins exercise at a mild intensity before capping at a moderate intensity; includes aerobic and resistance exercises tailored to specific needs; is nutritionally healthy; and includes a debriefing period to describe psychological state during exercise.

Clinical Implications

Given that the physical and emotional benefits of exercise are well known, clients' lives might be improved by implementing exercise-based interventions into

treatment plans for psychotherapy. As shown above, exercise is a viable treatment option for a range of mental health disorders. Unfortunately, the research is plagued with relatively high dropout rates, which minimize the results' generalizability. By focusing on the motivational processes underlining exercise engagement, we can learn how to best implement exercise programs into clinical treatment such that patients actually exercise and reap the associated benefits.

Chapter III: Methodology

This study first aimed to understand the motivational processes and strategies that facilitate people's ability to initiate and sustain a helpful exercise routine. The first phase of the research project focused on individuals actively exercising and sought to glean insight into the motivational strategies they use to continue a regular exercise regimen. The second phase was aimed at new gym-goers. It introduced people beginning to exercise to a psychoeducational program designed to help them sustain their motivation for exercise—in the face of the inertia and disappointments that often lead people to discontinue exercise after a short period. This psychoeducational program was informed by the existing literature as well as by results from the first phase of the study, and made use of common motivational processes and strategies to assist subjects in maintaining their behavioral change. The participants in the second phase were followed for a three-month period, with assessments taken at two timepoints (immediately after and three months following the intervention) to determine if being exposed to the psychoeducational intervention increased their exercise engagement. In addition, the assessments were also be used to gain a clearer picture of the motivational strategies the participants found most helpful. Finally, the study explored whether there was an association between increased depression and anxiety symptomology with types of motivation utilized and/or exercise retention. Participants at all phases were informed that the research project was oriented towards understanding the motivational processes underlining sustained exercise.

Research Design

During the first phase of this study, the researcher gathered information on motivational strategies utilized by current exercisers in order to both better understand what strategies are employed in real-world settings and the kind of strategies active individuals find motivating. A survey was created with four components: demographic information; a free response section; questions rated on a 5-point Likert scales; and ordinal questions. The free response section inquired into specific motivational strategies, and asked participants to discuss how they fit the strategies they use into their exercise routine. The questions were rated using Likert scales and looked into whether active exercisers are currently making use of motivational strategies outlined in the literature. Ordinal questions were used to gauge the frequency and intensity of people's exercise routine in order to undercover any existing relationships between the strategies people use and the amount of exercise they regularly sustain. Additionally, participants completed a brief mental health screener to determine the presence of depression and anxiety symptomology and, if present, their severity. The study gathered demographic information regarding subjects' age range, gender, previous mental health history, education level, socioeconomic status, and employment in order to test for any potential links between common demographic categories and strategies used.

The second phase of the project targeted individuals trying to adopt a regular exercise regimen. This group of participants was split into two groups: one introduced to a motivation psychoeducational program and a control group who received only the survey. Assessment of the controls and experimental groups were conducted at three months post-program completion to assess if the intervention

was successful in increasing adherence to a nascent exercise regimen. The psychoeducational component involved a pamphlet outlining various motivational strategies, as informed by the literature and first phase of the study. Both the experimental and control groups completed a survey assessing their current attitudes towards exercise, past attempts at exercise, likelihood of implementing motivational strategies, and goals for exercising. The survey was created with four types of measurements: free response sections; questions that involve providing ratings on a 5-point Likert scales; ordinal questions; and demographic information. Free response sections inquired into previous attempts to engage in exercise, attitudes toward exercise, and goals for exercise. The questions utilizing the five-point Likert scales assessed clients' likelihood of implementing specific motivational strategies. Ordinal questions gauged participants' current frequency and intensity of exercise. Additionally, participants completed a brief mental health screener to determine the presence of depression and anxiety symptoms and, if present, their severity. Demographic information queried age range, gender, previous mental health history, education level, socioeconomic status, and employment.

After three months, participants in the second phase were followed up with in a second survey evaluating retention rate, most utilized motivational strategies, and barriers that prevented adherence. This survey was comprised of ordinal scales, 5-point Likert scales, and free response sections. The ordinal scales aimed to understand the client's frequency and intensity of exercise. Likert scales were used to determine actual usage of specific motivational strategies from the psychoeducational pamphlet. Free response sections offered participants the

opportunity to describe in detail their barriers to exercising, other motivational strategies not previously covered, and attitudes toward continued or renewed engagement in exercise. Clients completed a brief mental health screener assessing depression and anxiety symptoms to determine if there has been any change in severity since the original assessment.

Participant Selection

Participants were recruited by placing physical flyers in gyms throughout California in addition to online postings on social media websites, including Facebook, Instagram, Twitter, and Craigslist. When placing notices on social media, attention was focused on groups and accounts that were more likely to cater to beginning exercisers, such as Couch to 5K programs. Participants were primarily located in Southern California, although participants also responded from throughout the United States. The researcher solely communicated with the participants through e-mail.

Inclusion criteria specified that participants be between 18 and 65 years old, meet exercise duration requirements for the study (had been exercising for 6 months in phase 1, had not been exercising for more than 6 months in phase 2), able to read and understand English, and were medically approved to exercise.

Exclusion criteria prohibited enrollment of individuals who hadn't met the exercise duration requirements, couldn't read and/or understand English, were under 18 years old or older than 65 years old, and/or had been medically advised against strenuous exercise

Instrumentation

Data were collected through three separate questionnaires at various time points: one for experienced exercisers that was completed prior to the construction of the questionnaire for Phase 2, one for new exercisers at the initial timepoint, and a third for new exercisers completed three month after completing the questionnaire at the initial timepoint.

Phase 1

The first stage was aimed at understanding the motivational processed utilized by regular exercisers. The researcher constructed a questionnaire (Appendix A) based on the research literature surrounding commonly utilized motivational strategies and potentially relevant demographic information. Additional instruments included several validated instruments including: the Generalized Anxiety Disorder 7-item (GAD-7) scale (Spritzer, Kroenke, Williams, & Lowe, 2006; Appendix D) to assess anxiety severity, Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, Williams, & Löwe, 2010; Appendix E) to assess depression severity, Exercise Benefits/Barriers Scale (EBBS; Sechrist, Walker, & Pender, 1987) to determine participants' expectations for benefits and barriers in exercise, and Motives for Physical Activity Measurement-Revised (MPAM-R; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997) to assess participants' motivation in exercising.

Phase 2

The questionnaire (Appendix B) in the pre-intervention phase assessed attitudes and goals towards exercise and motivational strategies for new exercisers. The researcher constructed the questionnaire based on the research literature, potentially relevant demographic information, and data obtained from the

questionnaire at the first phase. Additional instruments included several validated instruments including: the Generalized Anxiety Disorder 7-item (GAD-7) scale (Spritzer, Kroenke, Williams, & Lowe, 2006; Appendix D) to assess anxiety severity, Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, Williams, & Löwe, 2010; Appendix E) to assess depression severity, Exercise Benefits/Barriers Scale (EBBS; Sechrist, Walker, & Pender, 1987) to determine participants' expectations for benefits and barriers in exercise, and Motives for Physical Activity Measurement-Revised (MPAM-R; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997) to assess participants' motivation in exercising.

Phase 3

The third phase's questionnaire (Appendix C) was constructed based on the research literature, included potentially relevant demographic information, and included the same motivational processes as the second phase's questionnaire. Additional instruments included several validated instruments including: the Generalized Anxiety Disorder 7-item (GAD-7) scale (Spritzer, Kroenke, Williams, & Lowe, 2006; Appendix D) to assess anxiety severity, Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, Williams, & Löwe, 2010; Appendix E) to assess depression severity, Exercise Benefits/Barriers Scale (EBBS; Sechrist, Walker, & Pender, 1987) to determine participants' expectations for benefits and barriers in exercise, and Motives for Physical Activity Measurement-Revised (MPAM-R; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997) to assess participants' motivation in exercising.

Exercise Benefits/Barriers Scale

The EBBS converts responses into a unitary score, which reflects how positively the individual perceives exercise. Additionally, it contains subscores for both perceived benefits and perceived barriers.

