

THE DIFFERENCES IN PROGRESS THROUGH
STAGES OF CHANGE IN EXERCISE BEHAVIOR
BETWEEN COLLEGE STUDENTS WITH AND
WITHOUT PEER MENTORS

By

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CHAPTER I

INTRODUCTION

“An ounce of prevention is worth a pound of cure” (Benjamin Franklin).

Physical health is a topic widely publicized in our society. The benefits of exercise have been presented to our population through a variety of methods. The research that has been conducted on exercise behaviors leads to questions about what is necessary for people to incorporate exercise into their lives on a regular basis.

The United States has experienced a dramatic shift in causes of death over the past century. Chronic diseases, such as heart disease and cancer, have overtaken infectious diseases as the leading killers in this country (Dunnagan, Haynes, & Smith, 2001). Lifestyle choices have a tremendous influence on the prevalence of chronic diseases and can include use of tobacco, use of alcohol, diet, and exercise participation. Lifestyle factors have been credited with over 50% of the causes of death due to preventable disease (Lalonde, 1974). Exercise has been found to significantly decrease many risk factors associated with chronic diseases that plague our society. Hence, this study focuses on exercise behaviors.

Exercise has been shown to positively affect physical and psychological well-being. US Surgeon General Reports have supported moderate, regular physical activity for both adults and children in the maintenance of health status and high quality of life (US Department of Health and Human Services, 1996). The benefits of exercise to health

and well-being have been promoted by the United States government policies, in the workplace, community centers, schools, universities, and a variety of other environments. The US Surgeon General reported physical benefits of exercise in decreasing risk for cardiovascular disease, colon cancer, osteoarthritis, and osteoporosis (US Department of Health and Human Services, 1996). Research has also looked at the effects of exercise on psychological variables such as anxiety, depression, suicidal thoughts, drug use, relationships with parents and peers, self-esteem, self-concept, and academic performance (Asci, 2002; Field, Diego, & Sanders 2001a&b).

The theory most widely used by researchers in looking at exercise behaviors has been the transtheoretical model. The transtheoretical model can be applied in a manner that is effective in facilitating activity and, in turn, providing the many benefits that come with exercise. The transtheoretical model has been used in many areas related to human behavior change, such as smoking cessation, substance abuse, diet modification, and exercise (Prochaska, DiClemente, & Norcross, 1992). This model argues that individuals progress through stages of change and that movement across the stages is cyclic rather than linear. This model argues that different interventions and information need to be tailored to match the particular stage an individual is in at the time. The five stages include: 1) Precontemplation, 2) Contemplation, 3) Preparation, 4) Action, and 5) Maintenance. During the precontemplation stage, individuals do not intend to start exercising in the next six months. The contemplation stage includes people that seriously intend to exercise within the next six months. The preparation stage includes people that are exercising, but not on a regular basis. The action stage involves regular exercise (three or more times a week for 20 minutes or longer) for fewer than six months. The

maintenance stage includes individuals that exercise on a regular basis for more than six months.

Research has found support for matching intervention strategies to the stage of change for exercise behavior (Marcus, Banspach, Lefebvre, Rossi, Carlton, & Abrams, 1992). When there is a mismatch between the intervention and stage of change, attrition is high. An example of this mismatch would be focusing on maintenance strategies for an individual in the contemplation stage. For example, maintenance strategies are meant to help incorporate variety to prevent boredom. One intervention would be to encourage the individual to practice a more intrinsic approach through focus on the process rather than the outcome for exercise. Strategies for the contemplation stage might involve helping the individual through a cost-benefit analysis in making decisions about exercise. Motivational strategies would be a more appropriate intervention to decrease dropouts in contemplation stage with the example given above. Thus, adherence is improved by matching treatment strategies to an individual's stage of change.

Marcus and colleagues (1992) studied 610 adult participants in a six-week program designed to increase physical activity. The intervention consisted of stage-matched self-help materials. At the conclusion of the intervention, 30% of the participants in the contemplation stage at the baseline and 61% of those in the preparation stage progressed into the action stage. Additionally, 31% of the participants in the contemplation stage progressed into the preparation stage. Four percent of those in the preparation stage and 9% of those in the action stage regressed. This study supports the proposition that matching the intervention to an individual's stage of change may increase exercise adherence behaviors.

The stages of change characterize when people change, but the processes of change have to do with how people change. The two categories of processes are cognitive and behavioral. One researcher (Rosen, 2000) has shown that processes of change used by individuals in relation to exercise differ from those employed in programs involving smoking cessation, substance abuse, and diet change. People who are exercising use cognitive processes more frequently during action and maintenance phases when compared to the other phases. The hypothesis is that if people continually think about exercising, then they are more likely to participate in a regular exercise routine. Examples of cognitive processes include consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, and social liberation. Behavioral processes can include counter-conditioning, helping relationships, reinforcement management, self-liberation, and stimulus control.

Consciousness raising could involve recalling information people have given the individual on the benefits of exercise. An example of dramatic relief would be warning the person about health hazards of inactivity to evoke an emotional response. Environmental reevaluation could involve feeling like a better role model for others if the individual exercised on a regular basis. Self-reevaluation involves considering how regular exercise can help one to be a healthier and happier person. Social liberation includes examining how society is changing in ways to make it easier for exercisers.

Five examples of behavior processes were also introduced by Rosen (2000). Counterconditioning could involve the individual utilizing the message, "Instead of remaining inactive, I engage in some physical activity." Helping relationships can be any person in the individual's life that can provide assistance when problems with exercise

are encountered. Reinforcement management involves the individual rewarding himself or herself after exercising. Self-liberation can be the individual using the phrase “I am free to keep exercising if I want to.” The final example, stimulus control, entails putting cues around the individual’s environment to remind him or her to exercise.

Many factors exist that affect the adherence of an individual to an exercise program. Determinants of exercise adherence have been placed into the two general categories of personal and environmental factors (Weinbers & Gould, 2003). The personal factors are broken down into demographic variables, cognitive variables, and individual behaviors. The environmental factors are broken down into physical environment, characteristics of the physical activity, and social environment.

Certain types of personal factors influence exercise adherence. Demographic variables such as education, being male, and socioeconomic status are positively related to exercise behaviors (Weinbers & Gould, 2003). People with higher levels of education and higher socioeconomic status are more likely to exercise on a regular basis. Cognitive variables that have been found to have the greatest predictive ability related to physical activity are self-efficacy and self-motivation. Previous behaviors are another important personal factor. Past participation has been found to be the most reliable predictor of current participation in exercise programs (Weinbers & Gould, 2003).

Environmental factors have been found to have a significant effect on exercise behaviors (Weinbers & Gould, 2003). The physical environment, such as proximity to exercise resources and perceived lack of time, are important factors in exercise adherence. Characteristics of the specific physical activity are structural factors that have influence. Intensity and duration of the exercise, whether the exercise program involves

group or individual work-outs, and qualities of the program leader have an impact on whether or not people will tend to adhere to exercise programs. Social environment is another important factor to consider with regard to consistent participation in an exercise program. Social support from family and friends has been consistently and positively related to regular exercise behaviors (US Department of Health and Human Services, 1996).

Peer culture is a key component of social support and can have a significant influence on students' success during their formative years (Gershon, 1999). Various mentoring programs have proven successful in many different environments. Examples include the Big Brother/Big Sister organization, various mentoring programs in middle schools, high schools, and universities, mentoring programs in the business world, and the use of mentors with athletes (Gordon, 2000; Grossman & Garry, 1997; Reglin, 1997; Vidoni, Smith, Bushway & Powell, 1988; Waalkes et al., 1999; Willoughby et al., 1991).

Exercise behaviors are another area to test the effectiveness of implementing peer mentors. The project examined in this study utilized peer mentors as a key factor to assist students in completing their behavior change contracts and serve as periodic monitors to follow-up, encourage, and adapt individual change programs. The peer mentors were trained prior to the study to act as consultants, supporters, and program monitors. They were trained in the general areas of developing the helping relationship, knowledge of the program, knowledge of resources and referral procedures, and their job duties, procedures, and forms. The administration staff with expertise in each topic area provided the instruction. They were available to assist the participants in the peer-mentor treatment group throughout the project.

The participants for this study were college freshman at a Midwestern university. The participants were solicited in freshman orientation classes to take part in a state funded grant. The goal of the project was to assist students in assessment of lifestyle behaviors as they enter college through a behavioral and attitudinal change program that includes exercise, nutrition, and stress management. The focus of this specific research centered on exercise behaviors of the students. The program included a systematic process of education, consultation, implementation, and monitoring exercise and nutrition behaviors. The overall focus of the project was to provide an intervention that raises awareness of and promotes healthy, sustainable exercise and nutrition behaviors that would reduce the risk of obesity in the future of the students.

All participants completed the Health Behaviors Assessment instrument (Appendix A) online. The Health Behaviors Assessment was developed by this project's staff in collaboration with an outside staff member who provided consultation on design and evaluation aspects of the instrument. The items on physical activity included questions about the frequency during the past seven days that the participant participated in strenuous exercise, non-strenuous exercise, stretching, and strength training. Items designed to assess stage of change in exercise behavior asked about intentions to exercise, if the participant exercises on a regular basis, and if the participant has exercised on a regular basis for at least six months. The items for the Health Behaviors Assessment pertaining to exercise behaviors were based on the National College Health Risk Behavior Survey (NCHRBS) sponsored by the Centers for Disease Control and Prevention (CDC).

Participants in the mentor and no mentor groups then completed an eight week program targeting exercise, nutrition, and stress management behaviors. The mentor group participants were assigned to a peer mentor that had been trained in giving feedback to facilitate desired behavior change. They also had access to a website that included an introduction to the program, described the steps to the program, and provided various information to assist students in producing the desired behaviors. The information provided on the website includes a healthy behaviors worksheet, physical activity resources, nutrition resources, and information on stress management skills. The no mentor group did not have the aid of the peer mentors, but did have access to the website to use as they wished. At the conclusion all participants completed the Health Behaviors Assessment (Appendix A) and were given the opportunity to provide any feedback on the program.

Definition of Terms

Regular exercise is defined as a minimum of three times per week for a minimum of 20 minutes per workout. “Exercise includes activities such as power walking, jogging, swimming, aerobic dancing, biking, rowing, weight lifting, volleyball, basketball, tennis, etc. Activities that are primarily sedentary, such as bowling or playing golf with a golf cart, would not be considered exercise.” This definition was taken from the Health Behaviors Assessment (Newton, Kim, & Newton, 2006).

Peer mentor refers to a trained student that provided facilitation, support, and monitoring for the program to participants in that particular treatment group. The peer mentors met with participants in this treatment group a minimum of four occasions during the course of this program.

Frequency of exercise behaviors are assessed by utilizing the self-reported answers to questions 26 through 31 on the Health Behaviors Assessment. The questions include: 26) On how many of the past seven days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities? 27) On how many of the past seven days did you do stretching exercises, such as toe touching, knee bending, or leg stretching? 28) On how many of the past seven days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting? 29) On how many of the past seven days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work.) 30) On how many of the past seven days did you participate in physical activity for at least 30 minutes that did NOT make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors? 31) During the past seven days, on how many days were you physically active for a total of at least 30 minutes per day? (Add up all the times you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.)

Stages of change are based on the transtheoretical model developed by Prochaska, DiClemente, and Norcross (1992). The stage of change for exercise behaviors is measured by utilizing items 32-35 on the Health Behaviors Assessment. The items include the following statements: 32) I currently exercise, 33) I intend to exercise in the next six months, 34) I currently exercise regularly, 35) I have exercised regularly for the past six months. Participants answer yes or no to these four items. Participants are determined to be in the precontemplation state if they answer no to all four items.

Participants answering yes to item 33 and no to the other three items are assessed to be in the contemplation stage. Participants answering yes to items 32 and 33 are defined as being in the preparation stage. Participants answering yes to items 32, 33, and 34 are determined to be in the action stage. Participants answering yes to all four items are assessed as being in the maintenance stage.

Research Questions and Hypotheses

1) Do participants in this program increase their frequency of exercise behaviors?

It is hypothesized that both groups of participants will increase in their frequency of exercise behaviors as the program is focused on providing interventions to both the mentor and no mentor groups with this goal in mind.

2) Do differences exist in the frequency of exercise behaviors between the mentor and no mentor groups?

It is hypothesized that participants in the mentor group will exhibit significantly greater change in frequency of exercise behaviors than the no mentor group. The reasoning is the utilization of the peer mentor as an agent in implementing the exercise goals of the individual participants. This type of intervention assists in meeting the various needs of the participants as they proceed through the program, whereas the educational material provided to the no mentor group is not able to adapt to changing needs of a participant.

3) Do participants in this program progress across the transtheoretical model's stages of change?

It is hypothesized that both groups of participants will progress across the transtheoretical model's stages of change as there are interventions that can be found useful for both the mentor and no mentor groups.

4) Do differences exist in the progress through stages of change between the mentor and no mentor groups?

It is hypothesized that participants in the mentor group will exhibit greater progress across the stages of change. The reasoning is the utilization of the peer mentor in providing individualized attention and social support during the duration of the program. This type of intervention can adjust to the needs of the participant, whereas the educational material provided to the no mentor group is static and does not adapt to changing needs of a participant.

Significance of the Study

It is apparent that a variety of factors are related to exercise behaviors and that exercise increases one's emotional, psychological and physical well-being. Despite this evidence, it is well documented that younger people have become increasingly inactive in recent years (US Department of Health and Human Services, 1996). People in the maintenance phase of exercise appear to enjoy the greatest number of benefits and are significantly more likely to continue utilizing exercise behaviors throughout their life span (Prochaska et al., 1992).

This information could be of considerable importance to psychologists and other mental health professionals. What is clear is that sociocultural, personal, and environmental factors do play an important role in one's decision to engage in exercise behaviors. It is important for researchers and mental health professionals to consider

these factors when conducting research and developing interventions to address the problems associated with exercise inactivity. Social support has been shown to be an important factor helping people to exercise on a regular basis. The current research will focus on the influence of peer mentors on progression through the stages of the transtheoretical model. By discovering specific interventions that can be utilized to increase exercise behavior, psychologists and other mental health professionals may become more likely to assist people in getting to the maintenance phase and enjoying the benefits that accompany this accomplishment.

Limitations

Limitations are present in this study. The first is the use of self-report questionnaires in the study. When dealing with self-report questionnaires, researchers have to rely on accurate assessment from the participants. It is possible participants could misrepresent the frequency of their participation in exercise behaviors for various reasons. The group with peer mentors plausibly could be more prone to this happening in hopes of making a favorable impression on their mentor.

The lack of a control group is also a limitation to this study. This study does allow for comparison between two experimental groups, but does not have a control group to compare with participants that had no type of treatment.

The length of the study is another limitation. The time limitations did not allow a participant to progress into the maintenance stage unless that individual had been in the action stage for four months before the program began. This poses problems when studying the progression through the transtheoretical model's stages of change.

CHAPTER II

REVIEW OF LITERATURE

This chapter will review various aspects of exercise behavior, including the benefits of habitual exercise and problems associated with lack of exercise. The role of cultural, personal, social and psychological factors that influence exercise behavior will also be discussed. The relationship between exercise behavior and mood alteration is reviewed to illustrate what levels of exercise behavior have been found to provide the optimal results. Literature on the adoption and adherence of exercise behaviors is reviewed. This chapter will conclude with the application of the transtheoretical model to exercise behaviors in the college student population and a review on the utilization of mentors in various environments.

