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Adolescent Values and Exercise Behaviors

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Adolescent Values and Exercise Behaviors

by

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Presented to the Faculty of the
Graduate Department of Clinical Psychology

George Fox University

in partial fulfillment

of the requirements for the degree of

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Newberg, Oregon

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Adolescent Values and Exercise Behaviors

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Adolescent Values and Exercise Behavior

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Abstract

In recent decades, there has been a significant increase in adolescent obesity in America (Mayo Clinic, 2006). Given this, there is a corresponding need to develop targeted adolescent obesity interventions. The current study examined how a psychosocially based intervention impacted adolescents' perceived *value*, *frequency*, and *amount* of exercise. Participants included 55 adolescents, (28 male, 26 female) ranging in age from 15-18. Separated by class, the three groups included one control group and two separate intervention groups. All groups completed an Exercise Checklist (Anshel, 2006), measuring the value, frequency, and amount of exercise prior to any intervention. Classes then received different levels of the intervention including a psycho-educational presentation and three-week exercise challenge. Exercise value, frequency, and amounts were re-assessed at weeks three, six, and a twelve. Findings showed that an adolescent's value, frequency, and amount of exercise increased post intervention. Overall, this indicates that when educated about the psychological benefits of exercise, and then

challenged to choose a reasonable exercise regime, adolescents are more likely to value exercise and increase the amount of times they exercise on a weekly basis.

Acknowledgments

This work is dedicated to my large support system comprised of family, friends, and George Fox University faculty. My parents, who have modeled that continued education is attainable and supported personal adolescent sport endeavors. Lastly, this is dedicated to my husband, who has fostered my health/exercise passions by encouraging exercise as a form of recreation, ministry, and emotional health.

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Chapter One

Introduction

Over the last several decades, American society has become increasingly overweight encompassing approximately 66% of the American population (Center for Disease Control [CDC], 2004). This statistic has not left our children and adolescents untouched; their risk of obesity continues to rise (Eaton et al., 2006). Given that obesity has proven to have significant medical, social, and emotional consequences; early intervention is essential. Interventions developed specifically for America's youth are of significant importance given that lifetime habits are at the beginning stages of development.

To combat the growing obesity epidemic, a significant amount of research has been performed to attempt to understand its complex dynamic. Findings indicate that a variety of interacting factors influence obesity including: nutrition, peer influence, parental/genetic influence, public education influence, comorbid medical conditions, mood/self construct and overall lifetime habits (Mayo, 2006). Given its multifaceted etiology, it has been difficult to determine which factors to emphasize in the development of an intervention. Although early intervention is essential, the adolescent formula for success has yet to be developed.

Statistics on Adolescent Obesity

In a study done by the Center for Disease Control (2005), findings indicate that “one in three American children born in 2000 will develop diabetes in their lifetime.” Correspondingly, they found that children who are overweight or obese are more likely to be overweight or obese as adults. In America today, “approximately 16% of children and adolescents ages 6-19 years are overweight” and “the prevalence of overweight among children aged 6-11 years has more than doubled in the past 20 years, and among adolescents aged 12-19 has more than tripled (CDC, 2005).” All of this research points towards an increase in the number of obese adolescents and a need for change in children’s nutrition and exercise habits.

Studies on Adolescent Nutrition

Nutrition is a major contributor to obesity. According to Ackard, Neumark-Sztainer, Story, and Perry (2003); “studies have found that objective overeating is prevalent among adolescents and has been linked with problematic weight-related behaviors and psychological challenges.” The Center for Disease Control (2005) reports that nearly eighty percent of adolescents do not eat the daily recommended amount of fruits and vegetables—important contributors to daily nutrition.