Motives for Physical Activity Measure-Revised (MPAM-R)

The MPAM-R is divided into five separate subscores which reflect different sources of motivation for exercise: finding the act of exercise enjoyable in itself (interest), a desire to be physically healthy (fitness), a desire to become more physically attractive (appearance), wanting to become more skilled in the activity (competence), and using exercise as a way to connect with friends and meet new people (social).

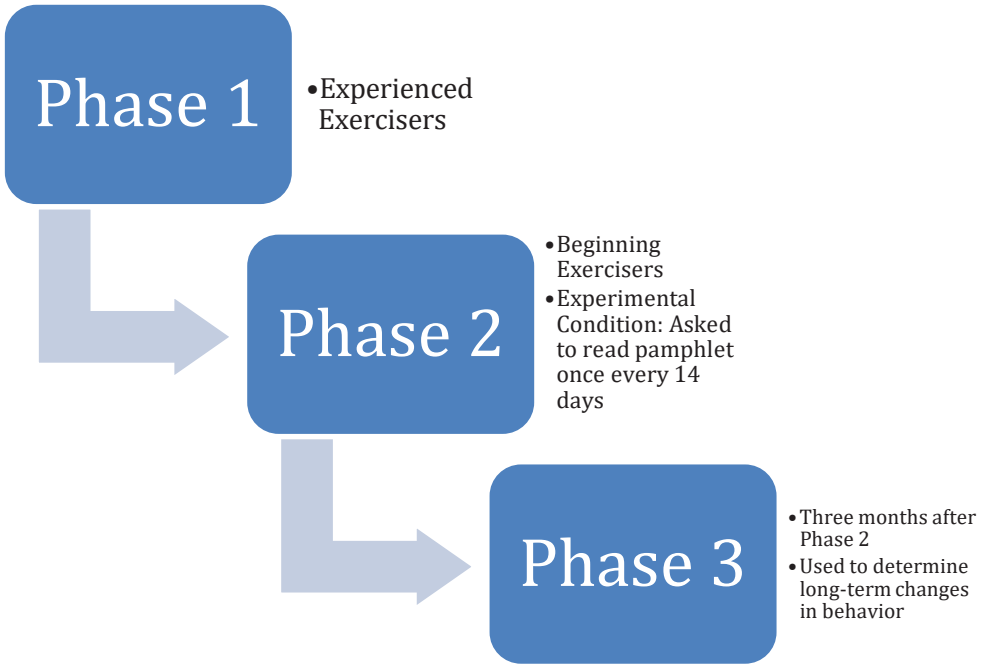
Procedure

Questionnaires were constructed and completed through Google Forms, a secure web-based survey platform that enabled participants to confidentially respond and have their identities protected.

Individuals interested in participating emailed the researcher to be screened for eligibility in the designated phase of the study. For the second phase, all eligible participants were randomly placed, through a standard lottery method, in either the psychoeducational condition or control condition. Participants in the psychoeducational condition were required to read the psychoeducational pamphlet and consent to reviewing the information at least once every two weeks between timepoints before beginning the survey. Biweekly reminders were sent out to participants reminding them to review the materials. Participants in the control condition did not receive the psychoeducational component and received only the

survey. Eligible participants were sent a link to the survey, which they were asked to complete within 14 days. Participants in the second phase of the study were assigned an identification number that was used to link data at baseline and during the follow-up. At the completion of the survey, participants had the opportunity to provide their email addressed to be entered into a raffle for a $25 Amazon gift card as compensation. At all stages of the study, participants received periodic reminders if they had not completed the survey within 10 days of receiving the survey link.

Figure 1
Timeline of Study



Data Processing Techniques

Free response answers were analyzed for themes by the researcher and coded for motivational strategies, barriers to engagement, and specific goals noted by the participants. Themes identified in the first phase of the study, such as

motivational strategies, informed the construction of the psychoeducational component of the second phase. The second phase focused on the difference between the experimental condition and control condition regarding participants' perception of barriers to exercise engagement.

Quantitative responses in the second phase were analyzed using paired t-tests that compared the differences between the experimental and control conditions, with specific attention given to types of motivational strategies used, frequency of exercise, and intensity of exercise. Additionally, a χ_2 test was conducted to determine if there was any significant difference in motivational reasons for exercising and/or strategies used based on depression and anxiety severity. Finally, a Pearson's correlation test was done on major motivational areas in relation to benefits and barriers to understand how they may have interacted across research factors.

Ethical Considerations

There was minimal harm potential for participants in the study since the study was entirely voluntary and participants were not asked to exercise at any level above what they were capable. Informed consent was obtained from participants before they began the questionnaires. Given the potential negative affect that can arise from exercise, such as shame or guilt if goals are not met, standard language was implemented into the informed consent detailing the potential for becoming upset and how to contact local, low-/no-cost mental health resources. Participants' confidentiality was ensured by separating identifying information from the data. Consent forms can be found in Appendices H and I.

Chapter IV: Results

Data from the study were analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 23.0. Statistical analyses were completed to answer the research goals delineated in chapter 1, including the types of motivation used, correlations of motivational strategies based on perceived barriers and benefits, and mood symptomology with motivational strategies. Additionally, free-responses were analyzed and coded to determine how experienced exercisers perceived and interacted with their primary motivators.

Phase 1 Participants

The sample for the first phase of the study was comprised of 32 individuals (n=32). Demographic variables served as a control variable in the statistical analysis. Of those who completed the survey, 12 were male (37.5%) and 20 were female (62.5%). The majority of respondents were White (n=20, 62.5%), while the remainder of the sample identified as Black (n=2, 6.3%), Asian (n=5, 15.6%), multiracial (n=3, 9.4%), or other (n=1, 3.1%), with one respondent preferring not to list their race. Of these 32 respondents, 3 identified as Hispanic/Latino (9.4%). The mean age of respondents was 39 years old (m=39, SD=12), with a range between 20 and 64 years old. Respondents tended to be highly educated, with over half having a Bachelor's degree or higher (see Table 1 below). Finally, as shown in Table 2, the majority of respondents were employed full-time.

Table 1
Educational Information for Participants in Phase 1

Degree	n	Percentage of Sample
High School or high school equivalent	1	3.1%
Some college	3	9.4%
Associate's Degree	4	12.5%
Bachelor's Degree	13	40.6%
Master's Degree	10	31.3%
Doctorate or Professional Degree	1	3.1%

Table 2
Employment Information for Participants in Phase 1

Employment Status	n	Percentage of Sample
Full-Time	17	53.1%
Part-Time	6	18.8%
Unemployed	2	6.3%
Student	2	6.3%
Self-Employed	4	12.5%
Retired	1	3.1%

Phase 1 Results

Pearson's Correlation Coefficients were calculated to determine if there were any associations between scores on the EBBS, MPAM-R, GAD-7, PHQ-9, demographics, and the frequency and duration of participants' exercise in a week. Several significant correlations were found, including between interest in exercise and striving for competence (r=.783, p=.000), interest in exercise and motivated for physical appearance (r=.458, p=.008), interest in exercise and general fitness (r=.690, .000), aiming for competency and motivated for physical appearance (r=.568, p=.001), aiming for competency and motivated for general fitness (r=.829, p=.000), appearance-based motivation and general fitness-based motivation (r=.795, p=.000), and gender and number of days with vigorous exercise (r=-.449, p=.010). In addition to these, several other relevant correlations were found, as seen in Table 3. Of note, there were no significant associations between scores on the GAD and PHQ in connection with perception of exercise or types of motivators.