Effects of Exercise

It is well documented that younger people have become increasingly inactive in recent years (US Department of Health and Human Services, 1996). A variety of concerns accompany the prevalence of inactivity in today's population. These concerns include cardiovascular disease, colon cancer, osteoarthritis, increased rates of depression and decreased rates of self-esteem and self-efficacy (US Department of Health and Human Services, 1996). It is clear that lack of physical activity yields many negative consequences to our emotional, psychological, and physical well-being. Conversely, the positive effects of habitual exercise have been well documented in the literature.

Exercise has been shown to positively affect physical and psychological well-being. US Surgeon General reports have emphasized moderate, regular physical activity for both adults and children in the maintenance of health status and high quality of life (US Department of Health and Human Services, 1996). The benefits of exercise to health and well-being have been promoted by the United States government policies, the workplace, community centers, schools, universities, and a variety of other environments. Given the importance of exercise behavior to our physical and psychological health, researchers have investigated the psychological and physiological benefits of physical exercise (Asci, 2002; Field, Diego, & Sanders 2001a&b).

The US Surgeon General reported the physiological benefits of exercise include decreased risk for cardiovascular disease, colon cancer, osteoarthritis and osteoporosis (US Department of Health and Human Services, 1996). Another important area of research includes the effects of exercise on psychological and emotional variables such as anxiety, depression, suicidal thoughts, drug use, relationships with parents and peers, self-esteem, self-concept, and academic performance (Asci, 2002; Field, Diego, & Sanders 2001 a & b).

Researchers have shown a significant relationship between our psychological health and our physical health (Asci, 2002; Field, Diego, & Sanders 2001 a & b). In other words, the effects of exercise and psychological well-being are well-documented and it is clear that psychological health and physical health are interrelated. Therefore, researchers have recently given more focus to this area of investigation. Field, Diego, and Sanders (2001b) examined risk factors associated with adolescent depression. They administered a Likert-type questionnaire to 79 high school seniors from a suburban

Florida high school. The results of this study indicated that high school seniors who scored above the clinical cutoff for depression on the Center for Epidemiological Studies Depression Scale were found to spend less time exercising. The researchers suggested providing these students with more opportunities for exercise could be one of the steps to address adolescent depression. In line with this study, researchers investigated how exercise works in the process of mood modification and well-being.

Kerr and Kuk (2001) researched the effect of intensity, duration, and speed of running on the assessment of stress and reporting of pleasant and unpleasant somatic and transactional emotions. The researchers used 74 male undergraduate Dutch university students as participants. Participants were divided into fast and slow groups based on their times during the high intensity runs. The results indicated that running at 5.0 km at either high or low intensity produced improvements in positive affect, pleasant emotions increased, and unpleasant emotions decreased significantly pre- to post-exercise.

Exercisers that ran 1.7 km also experienced a significant decrease in overall unpleasant somatic emotions pre- to post-running. They did not, however, experience an accompanying significant increase in pleasant emotions. The intensity and speed of running produced less of an effect than expected. Fast runners at the 5.0 km distance experienced significantly higher levels of pleasant emotions than slow runners.

This supported the idea that fast runners were more successful at pursuing and completing their running goals than slow runners. The fast runners tended to be more regular runners. It was hypothesized that these runners were possibly more adept at setting and achieving their running goals. The processes involved in goal achievement or failure allow modulation of thoughts, affect, behavior and attention (Karoly, 1993). The

overall results of this study provided evidence of the relationship between exercise and mood alteration. Specifically, the results of this study showed a significant positive correlation between regular exercise and improved positive affect. Maximizing the psychological benefits of exercise could be achieved by allowing individual exercisers to set and achieve their own exercise goals, plans, and strategies and to self-regulate their own exercise intensity during specific exercise sessions (Kerr & Kuk, 2001).

Researchers have also investigated the effects of exercise behaviors in the reduction of symptoms of anxiety (Asci, 2002). Asci (2002) looked at the effects of participation in a physical fitness program on anxiety and physical self-concept of female university students. The exercise program involved participation in one aerobic and two step dance sessions per week for ten weeks. Results indicated participants in the fitness program (e.g., experimental group) reported a significant reduction in trait anxiety scores in comparison with a control group that was taught about psychological benefits of exercise throughout a ten-week lecture course, but was told not to participate in any organized or structured exercise. Asci's study provided evidence of the psychological benefits of exercise behaviors. The researcher also concluded that a relationship exists between physical activity and body image perceptions, suggesting that body image is another important area of investigation.

High body image dissatisfaction and low self-esteem have been related to social physique anxiety, selective presentation anxiety and omission of aspects of oneself to create desired impression, with self-esteem as a significant predictive factor in females' body image perceptions (Russell, 2002). In fact, body image dissatisfaction is so common among women, researchers coined the term *normative discontent* (Rodin, Silberstein, &

Striegel-Moore, 1984). Although body image research overwhelmingly supports that females report higher levels of body image dissatisfaction when compared to males, Pope, Katz, and Hudson (1993) found that males are increasingly reporting body image dissatisfaction. This is often associated with being underweight rather than overweight and may result in low self-esteem, depression, body dissatisfaction, and greater social adjustment problems for males (Pope, Katz, & Hudson, 1993). Individuals who report lower levels of social physique anxiety typically view their bodies favorably (Pope, Katz, & Hudson, 1993), report higher levels of self-esteem (Harter, 1999), or are disinterested in other's reactions to their body.

The scholastic arena is another factor to consider in relation to exercise behavior and motivation. Crist (1995) examined the effects that aerobic exercise had on the self-concept, classroom conduct, and academic grade average of 229 male and female sixth-grade students. Participants received structured instructions for 30 minutes, four days a week for 12 weeks. The participant's 5th grade teacher rated them academically as either "high-level" or "low-level" based on their previous classroom performance.

Approximately half of each group received vigorous aerobic exercise during treatments (e.g., experimental group), while the other participants were allowed free play-time (e.g., control group).

Significant differences were found between groups for their change in total self-concept. Experimental group participants improved 2.5% and controls fell 3.1%. The greatest changes were in the scores of the high-level students. The same pattern was found in the measurement of body-esteem. Significant correlations were found between self-concept and body-esteem. In the areas of academic performance and conduct there

were significant differences in how the groups changed. Experimental group participants improved 1.2% in academic grades, while controls decreased by 0.2%. Both groups received lower conduct scores, but the control subjects fell by a greater margin than the test subjects.

In a similar vein, Pate, Health, Dowda, and Trost (1996) determined that low physical activity was associated with low perception of academic performance in 12 to 18 year old high school students. Research indicates similar results in the college student population. Specifically, strength training has been associated with higher grade point averages with first-year college students (Troemel, Barnes, & Egget, 2000). This study provides evidence that academic factors may have a strong influence on the exercise behaviors of adults as well as children and adolescents.

Field, Diego, and Sanders (2001a) concluded that high school seniors who reported high level of exercise behaviors also had higher grade point averages. In addition, these participants reported they had better relationships with their parents (including greater intimacy and more frequent touching), were less depressed, and used drugs less than those students with a low level of exercise. It is clear that the positive benefits of regular exercise are many and varied. Subsequently, the social and cultural efforts of parents, teachers, universities, the workplace, etc., to reinforce exercise habits in children, adolescents and adults should not be underestimated.

Exercise and Culture

Russell (2002) investigated the relationship between exercise behaviors, self-esteem, body satisfaction, and social physique anxiety with African-American and Caucasian males. African-American males reported lower body dissatisfaction than did

Caucasian males in this study. The results of this study suggest that racial background is a significant cultural variable capable of influencing social physique anxiety, but not global self-esteem or body dissatisfaction. Overall, this study indicates that social physique anxiety is related to body dissatisfaction and self-esteem in males.

Guinn, Vincent, Semper, and Jorgensen (2000) also explored cultural variables in relation to exercise and self-esteem. Two hundred thirty-four Mexican American participants, ranging in age from 12 to 16, completed self-report questionnaires on goal perspectives and self-esteem. The questionnaire also included an activity involvement index. The results indicated that the Mexican American adolescent participants tended to hold a task goal perspective, similar to the tendencies of female adolescents. The task goal perspective implies learning experience, task mastery, and personal improvement as reflecting high competence and subjective success. The perception of ability for task-oriented individuals tends to be self-referenced. The researchers suggested in order to enhance the Mexican American adolescents' self-esteem in exercise settings, environments must be created that promote a task goal perspective. The researchers believed the positive perception derived by Mexican American adolescents in these environments may then positively influence their self-esteem and exercise behaviors.

Exercise and Mood Alteration

Exercise is found to increase levels of serotonin, the body's naturally produced antidepressant (Nash, 1996). By improving physical activity programs, schools can combat the problem of depression.

One area of investigation particularly important to psychologists and other mental health professionals are mood disorders. For instance, depression and anxiety are some of

the most commonly reported mood disorders. In fact, depression is so widespread, it has been referred to as *common cold* of mental health. It is estimated at any one given time, 5-9% of adult women and 2-3% of adult males have major depression, with the prevalence of anxiety disorders being very similar. The lifetime prevalence is 10-25% in females and 5-12% in males (Pennington, 2002).

Depression and anxiety appear more common in younger than older adults, with rates being the highest for individuals from 25 to 45 years old (Ingram, Scott, & Siegle, 1999). Depression and anxiety is generally recurrent and can be long-lasting. It is estimated that the average person will experience a mean of 5-6 episodes of major depression throughout their lifetime. As is typical of most behavior, previous depressive episodes are the best predictor of future depressive episodes. Therefore, it is especially important for mental health professionals to be aware of risk factors and interventions to address these problems.

Recently, psychologists and researchers have focused on the mind-body connection in relation to mental health concerns. Specifically, researchers have examined various aspects of the relationship between exercise behaviors and mood alteration. They have consistently found that desirable changes in mood do occur after being physically active (Gauvin, Fejeski, & Reboussin, 2000; Long & van Stavel, 1995). This is of considerable importance to mental health professionals working with clients who report mood disorders and other mental health concerns. Researchers have also shown some types of exercise, training parameters, and environmental conditions are more beneficial in mood enhancement than others (Berger, Pargman, & Weinberg, 2002). Berger et al.,

(2002) proposed four basic guidelines for exercise that is most likely to provide positive mood change.

The first characteristic, abdominal rhythmic breathing, is an important component of exercise and is a common technique for many stress management interventions. This type of breathing is often a result of aerobic exercise and often associated with desirable mood changes. The absence of interpersonal competition is the second exercise characteristic of positive mood change. This allows the person to avoid comparisons with others, the stress of competition, and the unfavorable mood changes that are often coupled with losing or overtraining. The third guideline includes a closed and predictable environment for beneficial mood alteration. With this type of environmental characteristic, the person does not have to attend closely to the exercise environment, so they may use the time of solitude for self-reflection. The final exercise guideline is repetitive and rhythmical movement. This is closely associated with a predictable environment and often occurs with activities such as jogging, swimming, or aerobic dance. The repetitive movements appear to allow for self-reflection or even absence of thought.

In line with these guidelines, specific training factors can influence positive mood alterations in the realm of physical activity. For instance, mood alterations may be related to the training guidelines of frequency, intensity, and time (FIT) (Berger & Motl, 2000). The minimal exercise frequency recommended is two to three times a week in order to establish a basic level of fitness. The level of fitness appears to be vital in order for one to enjoy the activity. Exercise intensity is generally indicated by the person's heart rate. High-intensity activities have been associated with undesirable mood changes,

so the recommendation is for moderate-intensity exercise to decrease possible physical discomfort or pain. The time component is also referred to as duration. Berger's (1996) results indicated positive mood alteration to be optimal from approximately 20 to 30 minutes. While these parameters are conducive to desirable mood alterations, negative mood alterations can occur in the absence of these guidelines and factors.

Without the basic guidelines and training factors that have been presented, the negative influences of exercise are many and varied. In many cases, extreme competitiveness, exercise addiction, eating disorders, and injuries tend to have damaging effects on one's psychological well-being (Berger, 1996). Negative mood alterations that take place due to these unhealthy characteristics can lead to increased tension, anxiety, disappointment, depression, anger, fatigue, and decreased motivation.

Exercise and mood alteration has been examined in both non-clinical and clinical populations. Non-clinical individuals are defined as individuals with no major psychological problems. Non-clinical individuals have shown different mood benefits with exercise when compared to the clinical population. For instance, positive mood changes in non-clinical individuals tend to be more short term when compared to the clinical population (North, McCullagh, & Tran, 1990).

Mood changes that accompany exercise in non-clinical individuals tend to last two to four hours (Raglin & Morgan, 1987; Thayer, 1996). The non-clinical population tends to experience more desirable mood states after exercising. In other words, participants who reported more negative mood states before they exercised tended to report increased levels of positive mood states after exercise. Additionally, results suggested that people who reported positive mood states prior to exercise tended to report

feeling even better after they exercised. Overall, results revealed that regardless of participant's positive or negative mood state prior to exercise, both non-clinical groups (e.g., positive mood group and negative mood group) indicated experiencing a positive change in mood after exercise, even if it was for a short period of time. This research is of considerable importance because it highlights the fact that exercise behavior is an influential factor in positive mood alteration.

The clinical population is defined as individuals with major psychological and emotional problems. In comparison to the non-clinical population, the clinical population reported positive and more long-lasting changes in their mood after exercise (Martinsen, 1993; Martinsen & Morgan, 1997). This research provides evidence for the view that exercise can benefit people diagnosed with minor and major depression in a therapeutic manner, with larger benefits coming to those with more severe depression (Craft & Landers, 1998).

In another study, running therapy was compared with two types of individual therapy for treatment of individuals with minor depression. The results indicated all three groups reported a reduction in symptoms of depression after 12 weeks, and no significant difference between groups existed (Griest, Klein, Eischens, Faris, Gurman, & Morgan, 1979). In addition to depression, anxiety disorders are another major problem in the clinical population. Raglin (1997) investigated the relationship between exercise and symptoms of anxiety. Similar to previous research findings in this area, results indicated participants who engaged in exercise behaviors also reported a significant reduction in symptoms of state anxiety (a mood state) and trait anxiety (a relatively permanent personality characteristic).

Researchers have established compelling evidence of the significant relationship between exercise and mood alteration. The current topic of interest among researchers involves the mechanisms at work in this relationship. Specifically, what mechanisms explain the relationship between exercise and mood alteration? In this new area of investigation, researchers proposed four categories: 1) psychological, 2) social, 3) physiological/ biological, and 4) a combination of psychological, social, and physical mechanisms that play an important role in the relationship between exercise and mood alteration (Berger et al., 2002). Although this area of research is in its infancy, an overview of the four categories of mechanisms will be presented next.

Proposed psychological mechanisms can include factors such as time-out from one's daily responsibilities, feelings of competency, opportunity for self-talk, expectancy of benefits or a placebo effect, improved self-concept, increased psychological energy, and opportunities for fun and enjoyment (Berger, 1996; North et al, 1990; Thayer, 1996). No single psychological variable or group of variables has been identified to consistently intervene in the exercise and mood enhancement relationship.

The enjoyment gained from being involved in exercise may produce psychological benefits that counterbalance psychological stress from everyday life (Berger & Motl, 2001; Berger & Owen, 1988). For instance, researchers revealed that rock climbers who reported high levels of psychological enjoyment in exercise also reported greater positive alterations in their mood when they engaged in these exercise behaviors (Motl, Berger, & Leuschen, 2000). This study provides evidence that positive psychological thoughts about exercise influence the enjoyment gained (e.g., positive mood alterations) when one engages in the actual physical behaviors.