In addition to youth not consuming foods that contain adequate sources of nutrition, they are continuing to seek foods that are high in fat and low in nutritious value. The amount of soda pop being consumed by the adolescent population has dramatically increased over the past three decades. More specifically, female adolescent soda pop consumption has almost doubled from 1978-1998, and almost tripled in males from seven ounces to nineteen ounces a day (CDC, 2005). The repercussions of an increase in soda

pop ingestion are that one will likely decrease their water intake while adding calories to their diet without receiving any nutritional value from the beverage. Currently, high caloric foods and beverages are highly accessible and typically less expensive in the American culture (Horgen & Brownell, 2002). In a fast paced life-style, food that one can prepare and eat quickly is an easy alternative to meals higher in nutrition (O'Connor, Jones, Conner, McMillan, & Ferguson, 2008). Therefore, nutritious meals can be more time consuming and expensive, making them more difficult to pursue.

There is a high need for school-based nutritional education (CDC, 1996).

Primarily this is because the public education domain has access to most of the nation's adolescents and children. Half of America's youth eat one in three meals a day at school; one in ten, consumes two out of the three meals they eat a day at school (CDC, 1996). These statistics suggest that the public school system is a prime setting to model healthy eating habits. If schools can provide food options that are high in nutritional value, adolescents are more likely to adopt long-term healthy eating habits.

Studies on Peer Influences

Peer influence has a large impact on one's perception of obesity and associated consequences. During this developmental period, adolescents tend to listen to and value the emotions of their peers more than their parents (Rew, 2005). This easily translates into individuals making similar exercise/eating choices as their community of friends (Salvy et al., 2008).

The adolescent developmental stage of Identity vs. Identity Confusion (Erikson, 1985) involves important conflicts and choices that impact the character development of adolescents. Due to the formation of many basic identity characteristics, this stage is

often the catalyst for habits that are learned and implemented throughout one's lifetime. Therefore, adolescence is a crucial period during which regular habits in nutrition and exercise can be established. Interventions during this period should keep in mind the strength of peer influence and the importance of this crucial developmental stage.

Paxton, Schutz, Wertheim, and Muir (1999) studied friendship clique variables in relation to body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. This study assessed females in groups of three or more, and analyzed their group characteristics as well as eating behaviors. The results indicated that girls within a group were found to have similar body mass index, depression, and self-esteem. Secondly, their study found that negative affect was correlated with increased weight loss concerns. Adolescents tend to mirror one another in their thoughts and actions. This can be seen not only in their personalities, but also in what they choose to eat and whether or not they choose to exercise.

Adolescent boys and girls (grades 7-12) have additionally divulged their thoughts on what ideal exercise activities would look like (Neumark-Sztainer, Martin, & Story, 2000). The results indicated that adolescents advocated for "fun and interactive activities within a supportive environment...offering non-traditional physical activities such as strength training, in-line skating, yoga, and hiking." Adolescents also advocated for having a supportive environment that would help them feel comfortable as they began to learn how to modify their exercise and food intake.

Neumark-Sztainer et al. (2002) found statistically significant associations between weight status and perceived weight-teasing. Very overweight male adolescents were more likely to be teased than very overweight females. Weight teasing by family

members however, was prevalent in 47% of females and 34% of males. Not surprisingly, all of these teens reported that the teasing bothered them. These negative comments and interactions are likely to be contributors to increased weight gain and obesity in the future.

Parental Influence

Parental influence has a significant impact on adolescent obesity including: parental income, education, and modeling of eating/exercise behaviors. Goodman, Slap, and Huang (2003) found that lower household income and lower parental education were associated with almost one third of depression and obesity. The authors reported that two thirds of adolescents live in homes where both parents don't have college educations. Alarmingly, almost half of the adolescents live in homes where parental income falls below the federal poverty threshold. These facts suggest that adolescents' parents may have less knowledge about healthy food behaviors in addition to significantly less financial resources to buy nutritious/healthy foods.

Due to children's unconscious monitoring of their parents eating/exercise habits, parental modeling is an additional factor that contributes to adolescent obesity. Typically, children accept their parents' habits as normal and integrate them into their own lifestyle choices. Neumark-Sztainer (2005) points out that children notice their parents' eating habits and tend to copy them, particularly parental dieting behaviors. If a parent is skipping meals, crash dieting, or not showing up to the dinner table, adolescents are bound to notice, and are more likely to model the same behaviors. This concept can also be generalized to overeating. When children see their parents eating food of poor nutritional value, they are likely not to notice their own similar unhealthy eating habits.