Table 3
Correlations for Experienced Exercisers

Associated Scores	Pearson's r	Significance
Competence and Social	.413	.018*
Appearance and Social	.449	.010**
Fitness and Appearance	.442	.016*
Fitness and Education Level	.404	.022*
Interest and Competence	.783	.000**
Interest and Appearance	.458	.008**
Interest and Fitness	.690	.000**
Social and Education	.352	.048*
Competence and Appearance	.568	.001**
Competence and Fitness	.829	.000**
Gender and Days of Vigorous Exercise	-.449	.010**
GAD and PHQ	.778	.000**

*=p<.05, two-tailed
**=P<.01, two-tailed

In addition, participants were provided free-response sections to discuss and expand upon their motivators and what they use to increase motivation during times where they struggle to find motivation to engage in exercise. Responses were analyzed and coded to find common themes and motivators. Popular motivators noted by participants were to improve physical health (n=16, 50%), lose or maintain weight (n=15, 46.9%), improve mental health (n=10,31.25.3%), maintaining general fitness (n=9, 28.1%), working towards a goal (e.g., running a marathon; n=8, 25%), improving their appearance (n=8, 25%), enjoyment of the activity in itself, (n=5, 15.6%), and the ability to enjoy food without guilt (n=5, 15.6%).

Phase 2 Participants

The second phase of the study was comprised of two separate groups: an experimental group that received a psychoeducational pamphlet detailing motivational techniques derived from the literature and a control group which did not receive the psychoeducational material. Participants were randomized using a standard lottery system. There were twenty participants (n=20) in the experimental conditions and 15 participants (n=15) in the control condition. In the experimental condition, two of the participants were male (n=2, 10%) and eighteen were female (n=18, 90%). In the control condition, two were male (n=2, 13.3%) and thirteen were female (n=13, 86.7%). Both the experimental (n=16, 80%) and the control (n=11, 73.3%) conditions were predominately White. Non-white participants in the experimental condition included four Black participants (n=4, 20%). In the control condition, there were two Black participants (n=2, 13.3%), one Asian participant (n=1, 6.7%), and one who preferred not to note their racial identity (n=1, 6.7%). Of these participants, two in the experimental condition (n=2, 10%) and two in the control condition (n=2, 13.3%) identified as Hispanic/Latino. The mean age of respondents in the experimental condition was 36.2 years old (m=36.2, SD=10.7), with a range between 21 and 58 years old. In the control condition, the mean age was 40.8 (m=40.8, SD=13.2) with a range between 23 and 65 years old. Both the experimental and control conditions tended to be highly educated, with over half the respondents in each condition possessing a Bachelor's Degree or higher, as seen in Table 4. Additionally, over half of the respondents in the experimental conditions

and about a third of the participants in the control condition were employed full-time, as shown in Table 5.

Table 4
Educational Level for Phase 2

	Experimental		Control	
Degree	n	%	n	%
High school or high school equivalent	0	0%	1	6.7%
Some college	3	15%	2	13.3%
Associate's Degree	2	10%	1	6.7%
Bachelor's Degree	7	35%	6	40%
Master's Degree	4	20%	3	20%
Doctorate or Professional Degree	4	20%	2	13.3%

Table 5
Employment Information for Phase 2

	Experimental		Control	
Employment Status	n	%	n	%
Full Time	13	65%	5	33.3%
Part Time	1	5%	4	26.7%
Unemployed	2	10%	1	6.7%
Self-Employed	2	10%	2	13.3%
Student	2	10%	2	13.3%
Retired	0	0%	1	6.7%

Phase 2 Results

To ensure that there were not any major differences between the groups prior to the intervention, a between-groups t-test was conducted. Outside of PHQ (t=2.406, p=.037) and GAD (t=4.884, p=.001) scores, there were no significant differences between the groups.

A Pearson's Correlation was calculated for each condition to determine possible correlations between perceived benefits and barriers and motivators.

There were several significant correlations in the pre-intervention, experimental condition between how positively participants perceived exercise and fitness as a motivator (r=-.528, p=.017), perceived benefits (r=.935,p= .000), perceived barriers (r=-.655, p=.002), and exercising for the joy of exercising in itself (r=-.646, p=.002). Additionally, correlations existed between several types of motivators, such as interest and sociability (r=.558, r=.011), competence and fitness (r=.528, p=.017), perceived benefits and sociability (r=-.628, p=.003), and interest and fitness (r=.587, p=.006). Furthermore, there were several significant correlations between what caused participants to abandon previous exercise regimen, motivational strategies they expected to use for their current regimen, perception of exercise, and motivators for exercise, which can be seen in Table 6.

Table 6

Significant Correlations for Experimental Condition, Baseline

Associated Factors	Pearson's r	Significance (2-tailed)
Not enough time and perceived benefits	-.554	.011*
Financial Concerns and perceived barriers	-.508	.022*
Feeling terrible after exercise and perceived barriers	-.454	.044*
Feeling terrible during exercise and perceived barriers	-.739	.000**
No one to exercise with and perceived barriers	-.726	.000**
Focusing on health over weight loss and time concerns	.491	.028*
Feeling self-conscious and setting realistic goals	-.491	.020*
Focusing on health and feeling self-conscious	-.521	.019*
Trying a variety of exercise and financial concerns	-.568	.009**
Feeling terrible during exercise and focusing on concrete goals	-.456	.043*
Feeling terrible during exercise and trying different exercises for enjoyment	-.470	.037*
Positive perception of exercise and working out with a group	-.331	.016*

Positive perception of exercise and a regular schedule	-.451	.046*
Positive perception of exercise and trying different exercises aiming for enjoyment	-.628	.003**
Positive perception of exercise and participating in a variety of exercises	-.447	.048*
Perceived barriers and having concrete goals	.456	.043*
Perceived barriers and a regular schedule	.577	.008**
Perceived barriers and trying different exercises aiming for enjoyment	.524	.018*
Perceived exercise and exercising for fulfillment	.455	.044*
Perceived barriers and creating realistic goals	.511	.021*
Perceived benefits and exercising in a group	-.568	.009**
Perceived benefits and trying different exercises aiming for enjoyment	-.535	.015*

*=p<.05
**=p<.01

By comparison, there were relatively few correlations seen in the control condition at the first time point. Significant correlations included perceived benefits and exercising for enjoyment (r=-.676, p=.006), perceived barriers and failing previous attempts to not seeing results quickly enough (r=-.641, p=.010), and a positive perception of exercise and exercising because of general enjoyment (r=-.535, p=.040).

A chi-square analysis was conducted to determine if there were any major variables that were markedly different between conditions. Participants in the experimental condition were more likely to endorse "Because I want to improve existing skills" (χ_2=11.72, p=.039) whereas participants in the control conditions were more likely to endorse "Because I want to define my muscles to look better." (χ_2=12.03, p=.034)

Both conditions provided free-responses which allowed participants to discuss contributing factors to previous failed attempts to initiate an exercise regimen, previous experience with psychotherapy, primary reasons for exercising, secondary reasons for exercising, current fitness goals.

Exposure to Psychotherapy

In the experimental condition, the sample was evenly split between individuals that had previously received psychotherapy (n=10, 50%) and those who had not (n=10, 50%). Of those with previous exposure to psychotherapy, 70% of them had individual therapy (n=7), 20% had engaged in couples therapy (n=2), 20% of them were psychologists themselves (n=2), 10% had gone through an intensive outpatient program (n=1), and 10% had participated in family therapy (n=1). Specific treatment targets noted included trauma (n=2, 20%) and substance use (n=1, 10%).

In the control condition, the majority of the sample had not been previously involved in psychotherapy. Of the 15 participants in this condition, 6 reported being previously exposed to psychotherapy (n=6, 40%). Participants with previous exposure were primarily connected with individual psychotherapy (n=5, 83.33%),

with one participant noting previous hospitalization in an inpatient program (n=1, 16.67 %). Treatment targets included trauma work (n=2, 33.33%), substance abuse (n=1, 16.67%), and grief following a divorce (n=1, 16.67%).

Primary reasons to exercise

At both time points, participants were provided the space to identify their primary reasons for wanting to begin an exercise regimen.

When asked at the first time point, participants from both conditions reported a range of primary motivators that inspired them to begin their exercise regimen. In the experimental conditions, participants primarily listed weight (n=7, 35%), general health reasons (n=4, 20%), and general fitness (n=2, 10%). Participants in the control condition similarly listed weight (n=4, 26.67%) and general health (n=3, 20%) as their primary motivators.

Secondary Motivators for Exercise

In addition to primary motivators, participants were assessed for secondary motivators that contributed to their drive for initiating a new exercise regimen.