In line with the psychological mechanism hypothesis, a cognitive-behavioral hypothesis was proposed to explain the link between exercise and decreases in depression (North et al., 1990). North and colleagues (1990) proposed that exercise may change the presence of negative self-talk, maladaptive automatic thoughts, the presence of systematic errors in logic, and the presence of depressive/anxious/stressed schemata that underlie depression and other undesirable psychological states. The end result of physical activity is the exerciser “feels better”.

Social mechanisms are the next hypotheses to be explored. Many people report social interaction and friendships as reasons for participation in exercise. It can be an opportunity to connect with others and discuss ideas, problems, and life events. Exercising with others can serve the need for companionship and provide an avenue of fun and stress-relief. Social support has been consistently associated to a positive interaction with adults’ physical activity and adherence to exercise programs (Sallis & Owen, 1999; US Department of Health and Human Services, 1996). However, support for social interaction in a meta-analysis of the exercise-depression relationship was not found (North et al., 1990). They proposed a possible explanation for this lack of findings. They believe that social interaction may play a more important role in beginning-level exercisers because more advanced exercisers may have already found inherent rewards to being physically active.

Physiological mechanisms can also be used to explain the exercise-mood alteration relationship. Specific physiological mechanisms include using endorphins, cortisol, monoamines, and thermogenics to describe the relationship between exercise and mood alteration. Researchers have also examined brain-derived neurotrophic factor

(BDNF) levels to view the relationship between exercise and mood alteration (North et al., 1990)

The endorphin hypothesis maintains that elevations in beta-endorphins, which occur during exercise, produce improvement in mood states. The endorphins have the effects of pain reduction and produce a euphoric state, which is similar to runner's high. Research on this hypothesis produced conflicting evidence. Naltrexone was administered to individuals prior to exercising to block endorphin production in the participants. Results of this study indicated the exercisers did not evidence an increase in endorphins or mood enhancement, thus providing support for the endorphin hypothesis (Daniel, Martin, & Carter, 1992).

However, the endorphin hypothesis has not been supported in other research. Beta-endorphin levels in the bloodstream were not found to be related to mood changes as measured by the Profile of Mood States (Farrell, Gustafson, Morgan, & Pert, 1987). This research also suggested that peripheral levels of corticotrophin, dopamine, epinephrine, norepinephrine, and growth hormone were unrelated to mood changes. The researchers hypothesized the blood-brain barrier could be related to these findings. Changes in peripheral levels of endorphins in the bloodstream would not be expected to modify the central nervous system opioid activity, so it would not affect mood states.

The monoamine hypothesis is another possible physiological mechanism that may affect the relationship between exercise and mood alteration, especially depression (O'Connor, Raglin, & Martinsen, 2000). Neurotransmitter systems form the underlying basis for much of the drug treatment of depression and anxiety. The monoamine hypothesis postulates that if exercise produces chemical changes similar to those of

pharmacological therapy, then it would explain the exercise-mood alteration relationship. However, the measurement of these physiological changes in human brains is nearly impossible because of invasive testing procedures. Thus, research in this area has been conducted primarily with rodents.

Cardiorespiratory fitness is another physiological mechanism that may contribute to the relationship between exercise and mood enhancement. The idea is that exercise programs that focus on respiratory fitness should also produce greater psychological benefits. However, North and colleagues (1990) found evidence that discounted this idea because decreases in depression were also found in nonaerobic activities, such as weightlifting.

Research has also provided evidence for the role of BDNF in pathophysiology of depression and its treatment. BDNF is the most abundant neurotrophin in the brain, and it enhances the growth and maintenance of several neuronal systems. BDNF also serves as a neurotransmitter modulator and participates in long-term potentiation and learning (Russo-Neustadt, Ha, Ramirez, & Kesslak, 2001). The up-regulation of BDNF has been shown to occur when chronic treatment with antidepressant medications has been utilized and the infusion of the neurotrophins led to the recovery of behavioral deficits in depression-model animals (Russo-Neustadt, Beard, Huang, & Cotman, 2000).

Additionally, physical exercise rapidly up-regulates levels of BDNF and has been shown to decrease depression and anxiety. Researchers investigated the convergent manner in which physical exercise and antidepressant treatment work to affect levels of BDNF (Russo-Neustadt, et al., 2000). Results indicated that these two variables, when applied together, potentiate the full level of BDNF messenger RNA achieved and

accelerate the response. In other words, the results show these two interventions may act through convergent molecular mechanisms. Chronic antidepressant treatment leads to an up-regulation of BDNF levels in the hippocampus and exercise enhances that effect (Russo-Neustadt, et al., 2001).

Another hypothesis for the exercise mood enhancement relationship involves a possible combination of mechanisms and the alteration of these mechanisms in different activities. In other words, specific mechanisms, or combinations, may occur readily in some types of exercise and in specific settings (Berger et al, 2002). For example, a curvilinear relationship may exist in which a range of specific exercise intensities and durations may be necessary to elevate endorphin levels to a point where mood alteration occurs and after that point endorphin levels decrease. Other physiological, psychological, or social mechanisms could be investigated in this manner.

Personal differences may also influence individuals to react differently to physiological stimuli. For instance, Guinn et al., (2000) considered cultural variables in relation to exercise behaviors in Mexican American adolescents and found these participants preferred an environment that promoted a task goal perspective. In this case the individual's psychological and physiological mechanisms would interact which may significantly influence the individual's mood. What is apparent is the relationship between these variables is so complex that much more research is needed to provide a more clear understanding of the relationship between exercise behaviors and mood alteration.

Exercise Adoption and Adherence

The benefits of exercise behaviors have been illustrated thus far. However, research has also shown an increasing level of inactivity throughout the population in recent years (US Department of Health and Human Services, 1996). In fact, the US Department of Health and Human Services (1996) reported over 50% of adults are completely sedentary. Considering the current obesity epidemic of the American culture and the co-occurring physical and mental health problems that are highly related, it is critical to gain a better understanding of factors that deter individuals from exercising on a regular basis. Berger, Pargman, and Weinberg (2002) addressed this topic in three categories: sociocultural, personal, and environmental factors.

During childhood and adolescent development, friends play an enormous role in an individual's choice of activities. This is one of the many sociocultural influences that affect a youth's decision to participate in exercise, sport, or play. Family also has a large influence on a child or adolescent's decision to exercise. The parent(s) preferences for activities and the family's financial means to support these activities can influence whether or not youth have an opportunity to engage in exercise, sport or play. For instance, children of low socio-economic status are often not afforded the same opportunities of playing golf when compared to higher socio-economic status children. Ethnicity is another sociocultural factor that influences the activity level of the youth population (Berger, Pargman, & Weinberg, 2002).

Berger et al., (2002) emphasize personal factors as the second category that influences exercise behaviors. For instance, the physical self is often a large component of a person's self-perception and their ability to participate in certain activities (i.e.,

basketball players are usually tall, football players are usually males). Furthermore, personality type tends to affect one's motivation to become involved in certain activities. If personality does not match up well with characteristics of an exercise activity, then the tendency for that person is to quit the activity. When one does not perceive him or herself as competent to perform an activity then he or she will often be unsuccessful. Lack of success experienced by the individual may also lead to increased dropout rates. There is an inverse relationship between self-worth and dropout rates: when self-worth decreases, dropout rates increase. Conversely, positive self-worth is vital to participation and adherence to an exercise program (Berger, Pargman, & Weinberg, 2002).

Berger et al's., (2002) final category of influence for motivation to participate in exercise is environmental factors. Support from friends and family is the major component of this category. As children develop into adolescents, friends become more and more influential in choices about participation in exercise and sport. It is important to feel supported by family, but the authors emphasized youth often decide whether or not to participate in exercise activities based on the decisions of friends. What is clear is that sociocultural, personal, and environmental factors do play an important role in one's decision to engage in exercise behaviors. It is important for researchers and mental health professionals to consider these factors when conducting research and developing interventions to address the problems associated with exercise inactivity.

In line with this idea, Sullum and Clark (2000) looked for predictors of exercise relapse in the college population. They studied 52 college undergraduate students for an eight-week period. All participants exercised on a regular basis at the beginning of the study. The researchers were interested in the processes of change to determine which

process individuals would use to change their exercise behaviors. The processes of change are aspects of the transtheoretical model defined as strategies and techniques utilized to change behavior (Prochaska, DiClemente, & Norcross, 1992). A decisional balance measure was utilized to analyze the pros and cons associated with exercise. Self-efficacy was measured to determine each participant's confidence when exercising in various situations. At the conclusion of the study, seven (13%) participants were classified as exercise relapsers and 45 (87%) of the participants were classified as exercise maintainers. The researchers found no difference in the processes of change between the exercise relapsers and maintainers. However, it was reported that exercise relapsers had higher levels of negative attitudes toward exercise at the baseline of the study, and their ratings of positive attitudes toward exercise decreased over time.

The pros for exercise made no significant change with the maintainers. The exercise relapsers also scored lower on self-efficacy at baseline than maintainers. The findings support the application of the transtheoretical model to the university population and the utilization of self-efficacy as a predictive factor in exercise relapse (Sullum & Clark, 2000). However due to the limited number of participants in this study, more research is needed to better understand the transtheoretical model in relation to exercise behavior change and adherence.

Transtheoretical Model

The transtheoretical model has been applied to many areas related to human behavior change, such as smoking cessation, substance abuse, diet modification, and exercise (Prochaska, DiClemente, & Norcross, 1992). Prochaska et al., (1992) argued that individuals progress through stages of change and that movement across these stages

is cyclic rather than linear. The transtheoretical model implies that different interventions and information need to be tailored to match the particular stage an individual is in at the time. The five stages of this model include: 1) Precontemplation, 2) Contemplation, 3) Preparation, 4) Action, and 5) Maintenance stages.

During the precontemplation stage individuals do not intend to start exercising in the next six months. People in the first stage may be demoralized about their ability to change, may be defensive due to social pressures, or may be uninformed about the long-term consequences of their behavior.

The contemplation stage includes people that seriously intend to exercise within the next six months. Research has shown that individuals tend to remain in this stage for approximately two years (Prochaska et al., 1992). However in this stage, people may have thoughts about starting to exercise, but they are unlikely to act on these thoughts and engage in actual behavior change.

The preparation stage includes people that are exercising, but not on a regular basis. The activity in this stage is not enough to produce major benefits. In the preparation stage, individuals typically have a plan of action and take action to make behavioral changes, but long term behavior change is still limited.

The action stage involves regular exercise (three or more times a week for 20 minutes or longer) for fewer than six months. This tends to be the least stable stage and corresponds with the highest risk for relapse. It is also the busiest stage, in which the most processes for change are being used.

The maintenance stage includes individuals that exercise on a regular basis for more than six months. Once they have stayed in this stage for five years, they are likely

to maintain regular exercise throughout their life span with the exception of time-outs due to injury or other health-related problems.

Researchers have found support in matching intervention strategies to the stage of change (Marcus, Banspach, Lefebvre, Rossi, Carlton, & Abrams, 1992). Conversely, the attrition rate is high when there is a mismatch between the intervention and stage. An example of this type of mismatch would be focusing on maintenance strategies for an individual in the contemplation stage. Instead, motivational strategies would be a more appropriate intervention for people in the contemplation stage. Thus, adherence is improved by matching treatment strategies to an individual's stage of change.

Marcum and colleagues (1992) studied 610 adult participants in a six-week program designed to increase physical activity. The intervention consisted of stage-matched self-help materials. At the conclusion of the intervention, 30% of participants in the contemplation stage at the baseline and 61% of those in the preparation stage progressed into the action stage. Additionally, 31% of the participants in the contemplation stage progressed into the preparation stage. Four percent of those in preparation and 9% of those in action regressed. This study supports the transtheoretical model in that matching intervention strategies to an individual's stage of change influences their progression through these stages to produce positive long-term behavior modification.

The transtheoretical model identifies 'when' people change, but it is also necessary to consider 'how' people change. The strategies and techniques people use to change their behaviors are part of this process. Cognitive and behavioral strategies are two categories to consider in how people change. Rosen (2000) indicated that processes

of change used by individuals in relation to exercise differ from those employed in programs involving smoking cessation, substance abuse, and diet change. People who exercise in the action and maintenance stage use cognitive processes more frequently than people who exercise in the other stages of change. Rosen (2000) hypothesized that exercise is a positive behavior that might be increased if people continually think about it. Examples of cognitive processes include: consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, and social liberation. Behavioral processes include counterconditioning, helping relationships, reinforcement management, self-liberation, and stimulus control.

Prochaska and colleagues (1992) proposed that people go through a kind of cost-benefit analysis identified as decisional balance in making decisions about exercise. In other words, when people consider a change in lifestyle they weigh the pros and cons of a given behavior. These researchers found that the cons tend to be greater than the pros during the precontemplation and contemplation stages. It crosses over to a balance during the preparation stage and the pros of exercise are greater during the action and maintenance stages (Prochaska et al., 1992). This information suggests that it is important for exercise specialists to help individuals who are contemplating exercise realize all of the benefits of exercise to help them move from contemplation to preparation.

Transtheoretical Model, Exercise Behaviors, and College Students

Rodgers, Courneya, and Bayduza, (2001) examined the effectiveness of utilizing the transtheoretical model in three populations. They looked at it with high school students, university students, and employed adults through the use of self-report

questionnaires. The high school students were recruited from local high schools and had parental consent. They were allotted time in class by teachers in health and physical education classes to participate in this study. Questionnaires were filled out by the students after given the instructions not to talk or look at other students' responses. There were 168 usable questionnaires returned. The university student sample was part of a required first-year undergraduate course. They were given the questionnaires to complete during class time. There were 215 usable questionnaires completed by university students. The employed adults consisted of a convenience sample recruited from a local government office and a telecommunications firm. Managers of these businesses were contacted and those that agreed then distributed questionnaires to their employees. The participants that were interested completed the questionnaires at their place of business, sealed them in an envelope, and placed them in a box provided to gather the responses. There were 63 completed questionnaires that were usable.

An algorithm that provided definitions for vigorous physical activity and what is required for regular vigorous activity was used to assess the stage of change for the participants. The definition was "Vigorous physical activity or exercise includes hard activities such as jogging, aerobics, swimming, and biking. For vigorous activity to be regular, it must be at least 20 minutes each time, and be done at least 3 days per week" (Rodgers, Courneya, & Bayduza, 2001). The Processes of Change Questionnaire (Marcus, Rossi, Selby, Niaura, & Abrams, 1992) was used to assess processes of change endorsed by the participants. Rodgers, Courneya, and Bayduza, (2001) used five items related to exercise behaviors on five-point rating scales to assess self-efficacy. The scales ranged from one (equals not at all confident) to five (equals extremely confident). Their

study found significant differences in the transtheoretical model variables across the stages and among populations. This study failed to find a stage-by-population interaction and thus provided support for the use of the transtheoretical model across age groups. With application to the current study the transtheoretical model has been found to be effectively applied to university students.