Adolescents who have obese parental figures are more likely to normalize their own obesity. Nutrition education and modeling by the nation's education system may be an important antidote to this poor parental modeling.

Public Education Influence

In recent decades, there has been a decline in the amount of required physical education in the public school curriculum. The Center for Disease Control (2006) states that the amount of students who participate in daily physical education classes have dropped from 42% in 1991 to 28% in 2003. According to the School Health Policies and Programs Study (SHPPS), performed in 2000, "8.0% of elementary schools, 6.4 % of middle/junior high schools, and 5.8% of senior high schools provide daily physical education or its equivalent" (Center for Disease Control, n.d.).

Schools are beginning to exchange physical education with recess in elementary schools (Kohl & Hobbs, 1998). These statistics fly in the face of the research that has proven correlations between exercise and cognitive functioning (Landers & Arent, 2006), and improvement of concentration (Weinberg & Gould, 1999). Although most school officials know that physical activity is important for America's youth; there have been outside stressors to increase "core" class requirements (e.g., No Child Left Behind Act). Studies show that adolescents are able to better perform in class, when an exercise regimen is part of their daily routine (Field, Diego, & Sanders, 2001), yet there is not enough time in the school day to implement all required classes *and* physical education. Essentially, there is a dual need for academics and physical education with not enough time in the school day to satisfy both. This has led to a deficit in our children's

knowledge and experiences related to physical exercise. This likely has a direct connection with the increase in the obesity rate of today's youth.

Mood and Self-construct Influence

Healthy diet and exercise are connected with one's emotional status and self-perception. Jonides, Baschbacher and Barlow (2002) indicate that the widespread consequences of obesity in adolescents are also psychosocial; psychosocial meaning one's psychological status in relation to their environment. This is due to the fact that they are socialized to place more emphasis on external appearance, which in turn leads to dissatisfaction with any type of "non-normative" appearance. Neumark-Sztainer (2005) points out that American society (e.g. media) is asking our youth to do two opposing things: engage in a predominately sedentary lifestyle comprised of a significant amount of food consumption as well as maintain a thin body. The attainment of this ideal is almost impossible and thus leads to psychological distress including: depression, anxiety, stress, and/or low self-esteem (O'Connor et al., 2008). However, even with these emotional consequences, it seems that one rarely changes their current exercise habits. Instead, many adolescents turn to substance abuse, overeating, and higher amounts of screen time (e.g., television, electronic games, and computer use). These activities are frequently portrayed in the media as being socially acceptable and produce quicker all-be-it brief symptom alleviation in comparison with the more long-term benefits of exercise. It is apparent that these unhealthy coping mechanisms are not decreasing negative affect or obesity (Robinson, 1999). Yet adolescents sometimes struggle to make change towards healthier coping techniques. The question to be answered, therefore, is

why aren't adolescents using positive coping skills to combat these psychosocial stressors?

Adolescent interventions focused on psychosocial factors may improve one's self-esteem according to McCabe and Ricciardelli (2003). This study found that children with low self-esteem were more likely to be dissatisfied with their bodies in terms of weight and muscle size. The authors noted that there has not been intervention programs developed that linked exercise to self-esteem, which could improve body satisfaction and foster healthy weight loss behaviors. Levine and Smolak (2001) stated that educational programs need a substantial amount of improvement to have a long-term impact on adolescents, and agree that self-esteem work needs be included.

The University of Minnesota performed an assessment called "Project Eat" which included 4,746 adolescents from 31 public schools in order to gauge the range of "socio-environmental, personal, and behavioral factors of potential relevance to nutritional health and obesity among adolescents" (p. 89). Their findings indicated that interventions that focused on unhealthy weight control behaviors needed to focus on the improvement of body image as well as weight concerns.

Dishman et al. (2005) have done research on adolescents and the correlation between self-efficacy and exercise. Their study found that self-management strategies that build self-efficacy could influence physical activity.