Participants were initially asked to list their secondary motivators for initiating an exercise regimen at the first time point. Secondary reasons noted by participants in the experimental condition included: weight (n=3, 15%), general health (n=3, 15%), greater confidence (n=3, 15%), physical appearance (n=2, 10%), and improving muscle tone (n=2, 10%). In comparison, participants in the control condition primarily listed improving self-esteem (n=4, 26.67%), appearance (n=3, 20%), increasing energy (n=3, 20%), improving endurance (n=2, 13.33%), general health (n=2, 13.33%), and mental health (n=2, 13.33%).

Reasons Previous Regimens Were Abandoned

The vast majority of both the experimental (n=18, 90%) and control (n=14, 93.3%) had previously attempted to start an exercise regimen that they had failed to maintain. Participants were queried on why they abandoned previous attempts to initiate a new exercise routine. Those with previous failed attempts in the experimental condition noted perceived lack of time (n=7, 38.89%), a drop in motivation (n=6, 33.33%), family obligations (e.g., caretaking, parenting, etc.; n=4, 22.22%), a change in their daily routine (n=3, 16.67%), boredom (n=2, 11.11%), lack of a concrete goal (n=2, 11.11%), an injury (n=2, 11.11%), accessibility to proper facilities (n=2, 11.11%), and seasonal changes (n=1, 5.56%) as the primary causes of abandoning the routine. Participants in the control condition attributed the reasons they abandoned previous regimens to many of the same causes as the experimental condition: perceived lack of time (n=5, 35.71%), physical injury (n=4, 28.57%), lack of motivation (n=3, 21.43%), mental health (e.g., depression, anxiety, etc.; n=2, 14.29%), pregnancy (n=1, 7.14%), weather (n=1, 7.14%), and access to a regular facility (n=1, 7.14%).

Goals

Participants were offered the opportunity to discuss any concrete goals they were aiming to achieve. In the experimental condition, participants' goals included: finishing a specific event (e.g., half marathon; n=6, 30%), losing a specified amount of weight (n=6, 30%), increasing muscle tone (n=2, 10%), learning to use the machines at the gym (n=1, 5%), increasing endurance (n=1, 5%), reaching a specific mile time (n=1, 5%), and increasing variability in their routine (n=1, 5%).

Comparatively, participants in the control condition noted finishing a specific event (n=3, 20%), consistency in their exercise routine (n=3, 20%), increasing strength (n=3, 20%), reaching a goal weight (n=2, 13.33%), increasing flexibility (n=2, 13.33%), improving appearance (n=1, 6.67%), and increasing endurance (n=1, 6.67%) as goals.

Phase 3 Results

Participants were contacted again three months after they completed the initial survey to participate in a second survey oriented towards understanding the retention of new exercise regimen, motivational factors, depressive symptoms, anxiety symptoms, and, in the experimental condition, use of motivational strategies. From the experimental condition, 11 (n=11) of the original 20 participants completed the second survey (retention rate=55%). In the control condition, 14 (n=14) of the original 15 participants completed the second survey (retention rate=93.33%).

Phase 3 Participants

Of the 11 participants that completed the second survey in the experimental condition, 10 of them identified as female (90.9%) and 1 identified as male (9.1%). The age range in this sample was between 26 and 29 years old (m= 39.81, SD=11.38). The majority of the sample was White (n=9, 81.8%), with the remaining participants identifying as Black (n=1, 9.1%) and Iberian (n=1, 9.1%). Additionally, one participant in the sample identified as Hispanic or Latino (n=1, 9.1%). The sample tended to be highly educated, with the majority of participants possessing a

Bachelor's degree or higher (as seen in Table 7). Additionally, as seen in Table 8, participants were largely employed full-time.

Of the 14 participants that completed the second survey in the control condition, 11 identified as female (78.6%) and 3 identified as male (21.4%). The age of the sample ranged between 25 and 65 years old (m=42.71, SD=12.66). The sample was predominately White (n=11, 78.6%), with 2 participants identifying as Black (n=2, 14.3%) and 1 participant identifying as Asian (n=1, 7.1%). None of the participants identified as being of Hispanic or Latino descent. As seen in table 7, the majority of participants were highly educated and possessed a college education. The majority of the sample was employed, with an equal number of full-time and part-time employees, as seen in Table 8.

Table 7
Education Information for Participants in Phase 3

	Experimental		Control	
Degree	n	%	n	%
High school or equivalent	0	0%	1	7.1%
Some college	1	9.1%	2	14.3%
Associate's Degree	1	9.1%	1	7.1%
Bachelor's Degree	4	36.4%	5	35.7%
Master's Degree	3	27.3%	3	21.4%
Doctoral or Professional Degree	2	18.2%	2	14.3%

Table 8
Employment Information for Phase 3

	Experimental		Control	
Employment Level	n	%	n	%
Full-time	9	81.8%	4	28.6%
Part-time	1	9.1%	4	28.6%
Unemployed	0	0%	2	14.3%
Self-Employed	0	0%	1	7.1%
Student	1	9.1%	2	14.3%
Retired	0	0%	4	28.6%

Correlations

Pearson's Correlation Correlations were calculated for each condition at the second time point.

In the post-intervention, experimental condition, there were several notable, significant correlations between relevant factors. The most significant associations were between a positive perception of exercise and incorporating exercise as a component of their identify ($r=-.736$, $p=.01$) and between using exercise for personal fulfillment and constructing realistic goals for their fitness ($r=.867$, $p=.001$). Additional correlations for participants in the second experimental condition at the second time point can be found in Table 9.

Table 9
Correlations for Experimental Condition, Follow-Up

Associated factors	Pearson's r	Significant (2-tailed)
Positive perception of exercise and exercise as part of identity	-.736	.010**
Personal fulfillment from exercise and creating realistic goals	.867	.001**
Fitness-related motivators and perceived benefits	-.677	.022*
Perceived barriers and exercise as part of identity	.622	.040*
Perceived barriers and a regular schedule for exercising	.693	.018*
Perceived barriers and number of days exercising	.656	.029*
Exercising in a group and exercise as part of identity	.640	.034*
Exercising as part of a group and minutes of exercise	.652	.030*
Different exercises for enjoyment and a regular schedule	.618	.043*
Different exercises for enjoyment and mins of exercise in a session	.683	.020*
Different exercises for variety and days of exercise in a week	.617	.043*
Different exercises for variety and a regular schedule	.677	.022*
Regular schedule and days of exercise per week	.730	.011*
Regular schedule and minutes of exercise per session	.701	.016*

*=p<.05

**=p<.01

There were multiple correlations found in the control condition at the second time point as well. Significant correlations were found between positive perception and appearance as a motivator (r=-.550, p=.042), perceived benefits and exercising for enjoyment (r=-.538, p=.047), perceived benefits and appearance as a motivator (r=-.553, p=.040), and perceived benefits and sociability as a motivator (r=-.661, p=.010). Additional correlations for this condition can be found in Table 10.

Table 10
Correlations for the Control Condition, Phase 3

Associated factors	Pearson's r	Significant (2-tailed)
Motivated by enjoyment and motivated by appearance	.878	.000**
Motivated by enjoyment and motivated by fitness	.794	.001**
Motivated by enjoyment and motivated by sociability	.726	.003**
Positive perception of exercise and motivated by appearance	-.550	.042*

Perceived benefits and motivated by enjoyment	-.538	.047*
Perceived benefits and motivated by appearance	-.553	.040*
Perceived benefits and motivated by sociability	-.661	.010**
Motivated by appearance and motivated by fitness	.904	.000**
Motivated by appearance and motivated by sociability	.716	.004**
Motivated by feelings of mastery and motivated by appearance	.536	.048*
Motivated by feelings of mastery and motivated by fitness	.579	.030*

*=p<.05
**=p<.01

Primary Motivators for Exercise

Responses at the second time point appeared to similarly reflect the responses at the first time point. In the experimental condition, the most popular motivators continued to be focused primarily on weight (n=5, 45.45%) and general

fitness (n=3, 27.27%). In contrast, participants in the control condition reported having no primary motivator (n=4, 28.57%), striving for increased endurance (n=3, 21.43%), or aiming to increase their strength (n=3, 21.43%).