Cardinal and Kosma (2004) looked at constructs from the transtheoretical model as they applied to the study of muscular fitness promotion. Four hundred twenty-nine college students participated by completing self-report questionnaires. They were recruited through university courses over the course of one year. The students were given research credit or extra credit for their involvement in the study. They were assessed for stage of change for muscular fitness-promoting behaviors and self-efficacy. “Stage of Change for Muscular Fitness Promoting Behaviors Measure”, self-report questionnaire developed by Cardinal (1998), was used to assess the participants for their stage of change. This study utilized a modified version of the Process of Change Questionnaire (Marcus et. al., 1992) to measure which processes were used by the participants. This study assessed self-efficacy by using a modified version of a 12-item instrument developed by Sallis, Pinski, Grossman, Patterson, and Nadar (1988). The results found behavioral and cognitive processes of change and self-efficacy to be significant contributors in the prediction of stage of change for muscular fitness-promoting behaviors.

Peer Mentors

Peer culture can have a significant influence on students’ success during these formative years and mentoring relationships are ideal for promotion of an individual’s

well-being (Gershon, 1999). Mentoring involves matching an inexperienced individual with another more experienced person who will provide sustained guidance and support in hopes of strengthening self-esteem and confidence (System, 1990). Mentoring relationships are able to facilitate learning and development and to assist individual through times of transition through the provision of encouragement and support (Merriam, 1983).

The characteristics of a mentor include being encouraging, supportive, nonjudgmental, and a confidante (Reglin, 1997; Zachary, 2000; Zey, 1984). Mentors serve as a source of support. A mentor is an individual who teaches, sponsors, and guides a protégé into new areas while acting in a supportive role and providing vision (Vidoni et al., 1988). Effective mentors have goals, commitment, realistic or high expectations, flexibility, respect for an individual's rights, firmness, supportive techniques, and good listening skills (Boyle & Boice, 1998; Wunsch, 1994). Models of mentoring programs that have proven successful can be found throughout the literature. Examples include the Big Brother/Big Sister Organization, various mentoring programs in middle schools, high schools, and universities, mentoring programs in the business world, and the use of mentors with athletes (Gordon, 2000; Grossman & Garry, 1997; Reglin, 1997; Vidoni, Smith, Bushway & Powell, 1988; Waalkes et al., 1999; Willoughby et al., 1991).

Gershon (1999) examined the perceived effectiveness of a peer-mentoring program and the peer mentors' influence on the adjustment of first-year college students. In this study, the mentors were returning students who were residents in on-campus housing. These mentors were matched with first-year students. Mentors participated in

an orientation session and structured activities were implemented to facilitate the mentor-protégé relationship. Evaluation of the program indicated that both the mentor and protégé felt that sharing common interests was an important variable and led them to spend more time together. The amount of time spent together was an important variable in the adjustment of the protégé. Protégés who met with their assigned mentors once per week or more scored significantly higher in areas of social adjustment and college attachment than did other protégés and the non-participants surveyed.

Morrissey and Helfrich (1996) examined the use and potential effectiveness of peer-mentoring programs for first-year student athletes at the University of Delaware. The Student Services for Athletes Program designed and implemented a mentoring program in 1995. Their program matched multiple small groups of first-year student athletes with three or four upper-class mentor student athletes. Mentors were selected and trained, then met with their groups after orientation and several other times throughout the year. Topics for discussions were designed to allow the junior and senior student-athlete mentors to assist the first-year student athletes with handling athletic, academic, social, and emotional transitional issues. Qualitative measures through interviews of the freshman indicated the program was useful in assisting successful transition during their first year at the university.

The recognition of specific goals and activities necessitates specific training for the process of mentoring (Wunsch, 1994). The amount of training needed varies with each mentoring program. Mentor training generally includes three objectives: to explain the goals of the mentoring program and outline the needs of the protégés; to establish mentoring ground rules and procedures; and to develop mentoring skills (Golden & Sims,

1999). The objectives of the program should be passed to the mentors through an informal and interactive training style. Providing case studies or role playing examples have proven effective means in training mentors (Miller, 2002). Part of a mentor's training should include self-assessment. The assessment should be followed by a clear explanation of the role the mentor will play. At this time the mentor is able to determine which skills could use honing in order to fulfill the demands of the mentoring relationship (Zachary, 2000). In addition to the assessment of skills and the provision of a clear role definition, a component recommended for mentor training includes codes of practice. Mentors should receive clear guidelines to acceptable behaviors when dealing with their protégés (Miller, 2002).

Conclusion

There is a great deal of research on exercise behaviors, the various benefits, and factors that influence adherence to exercise programs. What is questionable is why such a large percentage of adults remain sedentary with the knowledge of benefits that are available. The transtheoretical model provides a lens to view this concern. The purpose of this research is to examine the question of how individuals can increase exercise behaviors and get to the maintenance stage.

The transtheoretical model has been determined to be effectively implemented with the college student population. Social support is one of the important factors that influences adherence to an exercise program. Mentoring relationships can provide the valuable support that promotes the change process. Peer mentors have been shown to effectively assist college students in various areas of functioning during times of transition by facilitating learning and development. They also provide encouragement

and support to those attempting to make changes in their lives. This study looks at the relationship between exercise behaviors and the benefit of peer mentors. This research examines the question of whether or not peer mentors can be utilized effectively to assist college students with progression through the stages of change for exercise behavior.

CHAPTER III

METHODOLOGY

This chapter includes a description of the participants, procedure, and research instruments.

Participants

The participants for this study were college freshman at a Midwestern university. Participants were enrolled in freshman orientation classes and given credit towards their course for participation. Sixty-three students participated with peer mentors, while 75 students participated without the assistance of peer mentors.

Participants in the study were 95 women (68.84%) and 43 men (31.16%). Their ages ranged from 18 to 22, with the average age being 18.29, and 97.10% of participants being either 18 or 19 years old. One hundred thirty-six of the participants were full-time students, while two were not full-time students. The participants included 121 White-non Hispanic students, seven Black-non Hispanic students, three Hispanic or Latino students, one Native American student, two Multi-racial students, and four participants responded to the “Other” category. The demographics of this sample are summarized in Table 1.

Procedure

Participants were solicited in freshman orientation classes to take part in a state funded grant examining exercise behaviors. The goal of the project was to assist students in assessment of lifestyle behaviors as they enter college through a behavioral and attitudinal change program that includes exercise, nutrition, and stress management. The

Table 1

Demographics

<u>Variable</u>	<u>n</u>	<u>Percent</u>
<hr/>		
Sex		
Female	95	68.84
Male	43	31.16
<hr/>		
Race/Ethnicity		
White-non Hispanic	121	87.68
Black-non Hispanic	7	5.07
Hispanic/Latino	3	2.17
Native American	1	0.72
Multi-racial	2	1.45
Other	4	2.90
<hr/>		
Age		
18	106	76.81
19	28	20.29
20	1	0.72
21	1	0.72
22 or older	2	1.45
<hr/>		
Student Status		
Full Time	136	98.55
Part Time	2	1.45
<hr/>		

focus of this specific research centered on exercise behaviors of the students. The program included a systematic process of education, consultation, implementation, and monitoring of exercise and nutrition behaviors. The overall focus of the project was to provide an intervention that raises awareness of and promotes healthy, sustainable exercise and nutrition behaviors that would reduce the students' risk of obesity in the future.

The implementation of this project was a collaborative venture between three service offices on the university campus. The offices included Recreational Services Exercise and Wellness Program, Health Center Health Promotion/Nutrition Counseling, and Counseling Services Stress Management and Biofeedback Center. Classroom access was facilitated by the faculty coordinators of the freshman orientation classes in three colleges (Education, Arts and Sciences, and Agriculture). The initial assessment was given as an assignment or extra credit option in each of the classes.

Phase one of the project involved administering the Health Behaviors Assessment (Appendix A), a personal lifestyle assessment survey. A total of 695 freshman students completed this assessment during the first two weeks in the orientation class. Following the initial assessment classes that included 450 of those students received a 50 minute classroom presentation on the project. The presentation provided information on the healthy lifestyles, explained the program, and provided an opportunity to recruit participants into one of two groups (mentor or no mentor). Incentives were provided for participation in the program that included credit for a course activity assignment and recognition prize (t-shirt, water bottle, or sport bag). Option one (mentor group) had 85 volunteers, while option two (no mentor) had 148 volunteers after the classroom

presentations. Due to drop outs 63 participants completed option one and 75 participants completed option two.

The organization of participants into the two options was followed by small group sessions where they received data on how their personal profile compares with campus norms and an introduction to the second phase of the program. Phase one provided an outcome for the project. The outcome was a descriptive baseline of the self-reported health behaviors of a large sampling of freshman students.

The second phase introduced the treatment groups to a systematically structured process utilizing strategies of physical activity, nutrition, and stress management. The change process utilized evidenced based strategies in assessment, analysis, goal setting, and monitoring to establish an individualized plan using the healthy behaviors worksheet (Appendix B). The guidelines for developing and using the process, learned from evidenced based health intervention programs identified by the Task Force on Community Preventive Services (Briss, Brownson, Fielding, & Zaza, 2004), were used in this project. The strategies for change include proven activities outlined by professional consultants and the research literature in exercise, nutrition, and stress management. Outcome measures utilized by the peer mentors to assist participants included behavioral measurement, logged activity, goal attainment, quantitative and qualitative scaling, and survey data utilizing criterion standards.

All participants completed the initial assessment instrument online. The mentor and no mentor groups then participated in an eight week program targeting exercise, nutrition, and stress management behaviors. The mentor group participants were assigned to a peer mentor that had been trained in giving feedback to facilitate desired

behavior change. They also had access to a website that included an introduction to the program, described the steps to the program, and provided information to assist students in producing the desired behaviors. The information provided on the website included a healthy behaviors worksheet (Appendix B), physical activity resources, nutrition resources, and information on stress management skills. The no mentor group did not have the aid of the peer mentors, but did have access to the website to use as they wished. At the conclusion, all participants completed the Health Behaviors Assessment (Appendix A) and were given the opportunity to provide any feedback on the program.

The project utilized peer mentors as a key factor to assist students in completing their change contracts and serve as periodic monitors to follow-up, encourage, and adapt individual change programs. The peer mentors were trained during the summer prior to the study as consultants, supporters, and program monitors. The peer mentors were trained for this program over seven sessions for a total of 16 hours. They were trained in the general areas of developing the helping relationship, knowledge of the program, knowledge of resources and referral procedures, and their job duties, procedures, and forms. The administration staff with expertise in each topic area provided the instruction.

The first session included an overview of the program and materials. The peer mentors were introduced to the materials used in the program, the web page, and the notebook used for logging activity. They learned about the state grant and specific goals for the program. The peer mentors also participated in a team building activity.

The second session involved the peer mentors going through a simulation of the program. They each completed an assessment followed by an interpretation. They then completed the action plan and goal attainment portion of the program. This simulation

allowed the peer mentors to gain a better understanding of the Health Behaviors Assessment, Health Behaviors Assessment Profile, Establishing Healthy Behaviors Worksheet, and the Goal Attainment Scaling.

The third session focused on the helping relationship and principles of good mentoring. They reviewed standards of ethical behavior to be followed by all peer mentors. They were trained on characteristics of a helping relationship and tips for successful mentoring. The mentors learned about the importance of listening, informing, and organizing. The peer mentors also learned about tips for implementing a supportive atmosphere and conditions that promote student development.

The fourth, fifth, and sixth sessions focused on physical activity, eating behaviors, and stress management, respectively. The peer mentors were taught about physical activity, fitness, and exercise information and resources. They were also trained in referral procedures to connect the students with the appropriate resources. Information, resources, and referral procedures were also covered for eating behaviors and nutrition in the fifth session and stress management and time management during the sixth session.

The final training session involved training on job duties of the peer mentors, procedures, and forms. They were trained in how to contact students, make appointments, and arrange meeting places. The peer mentors were trained in how to keep records of their activities, their office hours, and procedures for phone and email contacts. Training also included what to cover during in person contacts and what space was available to schedule those meetings. The peer mentors were trained on how to accurately fill out student report sheets and how to administer follow-up evaluations. The peer mentors practiced simulation interviews and interactions at the conclusion of the

seventh session to implement what they had learned during the training and get feedback on their performance.

The peer mentors met face-to-face with the individual participants a minimum of four times during the eight weeks of the project. Meetings took place in designated offices at the university's recreation center. Peer mentors were also available for contacts via email or telephone for use at the participants' discretion. The peer mentors' support primarily fell into the areas of setting goals, designing action steps, and monitoring progress. Peer mentors also provided motivation for the participants throughout the program.

Peer mentors initially assisted participants in developing individualized goals utilizing the healthy behaviors worksheet (Appendix B). Utilizing the results of the pre-test on the Health Behaviors Assessment peer mentors assisted participants in determining specific aspects of exercise they wanted to address. The participants were asked to briefly describe aspects of their exercise participation they wanted to target. Then peer mentors helped participants to identify and describe a behavior they wanted to establish or enhance and their goal for that behavior.

Peer mentors were trained to utilize certain guidelines for developing realistic and appropriate goals. They encouraged the participants to focus on something that was genuinely important and that they were motivated to implement. Peer mentors helped participants to identify specific goals such as, "improve physical fitness by exercising at least three days a week for 30 minutes" rather than goals that are too general and abstract such as, "feel healthier". Peer mentors would ask the participants if they were able to influence the situation specific to their concern. For example, they were steered away

from wanting to exercise with certain friends at a certain time five days a week because the friend's schedule may not allow for this to occur. Participants were to identify goals that made them stretch beyond their present level of exercise, but not goals that were out of their reach. An example of this could be increasing one's strength on the bench press by 10% over the next 60 days, rather than the unrealistic goal of a 50% increase during the same amount of time. Participants were also asked to identify goals they could count or measure so that progress toward their goals could be gauged.

The identification of driving forces and restraining forces was an important task peer mentors helped the participants to accomplish as action steps were designed. The participants listed the driving forces that helped them to achieve their goals. They did the same with restraining forces that acted as barriers to accomplishing those same goals. Peer mentors asked participants to prioritize the most important driving and restraining forces to reaching their goals. They would help participants to brainstorm possible action steps that could be carried out in order to reduce or eliminate the effect of restraining forces. The same process was used for creating a list of actions that would act to support the most important driving forces. Participants were asked to include the most important driving and restraining forces and action steps under each on their healthy behaviors worksheet.

The next aspect of the peer mentors' responsibilities involved monitoring progress of the participants. Peer mentors educated participants on goal attainment as a means to measure their progress. Participants were encouraged to write descriptions of specific behaviors that would serve as standards for attainment at each level of their goal.

Peer mentors provided participants with access to daily or weekly tracking charts (Appendix C) to record the progress of their exercise behaviors. The participants would evaluate goal attainment at the end of each week using the scale that they devised with their peer mentor. Peer mentors encouraged participants to reward themselves appropriately for accomplishments working toward their goals. The peer mentors were available to assist participants in customizing their individual programs. The peer mentors would help participants to make appropriate adjustments in their programs, if necessary, after assessing the first one to two weeks of the program's implementation.

Instrumentation

Health Behaviors Assessment (Newton et al., 2006)

The Health Behaviors Assessment consists of fifty-one items (Appendix A). The demographic information items queried the participant's name, age, gender, student status, race/ethnicity, residence, membership in a sorority/fraternity, number of hours worked per week, height, and weight. The instrument asked the participant about the areas of weight loss practices, nutrition, physical activity, and stress management. The items on physical activity included questions about the frequency during the past seven days that the participant participated in strenuous exercise, non-strenuous exercise, stretching, and strength training. Items designed to assess stage of change in exercise behavior asked about intentions to exercise, if the participant exercises on a regular basis, and if the participant has exercised on a regular basis for at least six months.

The Health Behaviors Assessment was developed by this project's staff in collaboration with an outside staff member who provided consultation on design and

evaluation aspects of the instrument. The outside staff member was from an extension office that served as a resource to integrate research and best practice.

The items for the Health Behaviors Assessment pertaining to exercise behaviors were based on the National College Health Risk Behavior Survey (NCHRBS) sponsored by the Centers for Disease Control and Prevention (CDC). The NCHRBS was developed by the CDC in 1995 to monitor health risk behaviors in students attending colleges or universities in the United States (Douglas & Collins, 1997). The goal of the CDC was to provide the assessment of a broad range of health risk behaviors that contribute to the leading causes of mortality and morbidity for young people in one questionnaire. Reliability has shown to be good on this instrument (Brenner, Collins, Kann, Warren, & Williams, 1995) and specifically items on physical activity have demonstrated excellent test-retest reliability (Dinger, 2003).

Dinger's (2003) study examined the reliability and validity of the NCHRBS vigorous physical activity (VPA), moderate physical activity (MPA), flexibility (FLEX), and muscular strength and/or endurance (MSE) questions using 20 college students. The students completed the items, kept daily activity logs, and wore an accelerometer and a pedometer while awake. The intraclass correlation coefficients ranged from .94-.99 for the four items. The vigorous item was highly correlated with log VPA ($r = .82$) and number of days with > 20 minutes of VPA from the accelerometer ($r = .60$). The flexibility item was moderately correlated ($r = .57$) and the muscular strength and/or endurance item was highly correlated ($r = .89$) with corresponding log activities. The moderate item was highly correlated with log MPA ($r = .66$) and number of days with > 30 minutes of MPA from the accelerometer ($r = .61$). Dinger found the NCHRBS

physical activity items have excellent test-retest reliability and validity indices similar to other self-report physical activity questions.

CHAPTER IV

FINDINGS

This chapter describes the results of this study. This study evaluated the way in which being involved with a peer mentor or having no peer mentor related to the frequency of exercise behavior and progression across the transtheoretical model's stages of change.

Research question one (Do participants in this program increase their frequency of exercise behaviors?) was analyzed using a within group one-way analysis of variance. Analyses were run separately for each of the six questions (Question number's 26-31) on the Health Behaviors Assessment measuring frequency of exercise behaviors.

Research question two (Do differences exist in the frequency of exercise behaviors between the mentor and no mentor groups?) was analyzed using a two by two analysis of variance with pre and post testing on the independent variable of having a mentor or not having a mentor using frequency of exercise behaviors as the dependent variable. Analyses were run separately for each of the six questions measuring frequency of exercise behaviors.

For research question three (Do participants in this program progress across the transtheoretical model's stages of change?) participants were assigned to a stage of change based on their pretest results from the Health Behaviors Assessment and then assigned an individual change score (post-test stage of change – pretest stage of change). The change scores were grouped for each level of the independent variable by assigned

stage of change. Group means for individual change scores were then calculated for the mentor group and no mentor group at each stage of change.

Research question four (Do differences exist in the progress through stages of change between the mentor and no mentor groups?) was analyzed using independent t-tests comparing both levels of the independent variable (mentor and no mentor groups) by the dependent variable of progress score while being grouped by pretest stage of change.

Research Question 1

For research question one (Do participants in this program increase their frequency of exercise behaviors?) a within group one-way analysis of variance was completed. Analyses were run separately for each of the six questions (Question number's 26-31) on the Health Behaviors Assessment measuring frequency of exercise behaviors (Table 2). The questions were as follows: 26) On how many of the past seven days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities? 27) On how many of the past seven days did you do stretching exercises, such as toe touching, knee bending, or leg stretching? 28) On how many of the past seven days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting? 29) On how many of the past seven days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work.) 30) On how many of the past seven days did you participate in physical activity for at least 30 minutes that did NOT make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors? 31) During the past seven days, on how many days were you physically active for a total of at least 30 minutes per day? (Add up all the times you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.).

The reason behind performing a separate analysis of variance for each question was an attempt to identify any differences with the intervention utilized in this study for the various types of exercise behavior.

Results indicate a significant increase in exercise behaviors measured by three of the six questions. For question 27 (stretching) $F(1, 136) = 35.72, p = .00$. For question 28 (strengthening) $F(1, 136) = 19.26, p = .00$. For question 31 (overall physical activity) $F(1, 136) = 3.84, p = .05$.

Table 2

Overall Means and F-values for Questions 26-31 of the Health Behaviors Assessment

Variable	Pretest Mean	Posttest Mean	F	<i>p</i>
Q 26	3.56	3.85	2.55	.11
(At least 20 minutes of high intensity physical activity)				
Q 27	2.69	3.65	35.72	.00
(Stretching)				
Q 28	2.52	3.24	19.26	.00
(Strengthening exercise)				
Q 29	4.73	4.42	1.59	.21
(At least 30 minutes of walking/bicycling)				
Q 30	3.59	3.91	1.81	.18
(At least 30 minutes of low intensity physical activity)				
Q 31	4.65	4.99	3.84	.05
(At least 30 minutes of overall physical activity)				

Research Question 2

For research question two (Do differences exist in the frequency of exercise behaviors between the mentor and no mentor groups?) a two by two analysis of variance was completed with pre and post testing on the independent variable of having a mentor or not having a mentor using frequency of exercise behaviors as the dependent variable (Table 3). Analyses were run separately for each of the six questions measuring frequency of exercise behaviors.

Results indicate significant interactions between the mentor and no mentor groups and time on two questions. For question 27 (stretching) $F(1, 136) = 6.08, p = .02$. For question 31 (overall physical activity) $F(1, 136) = 5.33, p = .02$. The interaction on Question 28 (strengthening) is approaching significance with $F(1, 136) = 3.43, p = .07$.

Table 3

F-values for Interaction Effect of Mentor/No Mentor and Time on Questions 26-31 of the Health Behaviors Assessment

Variable	F	<i>p</i>
Q 26	2.13	.15
(At least 20 minutes of high intensity physical activity)		
Q 27	6.08	.02
(Stretching)		
Q 28	3.43	.07
(Strengthening exercise)		
Q 29	0.34	.56
(At least 30 minutes of walking/bicycling)		
Q 30	1.41	.24
(At least 30 minutes of low intensity physical activity)		
Q 31	5.33	.02
(At least 30 minutes of overall physical activity)		

A summary of pretest and posttest means for frequency of exercise behaviors measured by Questions 26-31 of the Health Behaviors Assessment for the mentor and no mentor groups is provided in Table 4. Pairwise comparisons were completed using the Tukey test for the three questions that had significant or approaching significance interactions between mentor/no mentor and time.

The pairwise comparisons were completed within groups to investigate change in frequency of exercise behaviors for the mentor and no mentor groups (Table 5). The mentor groups significantly increased frequency of exercise behaviors measured by Questions 27 (stretching), 28 (strengthening), and 31 (overall physical activity). The no mentor group significantly increased exercise behavior measured by Questions 27 (stretching).

The pairwise comparison between groups was used to identify any differences between the mentor and no mentor group at pre test and at post test (Table 6). The mentor and no mentor groups were not significantly different on any of the three measures at pretest. Significant difference exists between the mentor group and no mentor group at posttest on Question 27 (stretching). Significant difference exists between the two groups on Question 28 (strengthening), however, this must be interpreted with caution due to the results of the overall interaction effect for this measure $F(1, 136) = 3.43, p = .07$.

Table 4

Summary of Mentor and No Mentor Group Means at Pretest and Posttest for Questions

26-31 of the Health Behaviors Assessment

<u>Question</u>	<u>Variable</u>			
	Mentor		No Mentor	
	Pre	Post	Pre	Post
Q 26	3.56	4.16	3.55	3.58
(At least 20 minutes of high intensity physical activity)				
Q 27	2.84	4.24	2.57	3.15
(Stretching)				
Q 28	2.60	3.67	2.45	2.88
(Strengthening exercise)				
Q 29	4.83	4.67	4.65	4.22
(At least 30 minutes of walking/bicycling)				
Q 30	3.49	4.14	3.68	3.72
(At least 30 minutes of low intensity physical activity)				
Q 31	4.35	5.18	4.91	4.84
(At least 30 minutes of overall physical activity)				

Table 5

Summary of Pairwise Comparisons from Pretest to Posttest Within Groups for Questions 27, 28, and 31 of the Health Behaviors Assessment

Variable	<u>Question</u>					
	#27		#28		#31	
	Mean Difference	<i>p</i>	Mean Difference	<i>p</i>	Mean Difference	<i>p</i>
Mentor	1.40	.00	1.06	.00	0.83	.00
No Mentor	0.58	.01	0.43	.06	-0.07	.80

Table 6

Summary of Pairwise Comparisons Between Mentor and No Mentor Groups for

Questions 27, 28, and 31 of the Health Behaviors Assessment

Variable	<u>Question</u>					
	#27		#28		#31	
	Mean Difference	<i>p</i>	Mean Difference	<i>p</i>	Mean Difference	<i>p</i>
Pre Test	0.27	.42	0.16	.62	0.56	.15
Post Test	1.09	.00	0.79	.02	0.34	.37

Research Question 3

For research question three (Do participants in this program progress across the transtheoretical model's stages of change?) participants were assigned to a stage of change based on their pretest results from the Health Behaviors Assessment. The precontemplation stage did not have a representative distribution after the pretest. No participants in the mentor group were classified in the precontemplation stage. Four participants in the no mentor group were not included during the analysis of data on stages of change due to being the only participants classified in the precontemplation stage after the pretest.

Participants were assigned an individual change score (post-test stage of change – pretest stage of change). The change scores were grouped for each level of the independent variable (mentor and no mentor groups) by assigned stage of change discussed previously (Contemplation, Preparation, Action, and Maintenance). Group means for individual change scores were then calculated for the mentor group and no mentor group at each stage of change (Table 7). Frequency distributions for individual change scores are provided (Figures 1-4) for the contemplation, preparation, action, and maintenance stages.

Table 7

Mean Change Scores for Each Stage of Change

Variable	<u>Stage of Change</u>			
	Contemplation	Preparation	Action	Maintenance
Mentor	1.235	0.850	0.000	-0.438
No Mentor	1.217	0.455	-0.857	-0.652

Figure 1

Frequency Distribution for Change Scores of Participants in the Contemplation Stage at

Pretest

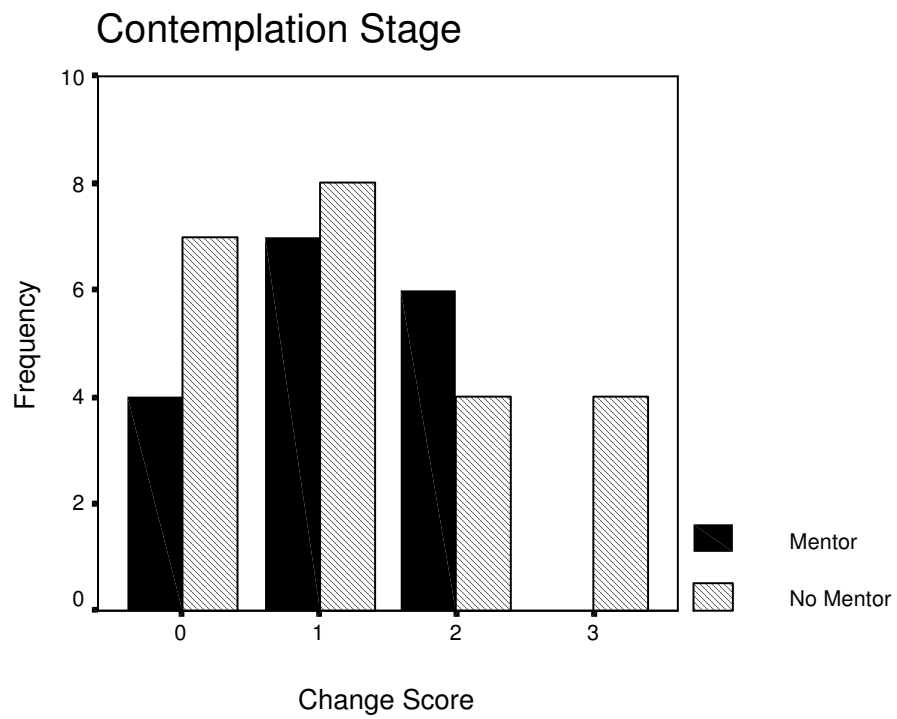


Figure 2

Frequency Distribution for Change Scores of Participants in the Preparation Stage at

Pretest

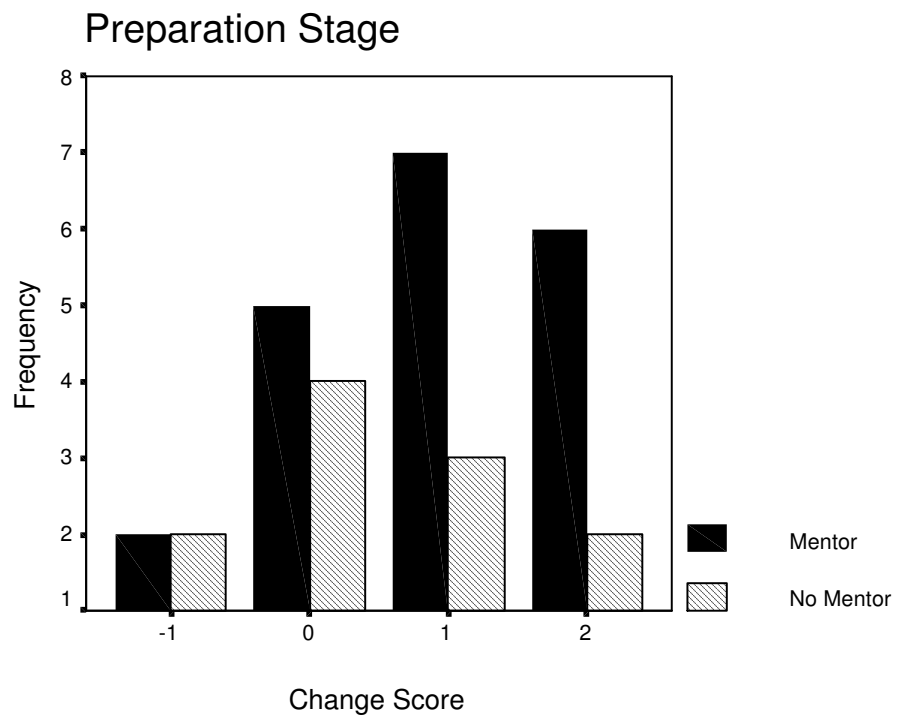


Figure 3

Frequency Distribution for Change Scores of Participants in the Action Stage at Pretest