Secondary Motivators for Exercise

By the second time point, participants in both conditions appeared to have slightly shifted their secondary motivators for exercising. In the experimental condition, participants noted general physical health (n=5, 45.45%), improved confidence (n=2, 18.18%), and weight (n=2, 18.18%) as secondary motivators. In comparison, participants in the control condition noted a wider range of secondary motivators, including: improving confidence (n=4, 28.57%), appearance (n=3, 21.43%), general physical health (n=3, 21.43%), weight (n=2, 14.29%), and improving physical strength (n=2, 14.29%).

Group Differences

As previously stated, the conditions were compared using a between-group t-test at the first time point to determine if there were any relevant group differences. At that time, the only major differences were scores on the PHQ (t=2.406, p=.037) and the GAD (t=4.884, p=.001). An independent between-group t-test was calculated again at the second time point to determine any group differences that could be attributed to the intervention. Participants in the experimental condition (m=83.45, SE=3.48) perceived exercise more positively than participants in the control condition (m=71.86, SE=4.06; mean difference=11.60, t=2.10, p=.05). Outside of this, there no significant differences between the groups at the second time point,

including differences between types of motivation, days they exercise, or minutes per session.

Additionally, a chi-square analysis was conducted to determine if there were any motives listed in the MPAM-R that were different between the two group beyond pure chance. Participants in the experimental conditions were more likely to endorse "Because I want to keep up my current skill levels" (χ^2=12.52, p=.028), "Because I want to have more energy" (χ^2=11.66, p=.040), "Because I want to improve my cardiovascular fitness," (χ^2=12.66, p=.027) and "Because I want to maintain my physical strength to live a healthy life." (χ^2=11.07, p=.05).

Differences in the Conditions between Time Points

Finally, a within-group t-test was calculated for both condition between the time points. Significant correlations for the experimental condition can be found in Table 11 below. The only major significant difference in this condition were for scores on the GAD (t=2.406, p=.037) and PHQ (t=4.884, p=.001).

Table 11
Experimental Condition Correlations Across Time

Variable	Pearson's r	Significance (2-tailed)
Perceived benefits of exercise	.622	.04*
Motivated by enjoyment and interest	.793	.004**
Motivated by appearance	.735	.010**
Motivated by fitness	.643	.033*
Motivated by sociability	.698	.017*
Minutes per workout session	.651	.030*

*=p<.05
**=p<.01

Comparatively, the only major differences in the control group between time points were for being motivated by appearance (t=3.409, p=.005) and days of exercise (t=3.015, p=.010). Correlations between the time points can be found in Table 12 below.

Table 12
Control Condition Correlations Across Time

Variable	Pearson's r	Significance (2-tailed)
Positive perception of exercise	.558	.038*
Perceived barriers	.732	.003**
Exercising for interest or enjoyment	.817	.000**
Exercising for appearance	.788	.001**
Exercising for fitness	.683	.007**
Exercising for sociability	.885	.000**
PHQ score	.697	.006**

*=p<.05
**p=<.01

Hypotheses

Several hypotheses were formulated prior to the start of the study. Unfortunately, most of the hypotheses were not met.

The first hypothesis was that a psychoeducational pamphlet aimed at motivating nascent exercisers would increase exercise engagement in exercisers

after three months. The first sub-hypothesis was not supported by the data as exercisers in the experimental condition at the second time point did not report any significant differences in the number of days or minutes per session in relation to the control condition. The second sub-hypothesis similarly did not hold up as there were not any significant differences in motivating factors for the experimental condition between time points.

The second hypothesis was that participants with elevated depressive and/or anxious symptoms would benefit from exposure to a psychoeducational pamphlet after three months. The first two sub-hypotheses, that participants with depressive and anxious symptoms would utilize different motivational factors and would increase exercise engagement between time points, were proven false as there were no significant correlations with PHQ or GAD scores with motivational factors at any time points. Additionally, there were no significant improvements in exercise engagement between time points for the experimental condition, even when considering PHQ and GAD scores. However, the third sub-hypothesis was validated, as there was a significant reduction in depression and anxiety symptoms for participants in the experimental condition between time points that was not similarly reflected in the control condition.

The third hypothesis held that motivational strategies utilized by experienced exercisers in the first phase may highlight additional information that went beyond the known scientific literature. Although most of the noted motivations were previously reflected in the literature, such as focusing on a goal or exercising for enjoyment, one motivational strategy commonly endorsed that had

not previously appeared in the literature: exercising in order to enjoy food without guilt.

Chapter V: Discussion and Conclusion

This mixed method study sought to gain a greater understanding of the motivational underpinnings surrounding a regular exercise routine and to determine if a brief psychoeducational intervention underlining these motivational strategies would help sustain a nascent regimen. Although the intervention did not appear to have increased the duration or frequency of exercising compared to a control condition, the experimental condition demonstrated a significant reduction in scores on depression and anxiety inventories. Open-ended responses in all phases revealed additional information about motivators for exercise, causes for past failed attempts to initiate a routine, and what goals, if any, beginning exercisers were aiming to achieve.

Flyers detailing the study was posted in several gyms in the Southern California region in order to recruit participants. In addition, postings were made on several websites, including Facebook, Craigslist, and Twitter.

In the first phase of the study, which surveyed exercisers who had established routines, a total of 32 participants responded to the survey. The most significant correlations discovered were between major areas of motivation. Results showed that perceiving exercise as an enjoyable activity in itself was significantly correlated with almost every other area of motivation, including competence, appearance, and general fitness. Additionally, being motivated by appearance and a desire for the social component of exercise were highly connected. The results did not indicate any connection between perceptions of exercise and motivational factors. Additionally, there were not any correlations between scores on the GAD

and PHQ with motivational factors or perception of exercise. The most popular responses on the free response portions indicated that participants in this condition were primarily motivated by improving their physical health, losing weight, achieving mental health benefits, working towards a goal (e.g., running a half marathon), and improving appearance. This stands in contrast to literature, which demonstrated poor exercise adherence when exercise was primarily motivated by appearance and weight (Homan & Tylka, 2014; Vartanian & Shaprow, 2008; Pearl, Dovidio, Puhl, & Brownell, 2014). The only motivator listed by exercisers that was not previously covered by the literature was a desire by some participants to exercise in order to eat what they wanted without guilt.

The second and third phases of the study were focused on understanding the motivations of beginning exercisers and understanding if a brief psychoeducational intervention would increase adherence to a nascent exercise routine. At the first time point, a total of 35 participants responded and completed the survey, which was split between 20 participants in the experimental condition and 15 participants in the control condition. Of the initial set, 11 of the participants from the experimental condition and 14 of the participants from the control condition responded to the follow-up survey. Although it is not uncommon for retention rates to be low in a study focused on exercise, it was curious that the retention rate was significantly higher in the control condition as compared to the experimental condition. This may be explained by participants in the experimental condition feeling shame or guilt over not regularly complying with the intervention, the extra requirement of reading a pamphlet, and avoiding the second survey as a way to

ameliorate that negative affect. Alternatively, the participants who did not complete the survey at the second time point may have had increased anxious and/or depressive symptomology that inhibited their motivation to engage in a second survey.

Pearson's Correlation Coefficients were calculated to determine connections between motivations behind exercise and perceptions of exercise.

It was found that the more a participant in the experimental condition perceived a barrier to exercise, the more likely they were to feel terrible during exercise, perceive a lack of people to exercise with, and report difficulty adopting a regular schedule. Additionally, participants who saw financial concern as a barrier to exercise were less likely to view the benefit of trying a variety of exercises in order to find one which they found enjoyable. However, the more positively individuals perceived exercise, the more likely they were to be interested in trying a range of exercises in order to find one where they found intrinsic pleasure. In comparison, there were relatively few correlations in the control condition at this point, with the main two correlations being an interaction between perceived benefits and exercising for enjoyment in addition to perceived barriers and abandoning previous attempts to start exercising regularly due to not seeing results quickly enough. These results suggest that people who positively perceive exercise are more likely to focus on exercise as a pleasurable activity rather than a means to an end.