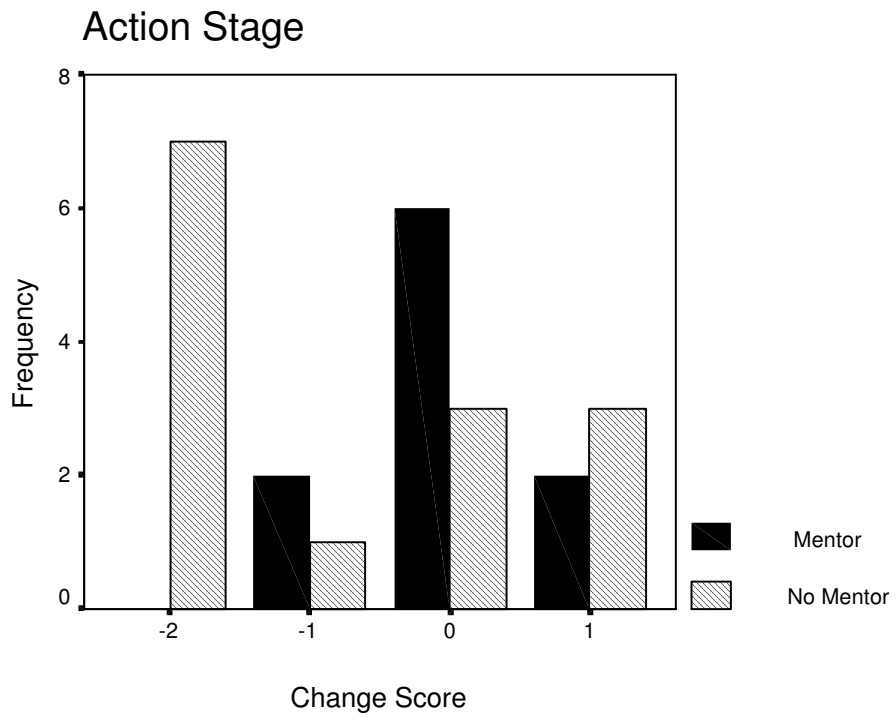
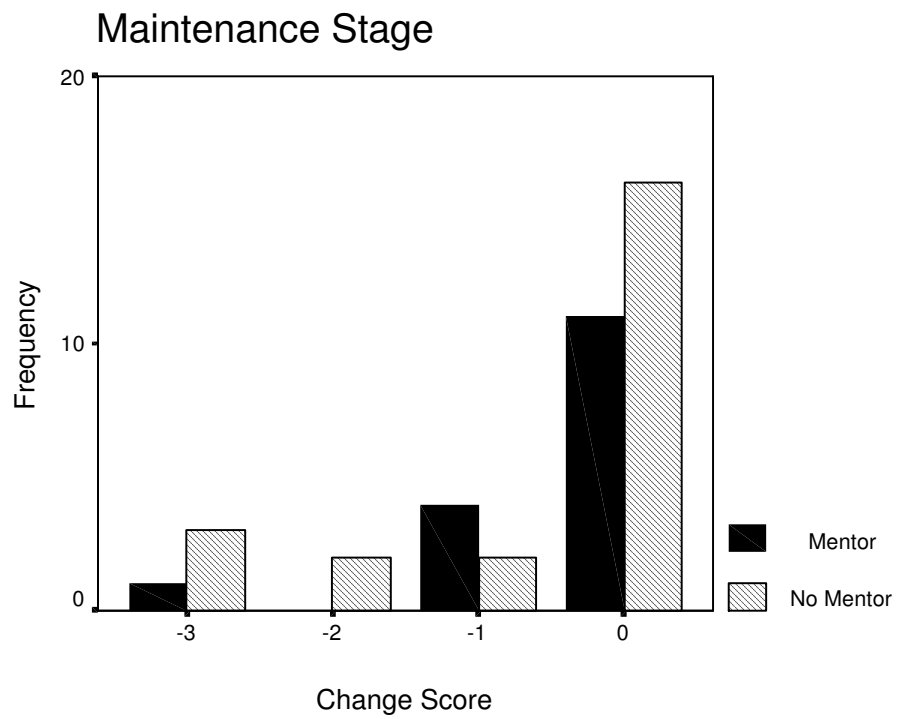


Figure 4

Frequency Distribution for Change Scores of Participants in the Maintenance Stage at

Pretest



Research Question 4

For research question four (Do differences exist in the progress through stages of change between the mentor and no mentor groups?) independent t-tests were completed comparing both levels of the independent variable (mentor and no mentor groups) by the dependent variable of mean change score while being grouped by pretest stage of change (Table 8).

The independent t-tests do not indicate any significant differences exist between the mentor and no mentor groups at any stage of change.

Table 8

T-Tests Comparing Mean Change Scores of the Mentor Group and No Mentor Group

Stage of Change	T-test	<i>p</i>
Contemplation	0.055	.96
Preparation	1.048	.30
Action	1.915	.07
Maintenance	0.658	.52

CHAPTER V

CONCLUSION

This chapter highlights how having a peer mentor or not relates to frequency of exercise behaviors and progression through the transtheoretical model's stages of change. Research in the area of exercise adherence is abundant and has shown that a variety of factors affect exercise behaviors. This study focuses on the utilization of peer mentors in facilitating healthy change. This chapter includes the results and conclusions that were derived from responses of 138 participants to the Health Behaviors Assessment. The results and concerns are discussed in relation to their implications for both theory and practice. Finally, limitations of the present study are outlined and recommendations for future research are discussed.

The first research question (Do participants in this program increase their frequency of exercise behaviors?) centers on each participant's changes in frequency of various exercise behaviors. The question was intended to assess the effectiveness of the interventions implemented in this study for increasing the frequency of exercise behaviors for all participants involved in the program. According to the results of this study, stretching, strengthening/toning, and overall physical activity behaviors were increased as a result of the interventions employed. The results of this research indicate high intensity physical activity, low intensity physical activity, and the frequency of walking or bicycling for a minimum of 30 minutes at a time were not significantly impacted as a result of the interventions.

For participants in both mentor and no mentor groups, frequency of stretching, strengthening exercises, and overall physical activity increased. There was no significant effect for high intensity physical activity, low intensity physical activity, and walking or bicycling for a minimum of 30 minutes at a time. It appears the more general categories of exercise behavior were positively affected by the overall intervention. The US Surgeon General has emphasized moderate, regular physical activity in the maintenance of health status and high quality of life (US Department of Health and Human Services, 1996). The results of this study show an increase in the frequency of moderate physical activity, which has been promoted by numerous agencies. So this method of intervention may be helpful to include in programs attempting to implement the US Surgeon General's recommendations.

The second research question in this study (Do differences exist in the frequency of exercise behaviors between the mentor and no mentor groups?) utilized six items on the Health Behaviors Assessment that measured six different exercise behaviors. The results indicate significant interactions between the mentor and no mentor groups and time for stretching and overall physical activity. The interaction effect on strengthening behaviors approached significance. The results suggest the participants with a peer mentor increased stretching and overall physical activity significantly more compared to participants without a peer mentor. The differences in increases on the strengthening exercises were not significant, however they approached significance. The results of this research indicate no significant interaction effect between the mentor and no mentor groups and time on high intensity physical activity, low intensity physical activity, and the frequency of walking for bicycling for a minimum of 30 minutes at a time.

Further analysis demonstrated that the mentor group significantly increased frequency of stretching, strengthening, and overall physical activity. The no mentor group significantly increased stretching behaviors. The mentor and no mentor groups were then compared utilizing the frequency of these exercise behaviors at pre test and at post test. The mentor and no mentor groups were not significantly different on any of the three measures at pretest. Significant difference existed between the mentor group and no mentor group at posttest on stretching. Significant difference also existed between the two groups on strengthening, however, this must be interpreted with caution due to the results of the overall interaction effect only approaching significance.

The current research supports that of Gershon (1999), as well as Morrissey and Helfrich (1996), with the use of peer mentors and increases in desired behaviors. Gershon (1999) examined the perceived effectiveness of a peer-mentoring program and the peer mentors' influence on the adjustment of first-year college students. Protégés who met with their assigned mentors once per week or more scored significantly higher in areas of social adjustment and college attachment than did other protégés and the non-participants surveyed. Morrissey and Helfrich (1996) examined the use and potential effectiveness of peer-mentoring programs for first-year student athletes at the University of Delaware. Their program matched multiple small groups of first-year student athletes with three or four upper-class mentor student athletes. Qualitative measures through interviews of the freshman indicated the program was useful in assisting successful transition during their first year at the university. Consistent with this previous research, participants working with peer mentors in the current study had significantly higher gains

than the no mentor group on stretching and overall physical activity, while having a marginally significant greater increase on strengthening/toning exercise frequency.

The third and fourth research questions focus on the progression of the participants through the transtheoretical model's stages of change (Do participants in this program progress across the transtheoretical model's stages of change? & Do differences exist in the progress through stages of change between the mentor and no mentor groups?). Participants were assigned an individual change score (post-test stage of change – pretest stage of change). The change scores were grouped for each level of the independent variable (mentor and no mentor groups) by assigned stage of change discussed previously (Contemplation, Preparation, Action, and Maintenance). Group means for individual change scores were then calculated for the mentor group and no mentor group at each stage of change

Participants in both the mentor and no mentor groups that were assessed to be in the contemplation stage at pretest demonstrated a positive mean change score. Participants in both the mentor and no mentor groups that were assessed to be in the preparation stage at pretest also demonstrated a positive mean change score. Participants in the mentor group who began in the action stage displayed no mean change score while the participants in the no mentor group demonstrated a negative mean change score, thus regressed in their stage of change. Participants in both the mentor and no groups who were in the maintenance stage at pretest had a negative mean change scores and demonstrated regression in their stage of change. When the mentor and no mentor groups mean change scores for each stage of change were examined using t-tests, no significant differences were found.

Previous research suggests that the action stage tends to be the least stable stage and have the highest probability for relapse (Prochaska et al., 1992). Action is the stage in which individuals modify their behavior, experiences, or environment in order to overcome what has kept them from their exercise goals. Action involves the most overt behavioral changes and requires considerable commitment of time and energy. The action taken by individuals can erroneously be attributed to change before that change has been consistently implemented into the individual's life. As a consequence, they overlook the requisite work that prepares changers for action and the important efforts necessary to maintain the changes following action. As is now well-known, most people taking action to modify exercise behaviors do not successfully maintain their gains on their first attempt. Relapse and recycling through the stages occur quite frequently as individuals attempt to modify exercise behaviors. People can progress from contemplation to preparation to action to maintenance, but most individuals will relapse and regress to an earlier stage.

While the mentor group did not demonstrate a positive average change score for participants in the action stage at pretest, they also did not demonstrate regression. However, the participants in the no mentor group did have a negative mean change score for the action stage. Furthermore, while there was not a significant difference in the change scores between the mentor and no mentor groups in the action stage the difference was approaching significance. The action stage is a pivotal time in addressing exercise adherence and the intervention of providing a peer mentor could reveal different results if given more time.

Marcus and colleagues (1992) research with adults showed 30% of participants in the contemplation stage at the baseline and 61% of those in the preparation stage progressed into the action stage. Additionally, 31% of the participants in the contemplation stage progressed into the preparation stage. The current research also demonstrated positive average change scores for participants in the contemplation and preparation stages, but it did not show a significant difference in progression between the mentor and no mentor groups. The current research also supports the conclusion Rodgers, Courneya, and Bayduza, (2001) that the transtheoretical model is found to be effectively applied to university students. These researchers compared the utilization of the transtheoretical model with three populations while investigating exercise behaviors. They found the college students to be an appropriate population with which to apply the transtheoretical model. Participants in the current research who were in the contemplation and preparation stages at pretest were able to demonstrate progress. However, no interaction effect was found to support the use of peer mentors providing a significantly greater impact in progression through the transtheoretical model's stages of change with respect to exercise behaviors.

Implications for Practice and Theory

This study has important implications, particularly as it relates to the use of peer mentors in increasing the exercise behaviors of the university population. While a great deal of research supports the idea of matching intervention strategies to stage of change and the use of peer mentors to increase desired behaviors, the need for examination into the use of peer mentors to facilitate change across the transtheoretical model's stages of change was present.

Researchers have found support in matching intervention strategies to the stage of change (Marcus, Banspach, Lefebvre, Rossi, Carlton, & Abrams, 1992). Marcus and colleagues (1992) studied the transtheoretical model and also support matching intervention strategies to an individual's stage of change. They concluded this matching influences their progression through these stages to produce positive long-term behavior modification. Cardinal and Kosma (2004) found behavioral and cognitive processes of change and self-efficacy to be significant contributors in the prediction of stage of change for muscular fitness-promoting behaviors. Rodgers, Courneya, and Bayduza, (2001) provided support for the use of the transtheoretical model across age groups. The current research found participants in the contemplation and preparation stages progressed, while the maintenance stage regressed for both the mentor and no mentor group. The mentor group in the action stage had no change, while the no mentor groups regressed. In looking at the outcome of the current research it appears there are conflicting results on the usefulness of peer mentors in the area of exercise behaviors. Participants in the current study demonstrated significantly different results with frequency of exercise behaviors, while no such differences existed with respect to stages of change.

Possible explanations exist for this apparent discrepancy. The mentor group was able to demonstrate a significant improvement over the no mentor group in overall physical activity, but not in high intensity exercise behaviors. It is possible the participants associated the exercise participation questions related to stages of change with the participation in high intensity exercise behaviors. Regular exercise was defined as a minimum of three times per week for a minimum of 20 minutes per workout for the questions related to stages of change on the Health Behaviors Assessment (Newton, Kim,

& Newton, 2006). The item assessing overall physical activity was as follows: During the past seven days, on how many days were you physically active for a total of at least 30 minutes per day? (Add up all the times you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.). This item asks participants to add up all physical activity throughout the day while the definition of regular exercise pertaining to stages of change specifies a minimum of 20 minutes per workout. It is possible that participants may have broken up their physical activity in increments smaller than 20 minutes at a time, but still were involved in more than 30 minutes of exercise per day. Participants may have not believed they fit the definition of regular exercise due to exercising less than 20 minutes at a time and answered the items associated with stages of change according, while still participating in a minimum of 30 minutes of overall exercise behaviors per day on a more frequent basis. If this were the case, the participants would demonstrate an increase in overall exercise behaviors while not progressing through the transtheoretical model's stages of change.

Review of the literature shows that characteristics of effective mentors include being encouraging, supportive, nonjudgmental, and a confidante (Reglin, 1997; Zachary, 2000; Zey, 1984). Mentors serve as a source of support. A mentor is an individual who teaches, sponsors, and guides a protégé into new areas while acting in a supportive role and providing vision (Vidoni et al., 1988). Effective mentors have goals, commitment, realistic or high expectations, flexibility, respect for an individual's rights, firmness, supportive techniques, and good listening skills (Boyle & Boice, 1998; Wunsch, 1994). The recognition of specific goals and activities necessitates specific training for the process of mentoring (Wunsch, 1994). Mentor training generally includes three

objectives: to explain the goals of the mentoring program and outline the needs of the protégés; to establish mentoring ground rules and procedures; and to develop mentoring skills (Golden & Sims, 1999). The objectives of the program should be passed to the mentors through an informal and interactive training style. Providing case studies or role playing examples have proven effective means in training mentors (Miller, 2002). Part of a mentor's training should include self-assessment. The assessment should be followed by a clear explanation of the role the mentor will play. At this time the mentor is able to determine which skills could use honing in order to fulfill the demands of the mentoring relationship (Zachary, 2000). In addition to the assessment of skills and the provision of a clear role definition, a component recommended for mentor training includes codes of practice. Mentors should receive clear guidelines to acceptable behaviors when dealing with their protégés (Miller, 2002). The peer mentors training sequence addressed these areas and emphasized the importance of using this knowledge during the implementation of the program.

The peer mentors involved in the current research went through a 16 hours of training before the exercise program was implemented. Peer mentors used these guidelines meeting recommendations set out in previous literature. In line with these guidelines, specific training factors can influence participation in physical activity. Mentors utilized the FIT principle, discussed previously, (Berger & Motl, 2000) with participants in an attempt to increase the chances of success. The definition of regular exercise in the Heath Behaviors Assessment (Newton, Kim, & Newton, 2006) employed in this study included a minimum of three times per week for a minimum of 20 per day workout, which adheres to guidelines outlined in the literature. Peer mentors involved in

this study were trained to provide what research has shown to be effective mentoring. Despite this training, the results from this study are mixed. Participants with peer mentors did demonstrate a significantly greater increase in exercise behaviors, but they did not demonstrate a significantly different progression through stages of change.

Limitations

Limitations are present in this study. The first is the use of self-report questionnaires. When dealing with self-report questionnaires, researchers have to rely on accurate assessment from the participants. It is possible participants could misrepresent the frequency of their participation in exercise behaviors for various reasons. The group with peer mentors plausibly could be more prone to this happening in hopes of making a favorable impression on their mentor.

The lack of a control group is also a limitation to this study. This study does allow for comparison between two experimental groups, but does not have a control group to compare with participants that had no type of treatment.

The length of the study is another limitation. The time limitation of only eight weeks did not allow a participant to progress into the maintenance stage unless that individual had been in the action stage for four months before the program began. This poses problems when studying the progression through the transtheoretical model's stages of change. This limitation could be part of the explanation for the peer mentors' lack of significant impact on participants' progress through the stages of change.

Implications for Future Research

The area of exercise adherence is very important when the benefits are so widely publicized and such a large number of people continue to lead a sedentary lifestyle. The

maintenance stage of the transtheoretical model had been associated with long-term exercise adherence and the benefits that come with the active lifestyle. It is appropriate for researchers to continue to focus on interventions that assist individuals in progressing to the maintenance stage.

The peer mentor group in the current study demonstrated a significantly greater increase in frequency of overall physical activity and stretching behaviors than the no mentor group, however the mentor group did not demonstrate any significant differences with regard to progression through the stages of change. These results appear to conflict with each other because it seems if overall physical activity is significantly increasing than participants will also be progressing through the stages of change. It is important to remember that participants who were in the contemplation and preparation stages did demonstrate positive group mean change scores, though no significant differences existed between groups. It seems to warrant further research to provide more conclusive results.

Various possibilities exist that could explain the reason peer mentors did not have a significant effect on progression through stages of change. Possible explanations include inaccuracies by the participants' self-reports at pretest or posttest. Participants could have been inconsistent in their recollection while answering questions related to stages of change. They could have been inaccurate when answering questions over longer periods of time, as opposed to the frequency of exercise behavior questions that asked about participation within the past week. Timeframe also could have a differing effect on the portion of this study pertaining to stages of change than it did on frequency of exercise behavior. As was discussed in the limitations, the eight weeks this study took place did not provide participants the amount of time required to progress into the

maintenance stage unless they had already been in the action stage for four months. The amount of time would not play a significant role in reporting frequency of exercise behaviors as it does with stages of change.

It does seem important to investigate this area of exercise further. Research has shown the transtheoretical model to be appropriate for use with the college population. The current research provided support for the use of peer mentors in increasing overall physical activity and stretching behaviors. This specific intervention could still be beneficial in assisting the college population progress through the transtheoretical model's stages of change. Extending the timeframe of the intervention to a minimum of seven to eight months could provide participants an opportunity to progress through the stages of change and reach maintenance. While this would likely increase the dropout rate for the study it could provide important long-term data on the effectiveness of utilizing peer mentors as an intervention.

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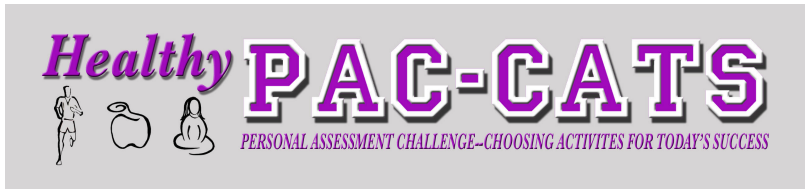
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APPENDICES

APPENDIX A
HEALTH BEHAVIORS ASSESSMENT



Demographic Information

1. Please enter your name. (Your name will not be associated with survey research and dissemination of data.)

First Name

Last Name

2. How old are you?

- 18 years old
- 19 years old
- 20 years old
- 21 years old
- 22 years old or older

3. What is your gender?

- Female
- Male

4. Are you a full-time student?

- Yes
- No

5. How do you describe yourself?

- White-non Hispanic
- Black-non Hispanic
- Hispanic or Latino

- Asian or Pacific Islander
- American Indian or Alaskan Native
- Multi-racial
- Other

6. Where do you currently live?

- Residence hall
- Fraternity or sorority house
- Other university/college housing
- Off-campus house or apartment
- Parent/guardian's home

7. Are you a member of a social fraternity or sorority?

- Yes No

8. How many hours a week do you work for pay?

- 0 hours
- 1 to 9 hours
- 10 to 19 hours
- 20 to 29 hours
- 30 to 39 hours
- 40 hours or more

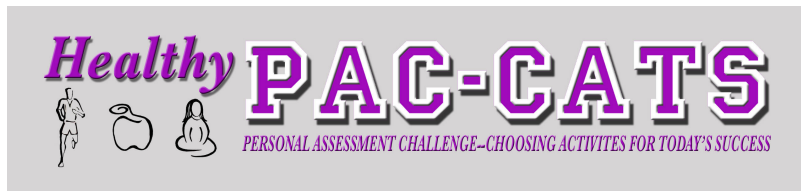
9. How tall are you in inches? (Example: 4'8"=56", 5'=60", 5'3"=63", 5'6"=66", 5'10"=70", 6'=72", 6'2"=74")

"

10. How much do you weigh in pounds?

lbs.

Next | Reset



Weight Loss Practices

11. During the past 30 days, did you diet to lose weight or to keep from gaining weight?

Yes No

12. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?

Yes No

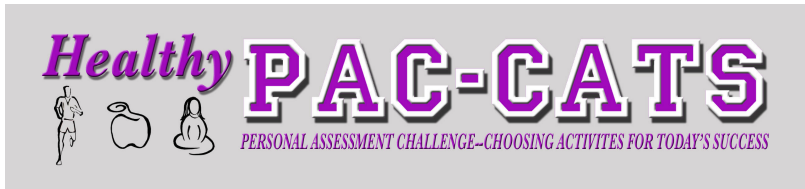
13. During the past 30 days, did you vomit or take laxatives or diuretics to lose weight or to keep from gaining weight?

Yes No

14. During the past 30 days, did you take diet pills or other commercial weight loss products to lose weight or to keep from gaining weight?

Yes No

Next



Nutrition

Please note: In the following questions, one "time" of eating a food refers to consuming a standard serving of that food item (such as 1 whole apple, 1 cup of cooked or raw vegetables, 1 slice of bread, or 1 cup of beverage.)

15. On a typical day, how many times do you eat fruit?

16. On a typical day, how many times do you drink 100% fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, Fruitopia, iced tea, Sunny D, or sports drinks such as Gatorade or Powerade.)

17. On a typical day, how many times do you eat green salad?

18. On a typical day, how many times do you eat other vegetables? (Do not count green salad.)

19. On a typical day, how many times do you eat foods that are high in fat and/or cholesterol (i.e., fatty meats, full-fat cheeses, fried foods, butter, whole milk, ice cream, eggs, or high fat snacks and baked goods)?

20. On a typical day, how many times do you consume low-fat or fat-free dairy foods, such as milk, yogurt, or cheese?

21. On a typical day, how many times do you eat whole grain foods (i.e., whole grain bread, brown rice, whole grain pasta, or whole grain cereal)?

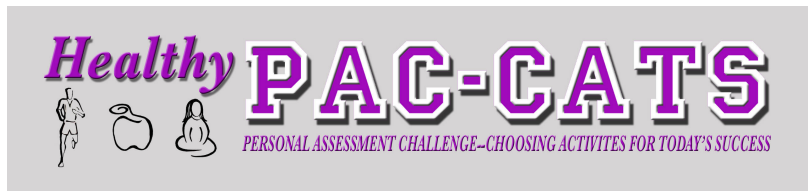
22. On a typical day, how many ounces of regular pop/soda do you drink? Do not include diet pop/soda. (1 vending machine bottle of soda= 16 oz.)

23. On a typical day, how many ounces of caffeinated drinks do you drink? (Include coffee, tea, soda, and energy drinks.)

24. On a typical day, how often do you drink sweetened drinks such as Hawaiian Punch, lemonade, Kool-Aid, Fruitopia, sweet tea, Sunny D, Snapple, or sports drinks such as Gatorade or Powerade. Do not count 100% fruit juice.

25. How many drinks of alcohol do you usually have during a typical week? (Note: 1 drink of alcohol=12 oz. of beer, 5 oz. of wine, or 1 oz. of liquor.)

Next Reset



Physical Activity

26. On how many of the past 7 days did you exercise or participate in sports activities for at least 20 minutes that made you sweat and breathe hard, such as basketball, jogging, swimming laps, tennis, fast bicycling, or similar aerobic activities?

27. On how many of the past 7 days did you do stretching exercises, such as toe touching, knee bending, or leg stretching?

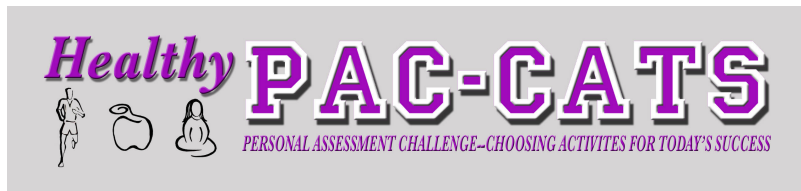
28. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?

29. On how many of the past 7 days did you walk or bicycle for at least 30 minutes at a time? (Include walking or bicycling to or from class or work).

30. On how many of the past 7 days did you participate in physical activity for at least 30 minutes that did NOT make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?

31. During the past 7 days, on how many days were you physically active for a total of at least 30 minutes per day? (Add up all the times you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.)

Next Reset



Stage of Change - Exercise

** Please note: For questions #32 through #35 below, please choose YES or NO to each question using the following definitions of "exercise" and "regular."

"Exercise" includes activities such as power walking, jogging, swimming, aerobic dancing, biking, rowing, weight lifting, volleyball, basketball, tennis, etc. Activities that are primarily sedentary, such as bowling or playing golf with a golf cart, would not be considered exercise.

"Regular" exercise means 3 times or more per week for 20 minutes or longer each time.

32. I currently exercise.

Yes No

33. I intend to exercise in the next 6 months.

Yes No

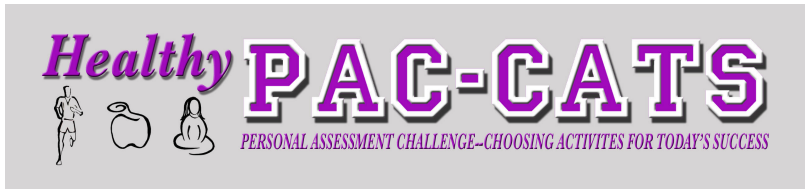
34. I currently exercise REGULARLY.

Yes No

35. I have exercised REGULARLY for the past 6 months.

Yes No

Next Reset



Stage of Change- Fruit and Vegetable Consumption

36. How many servings of fruit and vegetables do you usually eat each day? A serving is 1 cup of cooked vegetables, 1 cup of salad, 1 piece of fruit, 1 cup of 100% fruit juice.

37. Do you intend to start eating 5 or more servings of fruits and vegetables a day in the next 6 months?

Yes No

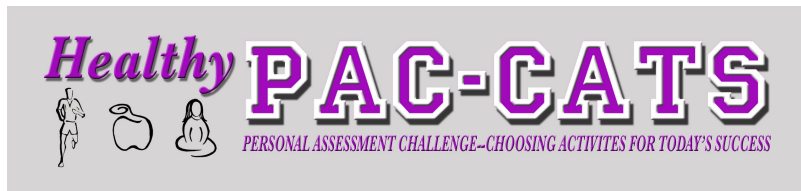
38. Do you intend to start eating 5 or more servings of fruits and vegetables a day in the next 30 days?

Yes No

39. Have you been eating 5 or more servings of fruits and vegetables a day for more than 6 months?

Yes No

Next



Stress Management

40. I organize time each day in order to accomplish personal, social, academic, and work activities that need to be completed.
- rarely
 - sometimes
 - half of the time
 - more frequently than not
 - most of the time
41. When unexpected interruptions or distractions happen to me, I am able to make adjustments and still get my necessary tasks done.
- rarely
 - sometimes
 - half of the time
 - more frequently than not
 - most of the time
42. When I feel stressed, my eating and/or physical activity behaviors become less healthy.
- rarely
 - sometimes
 - half of the time
 - more frequently than not
 - most of the time

43. I use healthy ways to relieve the tension and anxiety that may occasionally build-up in me.

- rarely
- sometimes
- half of the time
- more frequently than not
- most of the time

44. I stay positive in my attitudes and thoughts about tasks and objectives I want to achieve.

- rarely
- sometimes
- half of the time
- more frequently than not
- most of the time

45. When thinking about or taking on a new endeavor, I am able to create a very clear picture of my goals and what I need to do to reach my goals.

- rarely
- sometimes
- half of the time
- more frequently than not
- most of the time

46. When solving a problem I can look at the whole picture and analyze what can be done.

- rarely
- sometimes
- half of the time
- more frequently than not
- most of the time

47. **Please note: In this question, "using stress management" refers to using effective time management, healthy relaxation strategies, and/or positive thinking techniques to deal effectively with stressors in my life.

Which of the following statements best describes you at this present time?

- I have been using stress management for the past 6 months or longer.
- I have been using stress management for less than the past 6 months.
- I intend to use stress management in the next month.
- I am aware of stress management and am thinking of using it in the next 6 months.
- I have little awareness of stress management and have no intention to use it.

48. I get 6 to 8 hours of sleep a night.

- rarely
- sometimes
- half the time
- more frequently than not
- most of the time

49. In most ways my life is close to my ideal.

- strongly disagree
- disagree
- neither agree or disagree
- agree
- strongly agree

50. The conditions of my life are excellent.

- strongly disagree
- disagree
- neither agree or disagree
- agree
- strongly agree

51. I am satisfied with my life.

- strongly disagree
- disagree
- neither agree or disagree
- agree
- strongly agree

APPENDIX B
HEALTHY BEHAVIORS WORKSHEET



Establishing Healthy Behaviors Worksheet

The Establishing Healthy Behaviors Worksheet is designed to carry you through a series of steps that will guide and assist you in establishing healthy lifestyle behaviors or in enhancing ones you do already. The first steps in this process help you identify:

- the area of health that needs your attention
- your behavioral goals pertaining to that area
- people and situations that will help you achieve your goals
- barriers that might prevent you from achieving your goals
- specific action steps to help you achieve your goals.

Once these steps are completed, the final steps help you create ways to:

- monitor the progress toward your goals
- reinforce the progress toward your goals

To design your program, please follow each step in order. You are on your way to establishing and enhancing healthy lifestyle behaviors!

Your Name:

Date:

STEP 1: HEALTH BEHAVIORS ASSESSMENT PROFILE

The Health Behaviors Assessment Profile (HBAP) has given you some information on your behaviors in the areas of physical activity, nutrition, and stress management. The first step to establishing healthy behaviors is to determine which of these areas you want to target. Use your HBAP to help you decide to focus on one or a combination of the three areas. Then, you will want to determine the specific aspect or aspects of that area or areas you will address. For example, after reviewing your HBAP, you may decide you want to focus on the area of physical activity. And within that area you decide you want to improve your resistive exercise behaviors. Or, in the area of nutrition, you may decide to target reducing high fat foods in your diet.