The primary motivators for both groups at the first time point appeared to be focused on losing weight and improving general health. At this stage, motivators

appeared to be vague and focused more on generalities as opposed to being oriented towards specific goals. Secondary motivators identified by participants included weight loss, increased confidence, improving their appearance, increasing self-esteem, and increased energy. These results likely adequately reflect the primary motivators for beginning exercisers, as weight and general health concerns are likely to be the principal cause for people who are not already active to adopt a regimen.

Participants were also surveyed on what contributed to failed past attempts at initiating an exercise regimen. Primary causes specified by participants included a perceived lack of time, a decrease in motivation to continue the regimen, family obligations that limited their ability to engage in a regular routine, a physical injury that impaired them from being physical, and a change in their daily routine (e.g., a new job) that compromised their ability to manage a regular exercise regimen. This indicates the potential for additional factors worth considering when assisting a client to initiate an exercise routine beyond simple lack of motivation, including helping them to address time management, finding ways to incorporate exercise into a caregiver's schedule, and understanding the psychological and physical state of a former exerciser rehabilitating from an injury.

Finally, participants were asked to detail what goals, if any, they had with their exercise regimen. Popular goals identified by participants included finishing an event (such as a half marathon or an Iron Man competition), losing a specified amount of weight, finding consistency in their exercise routine, and increasing their physical strength.

Participants were sent a follow-up survey three months after they completed the initial survey to discover if the intervention increased exercise adherence and decreased depressive and anxious symptoms. While the vast majority of the control condition completed the second survey, only slightly more than half of the participants in the experimental condition responded to the survey. Although low retention rates are common in exercise-centered research, the much higher retention rate in the control condition suggests that there may have been factors in the experimental population that contributed to a poorer response rate. It's possible participants in the experimental condition who responded only to the first survey may possess fundamental traits that would impact the results, such as experiencing guilt from not regularly engaging with the intervention, despite previous commitment to do so, or they may have already abandoned their regimen.

Similar to the first time point, a Pearson's Correlation Coefficient was calculated between perception of exercise, strategies for maintaining an exercise routine, and categories of motivation. In the experimental condition, it was found that the more positively participants perceived exercise, the more likely they were to incorporate exercise as part of their identity. Additionally, there was a correlation between using exercise for personal fulfillment and constructing realistic goals to maintain their routine. In comparison, participants in the control condition were more likely to associate the benefits of exercise by being motivated by the appearance and sociability of exercise.

At the second time point, participants in the experimental condition identified primary motivators as losing weight and general health. An increase in

confidence was a commonly endorsed secondary motivator for this sample. In comparison, participants in the control condition were primarily motivated by reaching a certain goal (e.g., finishing a marathon) or increasing strength. Interestingly, several participants in the control condition at this time point were unable to identify a primary motivator. Increasing confidence, improving appearance, and improving general health were identified as secondary motivators.

At the second time point, participants in the experimental condition tended to view exercise more positively than those in the control condition. However, there were no noticeable differences between groups on types of motivation used, number of days per week exercised, or average minutes spent per exercise session. Additionally, a chi-square test was calculated to determine if there were any group differences on specific motivators, with significant group differences identified for wanting to maintain current skill level, wanting to have more energy, improving cardiovascular fitness, and maintaining physical strength to have a healthy life.

Finally, a within-group t-test was calculated to determine if there were changes in the condition between time points. It was found that within the experimental condition, the primary change at the second time point was a reduction in scores on the GAD and PHQ. These results indicate that, although the intervention may not have influenced the frequency or duration of exercise routines, it appeared to have a positive effect on ameliorating anxiety and depression. By comparison, the main difference for the control group at the second time point was that there was an increase in appearance-based motivation and in number of days per week in which they exercised.

Limitations

This study had multiple limitations, which may adversely affect the ability to generalize the results to a general population.

First, the sample size was small, with a combined 25 individuals completing the survey at the second time point. Although this is not uncommon in research on exercise, it does introduce the possibility of results occurring due to pure chance rather than because of the active effects of an intervention. A larger sample size would allow for greater confidence in the results found by significantly decreasing the impact of outliers within the sample and significant findings occurring through pure chance.

Second, participants in the study were self-selected, as they were already in situations that exposed them to recruitment, in addition to demonstrating enough motivation to email the researcher in order to be screened. As such, participants may have had a higher baseline of motivation to exercise as compared to the general population.

Third, the geographic range for participants may adversely impact the ability to generalize these results, as most participants resided in the United States and the vast majority of physical postings for recruitment were placed at gyms in Southern California. Participants exposed to the physical postings may have had different motivations for exercise when compared to people who do not visit gyms or individuals in other areas of the country or other countries.

Fourth, the intervention required that participants regularly interact with a psychoeducational pamphlet without an extrinsic motivator to do so. As such, it's

possible that participants in the experimental condition did not regularly engage with the psychoeducational material and those who did may have been more intrinsically motivated in general.

As stated earlier, there was a relatively low retention rate in the experimental condition at the second time point. The retained participants may have had a higher baseline of motivation for exercise as compared to those that did not complete the second survey. It is unknown whether the non-responders may have felt guilty for not reading the psychoeducational material, or whether they may have already abandoned their exercise routine, either of which could have significantly impacted the results.

Given that a portion of the study was focused on the impact of exercise on mental health, it is important to note that participants were gathered from a general population as opposed to a clinical population. As such, the results may not adequately reflect the impact of the intervention on a clinical population or illuminate the motivational factors which would benefit them.

The majority of the sample in this study identified as White. The generalizability of the results to minority populations is impaired as there may be additional cultural factors that impact how individuals perceive and are motivated to exercise.

The participants in this study were highly educated, with over half of the participants possessing a Bachelor's degree or higher. This may indicate that the participants were more characterologically and intrinsically motivated than less educated peers. Furthermore, they may have an easier time understanding the more

complicated concepts in the pamphlet than someone with a high school or lower education.

Finally, the sensitivity of the instruments used may have impacted the results. When assessing the frequency and length of exercise regimens, categorical, rather than continuous, variables were utilized. As such, a degree of sensitivity may have been lost that would impact the results. Additionally, for the mental health screener, brief instruments were utilized that covered the basics of symptoms for anxiety and depression. If more extensive instruments had been utilized, results could have divulged additional information on how motivation for exercise interacts with mental health. Furthermore, since only depression and anxiety symptoms were assessed, information concerning the efficacy of the intervention on additional mental health diagnoses cannot be gleaned from the results

Implications

Although the intervention did not appear to have an effect on the frequency or duration of exercise, it appeared that it positively impacted participants by improving their perception of exercise and alleviating depressive and anxious symptoms. As such, patients in psychotherapy experiencing difficulty with depression and anxiety may benefit from utilizing the psychoeducational pamphlet to alter perceptions of exercise and manage their symptoms without the aid of, or in addition to, psychotropic medications.

However, the results also indicate that the knowledge of motivational strategies that can help sustain an exercise regimen is not enough to further the regimen beyond those who had not received information about these strategies.

Given that the knowledge of exercise's benefits does not appear to influence the number of Americans regularly meeting exercise guidelines, more extensive interventions may be required to sustain and motivate a beginning exerciser.

Recommendations

Exercise continues to be an activity that fewer Americans are regularly engaging in, perhaps because they require additional motivation to initiate and sustain a regular exercise routine. However, simple knowledge does not appear to be adequate in actually maintaining routines during the beginning stages. Future research may examine the impact of more intensive interventions, such as introducing ways of establishing accountability and more elaborate discussions about motivational strategies, in sustaining these routines.

Given the need for people to find the form of exercise in which they find fulfillment and enjoyment, it may be enlightening to understand the motivational factors underlining different types of exercises. For example, the motivational strategies that drive runners may be fundamentally different from those that empower yogis or weightlifters.

People fall out of exercise for a myriad of reasons. One of the major reasons listed by participants in this study was returning to a regimen after recovering from a physical injury. Future research examining the unique psychological features of this population, understanding the challenges they face from returning to their regimen, and implanting motivational strategies to dissuade negative feelings stemming from being at a different physical state than they were prior to the injury

may help to understand how to assist that population in sustaining an exercise routine.

Another reason that people identified that past regimens failed was due to caretaking responsibilities and the impact that barrier has on maintaining a regular exercise routine. Additional research would benefit from identifying the unique attributes of this population and understanding how to incorporate the challenges of caretaking with adopting a new exercise regimen. This population may benefit from learning how to incorporate the identity of both a caretaker and exercise in sustaining a regular exercise routine. Additionally, exercise facilitates which provide additional accommodations for caregivers, such as childcare services, may help support beginning exercisers in maintaining new regimens.

The method and medium of the psychoeducation may hold an important key to increasing exercise adherence. Increasing the method of delivery for future psychoeducation may improve adherence to a new exercise regimen. Specifically, focusing future psychoeducational material into audio-visual and more interactive settings might allow individuals to gain a greater understanding for the material discussed through increased interaction with the material.

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Appendix A

First Phase Questionnaire

Section 1: Demographic Information

What is your identification number?
Free Response

What is your gender?
Male
Female
Other (Please Specify)
Prefer Not to Say

What is your age?
Free Response

What is your marital status?
Married
Widowed
Divorced
Separated
Never Married

What is the highest degree of education you have received?
Less than a high school degree
High school degree or equivalent (e.g., GED)
Some college
Associate Degree
Bachelor Degree
Masters degree
Doctoral or Professional Degree (e.g., PhD, JD, MD)

What is your race?
White
Black or African-American
American Indian or Alaskan Native
Asian
Native Hawaiian or other Pacific Islander
Multi-racial
Other (Please Specify)
Prefer not to say

Are you of Hispanic and/or Latino descent?
Yes

No
Prefer not to say

What is your current employment status?
Full-time employment
Part-time employment
Unemployed
Self-employed
Student
Retired

What is your approximate average yearly household income?
$0-$24,999
$25,000-$49,999
$50,000-$74,999
$75,000-$99,999
$100,000-$124,999
$125,000-$149,999
$150,000-$174,999
$175,000-$199,999
$200,000 or more

Section 2: Motivators

What is the primary reason you exercise? (e.g., "To lose weight")
Free Response

What are secondary reasons you exercise? (e.g., "I have extra energy")
Free response

How do you motivate yourself to exercise on days where you feel like you don't want to?
Free response

Section 3: Motivators/Barriers

MPAM-R Scale
See Ryan, Frederick, Lepes, Rubio, & Sheldon (1997)

EBBS
See Sechrist, Walker, & Pender (1987)

Section 5: Frequency of exercise

How many days per week do you do 30 minutes or more of moderate exercise (e.g., going on walks, biking to work, etc.)?
0-1
2-3
4-5
6-7

On days where you do 30 minutes or more of moderate exercise, approximately how long are you doing moderate exercise on average?
30-60 minutes
2 hours
3 hours
4 hours or more

How many days per week do you do 30 minutes or more of vigorous exercise per week? (e.g., running, lifting weights, etc.)
0-1
2-3
4-5
6-7

On days where you do 30 minutes or more of vigorous exercise, approximately how long are you doing vigorous exercise on average?
30-60 minutes
2 hours
3 hours
4 hours or more

Section 6: Mental health screener

GAD-7
See Appendix D

PHQ-9
See Appendix E

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Appendix B

Second Phase Questionnaire

Section 1: Demographic Information

What is your gender?
Male
Female
Other (Please Specify)
Prefer Not to Say

What is your age?
Free Response

What is your marital status?
Married
Widowed
Divorced
Separated
Never Married

What is the highest degree of education you have received?
Less than a high school degree
High school degree or equivalent (e.g., GED)
Some college
Associate Degree
Bachelor Degree
Masters degree
Doctoral or Professional Degree (e.g., PhD, JD, MD)

What is your race?
White
Black or African-American
American Indian or Alaskan Native
Asian
Native Hawaiian or other Pacific Islander
Multi-racial
Other (Please Specify)
Prefer not to say

Are you of Hispanic and/or Latino descent?
Yes
No
Prefer not to say

What is your current employment status?
Full-time employment
Part-time employment
Unemployed
Self-employed
Student
Retired

What is your approximate average yearly household income?
$0-$24,999
$25,000-$49,999
$50,000-$74,999
$75,000-$99,999
$100,000-$124,999
$125,000-$149,999
$150,000-$174,999
$175,000-$199,999
$200,000 or more

Do you have any history being in therapy?
Yes
No

If yes, can you briefly explain the extent of your experience?
Free response

Section 2: Exercise experiences

What is the primary reason you want to start exercising? (e.g., "To lose weight")
Free Response

What are secondary reasons you want to start exercising? (e.g., "To have more confidence")
Free response

Have you tried to begin an exercise routine prior to now?
Yes
No

If yes, what caused you to stop? (e.g., "I had difficulty finding time to go to the gym")
Free response

On a scale of 1 to 5, where 1 means "Not at all" and 5 means "All the time", how much did the following contributed to you stopping prior exercise attempts:
Not enough time
Financial concerns
Feeling self-conscious
Not seeing results fast enough
Felt terrible during exercise
Felt terrible after exercise
No one available to exercise with
Stressed out from other areas of life

If there was another contributing factor not listed above, please list them here:
Free response

Section 3: EBBS

See Sechrist, Walker, & Pender (1987)

Section 4: MPAM-R

See Ryan, Frederick, Lepes, Rubio, & Sheldon (1997)

Section 5: Feelings towards specific strategies (ONLY experimental group)

On a scale of 1 ("Definitely not going to use it") to 5 ("Definitely going to use it"), rate how likely you are to use the following motivational strategies outlined in the earlier pamphlet:

Exercising as part of a group
Aiming towards a concrete goal (e.g., running a half marathon)
Trying different exercises to find out which one I enjoy best
Trying different types of exercises for variety
Focus on personal fulfillment rather than external factors
Creating realistic goals
Incorporating exercise as part of my personal identity
Focusing on general health rather than weight
Creating a regular schedule for exercise that I will follow
Starting at a moderately difficult level for my level of fitness
Employing technology as part of my exercise routine (e.g., Fitbit to connect with friends, Pokémon Go, etc.)

Section 6: Expectations for exercise

How many days per week do you expect to exercise?
0-1 days

2-3 days
4-5 days
6-7 days

How many days per week do you want to exercise?
0-1 days
2-3 days
4-5 days
6-7 days

How many minutes do you plan on exercising during an average exercise sessions?
0-15 minutes
16-30 minutes
31-45 minutes
46-60 minutes
61-90 minutes
91-120 minutes
More than 120 minutes

Do you currently have any goals in exercise? If so, what are they?
Free response

Section 7: MH screener

PHQ-9
See Appendix E

GAD-7
See Appendix D

Created by Reed Vierra, 2019

Appendix C

Third Phase Questionnaire

Section 1: Exercise Frequency/Intensity

How many days per week do you do 30 minutes or more of moderate exercise (e.g., going on walks, biking to work, etc.)?
0-1
2-3
4-5
6-7

On days where you do 30 minutes or more of moderate exercise, approximately how long are you doing moderate exercise on average?
30-60 minutes
2 hours
3 hours
4 hours or more

How many days per week do you do 30 minutes or more of vigorous exercise per week? (e.g., running, lifting weights, etc.)
0-1
2-3
4-5
6-7

On days where you do 30 minutes or more of vigorous exercise, approximately how long are you doing vigorous exercise on average?
30-60 minutes
2 hours
3 hours
4 hours or more

Section 2: Technique utilization (ONLY experimental group)

On a scale of 1 ("Never use it") to 5 ("Always use it"), rate how likely you are to use the following motivational strategies outlined in the pamphlet:

Exercising as part of a group
Aiming towards a concrete goal (e.g., running a half marathon)
Trying different exercises to find out which one I enjoy best
Trying different types of exercises for variety
Focus on personal fulfillment rather than external factors
Creating realistic goals
Incorporating exercise as part of my personal identity

Focusing on general health rather than weight
Creating a regular schedule for exercise that I will follow
Starting at a moderately difficult level for my level of fitness
Employing technology as part of my exercise routine (e.g., Fitbit to connect with friends, Pokémon Go, etc.)