Take some time to review your HBAP and to think about which aspects of the three main areas—physical activity, nutrition, and stress management—you would like to address in your program.

In the following space, briefly describe the aspect(s) of the area(s) you want to address in your program:

STEP 2: SELECTING A TARGET BEHAVIOR AND A GOAL

The next step is to identify and describe a behavior you wish to establish or enhance and the goal or outcome you wish to accomplish for this behavior. Here are some guidelines for selecting the target behavior and the corresponding goal or outcome.

Is the behavior something you really care about?

- Can you say that establishing or enhancing this behavior is important to you?
- Can you say that you will likely be healthier or better off if you establish or enhance this behavior?
- If needed, would you be willing to spend the money necessary to establish or enhance this behavior?

Is it something you are internally motivated to do?

- Be sure the behavior and the goal you set for that behavior are intimately yours and not an agenda that someone else has for you.

Are you able to be specific about the behavior you want to establish or enhance and the related goal or outcome?

- Select a specific part of your lifestyle you want to work on rather than a big, abstract issue that everyone could be interested in.

Examples of behaviors that are too big and general and thus not specific enough are: Lose weight, feel healthier, drink less alcohol, and reduce anger.

Examples of behaviors and goals that are clear and more specific are: improve physical fitness by exercising at least three days a week for 30 minutes, or improve my ability to relax by doing breathing exercises at least four times a day.

Is it possible that you can influence the situation you are concerned about?

- For example: You could say you want to exercise with certain friends at specific times on five days of the week, but your friends' schedules may not allow for this.

Is your goal something that makes you stretch beyond your present level, but is not out of your reach?

- For example: You could decrease your consumption of sugary foods by eating one less dessert or drinking one less soda a day, but not trying to completely eliminate all sugary foods from your diet. Or, you could increase your strength 10%, as measured by a bench press, in the next 60 days, but it would be highly unlikely that you could increase it 50%.

Is your goal something you can count or measure?

- For example: A countable goal could be to create a "to do" list and then prioritize the activities on the list to reorganize it as a "do-able" list each morning. Thus, you can count a

yes or no for each day you make a “do-able” list and also count the number of “do-able” tasks you accomplished in a day.

In the space below, identify your target behavior and describe the goal you want to achieve.

NOTE: After identifying your target behavior and goal, go through the above criteria in Step 2 for selecting a target behavior and goal. If you answer no to any of these questions, you may want to consider choosing another behavior or setting a more achievable goal for your behavior.

STEP 3: MAKING A GOAL STATEMENT

Most behavioral goals can be rephrased so that they can describe two things:

- A. The behavior as it is now (e.g., I currently study five hours a week.)
- B. The behavior as you would like it to be—the goal (e.g., I want to study ten hours a week.)

Restate your behavioral goal briefly, indicating the direction of change you desire.

Poor: I don't study much now and I want to improve the way I study.

Better: Currently, I have no set study schedule; I want to implement, daily, a system that plans and organizes my study time.

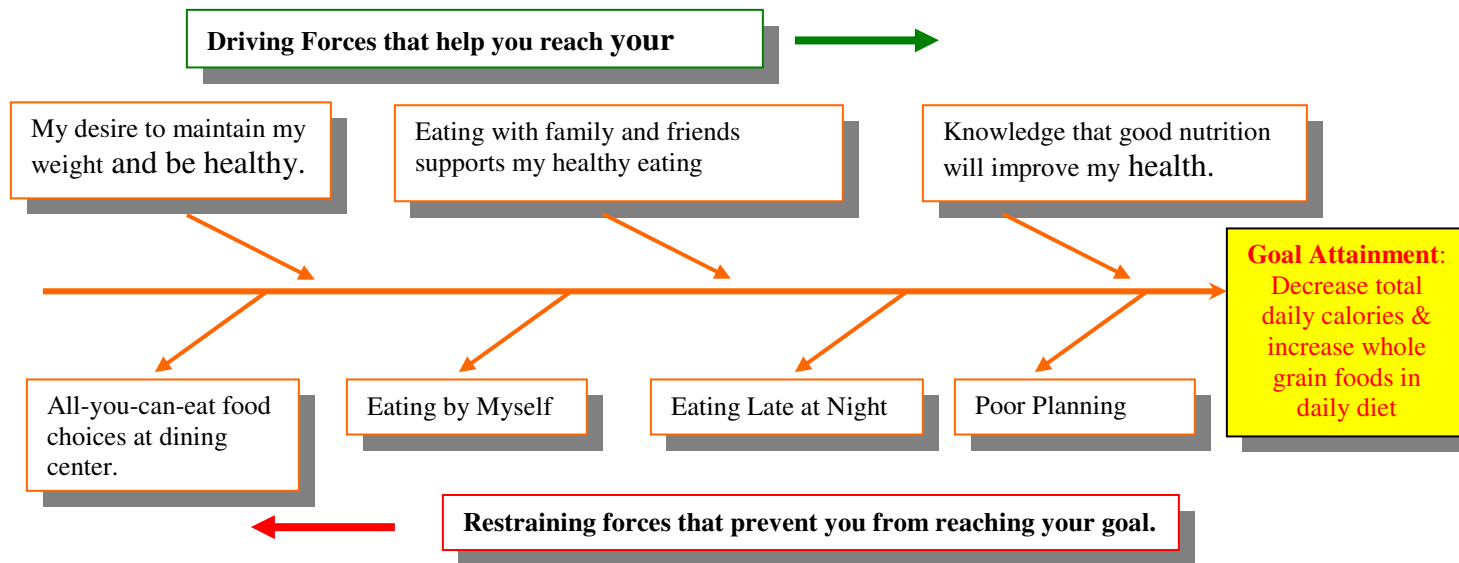
Poor: I am too stressed out; I want to feel relaxed more often.

Better: Most days I do not feel relaxed; I want to increase my ability to relax by doing at least one relaxation technique every night.

Restate your behavioral goal to indicate the positive direction of change:

STEP 4: COMPLETING A FORCE FIELD ANALYSIS

Most behavioral changes can be understood in terms of the forces that help you achieve your goal and the forces that prevent you from achieving your goal. For example, some forces will help improve your overall physical fitness, such as regular cardiovascular exercise, good nutrition, and regular sleep. These are called **driving forces**. Other factors will tend to decrease your fitness, such as excessive alcohol consumption, too many sweets, and watching television while sitting on the couch. These are called **restraining forces (or barriers)**. Furthermore, these forces can be thoughts or emotions (desire to be healthy, e.g.), actions (eating with friends, e.g.), information (knowledge of health benefits of regular exercise, e.g.), or elements in your physical or social environment (abundance of food available at dining center, e.g.).



In the spaces below, write out the DRIVING FORCES and the RESTRAINING FORCES that could affect your progress toward your goal. What are the driving and restraining forces affecting the situation you want to improve? Brainstorm here and try to come up with as many ideas as possible. Consider personality factors, your physical and social environment, social pressures, your academic and work responsibilities, your feelings and thoughts around your goal, informational resources, and any actions or behaviors that could affect progress toward you goal. Again, list everything that comes to mind without being selective. You may weed out irrelevant items later. (For help on how to brainstorm, please see Brainstorm section under Stress Management on Healthy PAC-CATS website).

List Driving Forces that will help you reach your goal:

List Restraining Forces that could prevent you from reaching your goal:

STEP 5: PRIORITIZE THE MOST IMPORTANT DRIVING AND RESTRAINING FORCES

Now review the two lists and pick out those forces which seem to be the most important right now and which you might be able to affect constructively. Identify the two or three most important driving and restraining forces from your list and write them in the spaces below.

Most Important Driving Forces

- 1.
- 2.
- 3.

Most Important Restraining Forces

- 1.
- 2.
- 3.

STEP 6: ACTION STEPS FOR RESTRAINING FORCES

Now, for each of your most important restraining forces, list some possible action steps you can plan and carry out to reduce the effect of the force or to eliminate it completely. For example: If a restraining force against getting up early to exercise is a tendency to sleep through your alarm, you might get a louder alarm, go to bed earlier, or have someone come in to make sure you wake up. Again brainstorm, listing as many possibilities as you can. List below the most important restraining forces you have and brainstorm action steps to minimize them:

Restraining Force 1:

Action steps:

- A.
- B.
- C.

Restraining Force 2:

Action steps:

- A.
- B.
- C.

Restraining Force 3:

Action steps:

- A.
- B.
- C.

STEP 7: ACTION STEPS FOR DRIVING FORCES

Now, for each of the most important driving forces, make a list of actions that will support these forces. For example, if a driving force is encouragement from your friends, then you might write as action steps: Write up an agreement with a friend to encourage me daily and share with me the celebration when I achieve my goal. Ask a friend to check with me by calling once a week. Or, let several friends know what I am trying to do and ask for their support. Outline driving forces and their associated actions steps on the next pages.

Driving Force 1:

Action steps:

- A.
- B.
- C.

Driving Force 2:

Action steps:

- A.
- B.
- C.

Driving Force 3:

Action steps:

- A.
- B.
- C.

Now you have organized the major steps for establishing healthy behaviors!

STEP 8: GOAL ATTAINMENT SCALE (A WAY TO MEASURE PROGRESS)

Goal attainment is a way to measure the progress you are making toward achieving your goal. We recommend that goal attainment use a 4-point scale. On this scale, Level 2 represents your present level of activity (behavior) before you start a program to establish desired behaviors. Level 1 would represent getting worse—that is, your behavior goes in the opposite direction of your goal. Level 3 would represent a noticeable level of improvement, and Level 4 a significant level of improvement. It would look something like this:

Level 4 = significant improvement	Walked for at least 30 minutes six days a week
Level 3 = noticeable improvement	Walked 30 minutes every other day
Level 2 = present behavior	Walked 25 minutes 2 times a week
Level 1 = noticeable decline	Walked 20 minutes 1 time during the week

On the lines below write in a description of the behavior that will serve as the standard for attainment at each level of your goal attainment scale:

Level 4:

Level 3:

Level 2:

Level 1:

You may have more than one activity for which you have set up goal statements. You should do the same scaling for each specified goal.

STEP 9: MONITORING PROGRESS:

Use a daily or weekly tracking chart to record the progress of your wellness program. You should then evaluate your goal attainment at the end of the week, using the scale you devised in the previous step.

Example Tracking Chart

Date	Goal Activity	Goal Attainment Score	Driving Forces Utilized	Restraining Forces	Possible Actions to overcome Restraining Forces and/or enhance Driving Forces
9/13	Walked for 30 minutes once this week.	1	Friend called me once to walk.	Watched TV. Played video games.	Ask friend to call me every time he exercises. Reward myself with 30 minutes of video game playing after walking for 30 minutes.

REWARDING YOURSELF

- Reward yourself appropriately for your accomplishments along the way to your goal.
- At the beginning of your program, reward yourself after every successful action. Then when the target behavior becomes better established, reward yourself less frequently.
- Have in mind rewards that you could give yourself after completing your short-term goal activities as well as accomplishing your long-term goal.
- Rewards can be anything from savoring feelings of satisfaction, to spending time with friends, to a new music CD.
- Just make sure rewards are appropriate to the accomplishment and that they don't create a problem situation for you.

MAKING ADJUSTMENTS

- Review your tracking chart after you are into your program for a week or two. Assess how successfully your program is going. Determine if you need to reconsider the driving and restraining forces and the action steps you set up to either support or overcome them, respectively. You may find that restating your goal statement for your target behavior is necessary. Making adjustments is part of the process. Keep in mind; persistence is important

to establishing healthy behaviors.

GOOD LUCK!

APPENDIX C
PHYSICAL ACTIVITY LOG

_____ Date _____ Day # _____ Day of the Week

Physical Activity

Description	Hrs/Min	Intensity			Calories Burned
		Low	Med	High	
					Total:

Notes: _____

Total Calories taken in vs. expended:

$$\begin{array}{r}
 \underline{\hspace{2cm}} \\
 \text{Total Eaten}
 \end{array}
 -
 \begin{array}{r}
 \underline{\hspace{2cm}} \\
 \text{Total Expended}
 \end{array}
 -
 \begin{array}{r}
 \underline{\hspace{2cm}} \\
 \text{BMR}
 \end{array}
 =
 \begin{array}{c}
 \boxed{\hspace{2cm}} \\
 \text{Total Caloric Surplus/(Deficit)}
 \end{array}$$

Use this physical activity log, or go online to find other exercise logs and more physical activity information! Here are some accredited fitness websites:

<http://www.changingshape.com/exercise/journal/>

<http://www.fitday.com>

<http://www.fitwatch.com>

VITA

Trevor Richardson

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE DIFFERENCES IN PROGRESS THROUGH STAGES OF CHANGE IN EXERCISE BEHAVIOR BETWEEN COLLEGE STUDENTS WITH AND WITHOUT PEER MENTORS

Major Field: Educational Psychology: Specialization in Counseling Psychology

Biographical:

Personal Data: Born in Council Bluffs, Iowa, on November 20, 1975, the son of Terry and Marlene Richardson, brother of Todd and Rachel Richardson and Jill and Jonathan Rone, and engaged to be married to Dr. Tamara Young.

Education: Graduated from Riverside High School, Oakland, Iowa in May 1994; received a Bachelor of Arts degree in Psychology from Central College, Pella, Iowa in 1998; received a Master of Science degree in Counseling and Student Personnel from Oklahoma State University, Stillwater, Oklahoma in 2001. Completed the requirements for the Doctor of Philosophy degree with a major in Educational Psychology: Specialization in Counseling Psychology at Oklahoma State University, Stillwater, Oklahoma in December 2007.

Experience: Worked as a practicum student: at the Oklahoma State University Student Counseling Center; at Payne County Youth Services; and again at the Oklahoma State University Student Counseling Center. Completed the year-long psychology internship at Kansas State University-Counseling Services.

Professional Memberships: American Psychological Association

Name: Trevor Richardson

Date of Degree: May, 2008

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: THE DIFFERENCES IN PROGRESS THROUGH STAGES OF
CHANGE IN EXERCISE BEHAVIOR BETWEEN COLLEGE
STUDENTS WITH AND WITHOUT PEER MENTORS

Pages in Study: 116

Candidate for the Degree of Doctor of Philosophy

Major Field: Educational Psychology: Specialization in Counseling Psychology

Scope and Method of Study:

This research was an exploratory study designed to examine the relationship between participants with a peer mentor versus those without a peer mentor and exercise behaviors. The application of the transtheoretical model (Prochaska, DiClemente, & Norcross, 1992) was put in place to assess the participants' progress across the stages of change as applied to exercise behavior. Participants were 138 college students who completed an eight-week intervention. The Health Behaviors Assessment (Newton, Kim, & Newton, 2006) was developed for this research and provided measures for both frequency of exercise behaviors and stage of change.

Findings and Conclusions:

It is well documented that younger people have become increasingly inactive in recent years (US Department of Health and Human Services, 1996) despite the health benefits resulting from regular exercise. Research has found support for matching intervention strategies to the stage of change for exercise behavior (Marcus, Banspach, Lefebvre, Rossi, Carlton, & Abrams, 1992). The main findings from this study are that participants assigned a peer mentor were able to increase overall exercise and stretching behaviors significantly more than participants without a peer mentor. However, no significant differences existed between the groups with respect to progress through the transtheoretical model's stages of change. Implications of this study and future directions for research are discussed.

ADVISOR'S APPROVAL: ~~John Romans, Ph.D.~~ _____