Section 3: EBBS
See Sechrist, Walker, & Pender (1987)

Section 4: MPAM-R
See Ryan, Frederick, Lepes, Rubio, & Sheldon (1997)

Section 5: Continued barriers/Other motivational techniques/ Attitudes (FR)

On a scale of 1 to 5, where 1 means "Not at all" and 5 means "All the time", how much did the following cause you to chose not to exercise:
Not enough time
Financial concerns
Feeling self-conscious
Not seeing results fast enough
Felt terrible during exercise
Felt terrible after exercise
No one available to exercise with
Stressed out from other areas of life

Section 6: Mental Health Screener

GAD-7
See Appendix D

PHQ-9
See Appendix E

Created by Reed Vierra, 2019

Appendix D

Generalized Anxiety Disorder 7-Item (GAD-7) Scale

All questions are given a score between 0-4 based on responses of "Not Sure at All", "Several Days", "Over half the days", and "Nearly every day".

Over the last 2 weeks, how often have you been bothered by the following problems:

1. Feeling nervous, anxious, or on edge

2. Not being able to stop or control worrying

3. Worrying too much about different things

4. Trouble relaxing

5. Being so restless that it's hard to sit still

6. Becoming easily annoyed or irritable

7. Feeling afraid as if something awful might happen

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not Difficult at All, Somewhat difficult, very difficult, extremely difficult

Source: Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of Internal Medicine, 166(10), 1092-1097. doi: 10.1001/archinte.166.10.1092.

See Appendix J: Permissions

Appendix E

Patient Health Questionnaire-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

Responses are rates between 0-3 points. Available responses include “Not at all”, “Several days”, “More than half the days”, and “Nearly every day”.

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or stay asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual
9. Thoughts that you would be better off dead or of hurting yourself in some way

If you have checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all
Somewhat difficult
Very difficult
Extremely difficult

Source: Kroenke, K., Spitzer, R. L., Williams, J. B., & Löwe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: a systematic review. General Hospital Psychiatry, 32(4), 345-359. doi: 0.1016/j.genhosppsych.2010.03.006

See Appendix J: Permissions

Appendix F

Consent Form for First Phase of Study

Study Title: Exercise and Motivation

Principal Investigator: Reed Vierra, M.A.
rvierra@antioch.edu

I am a student at Antioch University, Santa Barbara in the Doctorate of Psychology program. This form has important information about the reason for doing this study, what we will ask you to do if you decide to be in the study, and the way we would like to use information about you if you choose to be in the study.

Why are you doing this study?

The purpose of this study is to determine what motivational strategies are used by people currently exercising to increase dedication to their exercise regimen. At the end of this study, I hope to have a greater understanding of real-life strategies used to inform a second study aimed at improving motivation in beginning exercisers, specifically targeting individuals with depression and anxiety.

What will I do if I choose to be in this study?

You will be asked to:

- Provide demographic information
- Discuss specific motivational strategies you utilize
- Discuss how you incorporate these strategies into your exercise regimen
- Answer questions about your usage of motivational strategies outlined in literature
- Answer questions about the intensity and frequency of your exercise regimen
- Complete a brief mental health screener

Study time: Study participation will take approximately 20-45 minutes

I may quote your remarks in presentations or articles resulting from this work. If this happens, all identifying information will removed.

What are the potential risks or discomforts?

To the best of our knowledge, the things you will be doing will have no more risk of harm than you would experience in everyday life.

As with all research, there is a chance that the confidentiality of the information we collect from you could be breached—we will take steps to minimize the risk, as detailed in detail below in this form.

What are the potential benefits for me or others?

You are not likely to have any direct benefit from being in this research study. This study is designed to learn more about motivating people to exercise. The study results may be used to help other people in the future.

How will you protect the information you collect about me, and how will the information be shared?

Results of this study may be used in publications and presentation. Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used.

To minimize the risk to confidentiality, I will be coding and encrypting all data results, removing identifying information, and limiting access to study records.

We may share the data we collect from you for use in future research studies. If the data we collect about you is shared, any information that could identify you will be removed.

If we thank that you intend to harm yourself or others, we will notify the appropriate people with this information.

Financial Information

Participation in this study will invoke no cost to you. After completing the survey, you will have the opportunity to enter a drawing for an Amazon gift card. You are not required to enter the drawing. If you chose to enter the drawing, contact information will be removed from your survey responses.

What are my rights as a research participant?

Participation in this study is voluntary. If, at any time and for any reason, please feel free not to. You may withdrawal from this study at any time, and will not be penalized in any way for deciding to stop participating.

Who can I contact if I have questions or concerns about this research study?

If you have any questions, you may contact the researcher at:

Reed Vierra

rvierra@antioch.edu

Consent

I have read this form and the research study has been explained to me. I have been given the opportunity to questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above.

Appendix G

Consent Form for Second and Third Phase Participants

Study Title: Exercise and Motivation

Principal Investigator: Reed Vierra, M.A.
rvierra@antioch.edu

I am a student at Antioch University, Santa Barbara in the Doctorate of Psychology program. This form has important information about the reason for doing this study, what we will ask you to do if you decide to be in the study, and the way we would like to use information about you if you choose to be in the study.

Why are you doing this study?

The purpose of this study is to determine if a motivational program will help new exercisers maintain their exercise regimen. At the end of this study, I hope to have a greater understanding of what motivational strategies are useful for sustaining exercise regimens for different groups.

What will I do if I choose to be in this study?

You will be asked to:

- Provide demographic information
- Read a pamphlet of research-backed motivational strategies at least once every two weeks **(for psychoeducational condition only)**
- Answer questions about your usage of motivational strategies
- Answer questions about the intensity and frequency of your exercise regimen
- Complete a brief mental health screener

Study time: Study participation will take approximately 20-45 minutes (40-90 minutes total) for each time the survey is completed. The second survey will come about two months after you finish the first survey.

I may quote your remarks in presentations or articles resulting from this work. If this happens, all identifying information will removed.

What are the potential risks or discomforts?

To the best of our knowledge, the things you will be doing will have no more risk of harm than you would experience in everyday life.

However, it is understood that beginning exercising can bring forward uncomfortable emotions. If this occurs, you may contact the researcher to receive information for contacting local low-cost mental health services.

As with all research, there is a chance that the confidentiality of the information we collect from you could be breached—we will take steps to minimize the risk, as detailed in detail below in this form.

What are the potential benefits for me or others?

One potential benefit from participating in this study is being able to increase personal motivation and be better able to stick with your new exercise regimen. The study results may be used to help other people in the future in starting a new exercise routine.

How will you protect the information you collect about me, and how will the information be shared?

Results of this study may be used in publications and presentation. Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used.

To minimize the risk to confidentiality, I will be coding and encrypting all data results, removing identifying information, and limiting access to study records.

We may share the data we collect from you for use in future research studies. If the data we collect about you is shared, any information that could identify you will be removed.

If we thank that you intend to harm yourself or others, we will notify the appropriate people with this information.

Financial Information

Participation in this study will invoke no cost to you. After completing the survey, you will have the opportunity to enter a drawing for an Amazon gift card. You are not required to enter the drawing. If you chose to enter the drawing, contact information will be removed from your survey responses.

What are my rights as a research participant?

Participation in this study is voluntary. If, at any time and for any reason, please feel free not to. You may withdrawal from this study at any time, and will not be penalized in any way for deciding to stop participating.

Who can I contact if I have questions or concerns about this research study?

If you have any questions, you may contact the researcher at:

Reed Vierra
rvierra@antioch.edu

Consent

I have read this form and the research study has been explained to me. I have been given the opportunity to questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above.

Appendix H

Permissions

PHQ-9 and GAD-7

QUESTIONS REGARDING DEVELOPMENT, ACKNOWLEDGMENTS AND USE

The PHQ family of measures, including abbreviated and alternative versions as well as the GAD-7, were developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc.

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