Kohl and Hobbs (1998) showed that attitudes, personal health beliefs and knowledge are key elements to changing physical activity and exercise. However, it is difficult to measure and monitor physical activity accurately. He also points out that schools are the optimal location to implement an intervention, but that if the intervention

is mandatory it is not truly measuring self-efficacy. Given this information, a strategy that involves both the education of the adolescent and the opportunity to choose a physical activity, may be a better measure of true self-efficacy. Adolescents could choose from a variety of exercises or choose not to exercise at all.

The measurement of adolescent values in correlation to exercise behaviors has shown an interesting connection. Torres, Fernandez, and Maceira (1995) measured an adolescent value of health in six areas including nutrition, personal health, mental health, drug abuse, safety, and social well-being. The results indicated that there was a positive correlation to health values and exercise behaviors.

Promotion of Lasting Change

Motivational interviewing (MI) has been proven to be useful in the addiction field and has been increasingly applied to public health and health promotion settings (Rollnick, Mason, & Butler, 1999). This technique encourages individuals to evoke their own concerns about their status, develop insight, and resolve personal ambivalence towards change. Research in this field has proven successful in helping individuals make long-term health changes and therefore is likely a beneficial technique in the commencement of an exercise regime (see Resnicow et al., 2002; Resnicow et al., 2005).

Although initially applied on an individual basis, MI has begun to be proven successful within group settings (Knight et al., 2003; LaBrie, Lamb, Pedersen, & Quilan, 2006). Additionally, MI administered with supplemental non-MI techniques is considered *adapted* MI (AMI) (Rollnick, Heather, & Bell, 1992). For example, if one is motivated towards change in a group setting, one must keep in account any perceived group pressure to make change. Additionally, group work inherently means that the group

facilitator likely speaks more than individual participants in the group. Miller and Rollnick (1995) specify that pure *Motivational Interviewing* needs to be done in a conversational format; again, difficult to achieve within a group setting.

Values-based Exercise Program

The above research on adolescent nutrition, peer influence, parental influence, educational influence, and mood are important contributors to developing a well-rounded adolescent exercise intervention. An effective intervention would focus on the value of exercise in light of education (emotional, nutritional, physical) and support (parental, peer, & educational); all within an adapted motivational interviewing format. Moreover, research shows that it is important to give adolescents' exercise choices while focusing on improving self-efficacy/esteem rather than weight loss. Studies done in the past have taken components of the above, but haven't seemed to consistently reach our increasingly over-weight adolescent population.

The intervention being proposed is one that presents exercise in a fun and interesting way. It outlines the contributors to obesity, numerous reasons to engage in physical activity (emphasis on psychological benefits), and addresses the long-term consequences of not exercising.

In motivational interviewing style, students are encouraged to make arguments for change in their exercise habits. Specifically, they are asked to discuss the reasons that they are currently not exercising and then develop reasons that exercise would be beneficial. Students' ambivalence is then challenged and they are asked to either accept the consequences of a sedentary lifestyle or choose to lead a healthier life (Anshel, 2006).

If successful, this multifaceted approach would help facilitate the improvement of America's adolescent health status across several domains. First, it would increase student's value of the psychological and physical benefits of exercise. Second, it would increase their exercise behaviors (frequency and amount).

The hypothesized results follow:

1. There will be a statistically significant increase in an adolescent's value of exercise from the pre-assessment and post-assessment.
2. There will be an increase in the frequency of physical activity from the Pre-assessment and post-assessments
3. There will be a statistically significant increase in amount (average minutes) of physical activity from the pre-assessment and post-assessments.

Chapter Two

Methods

Participants

Students targeted for the study were volunteers from three public high school health classes in Portland, Oregon. Prior to the study, both parental informed consent and student assent were obtained. In return for their participation, students were given class extra credit along with eligibility to win a prize at the end of the study. Treatment was in accordance with the ethical standards of the American Psychological Association, George Fox University Institutional Review Board, and David Douglas School Board.

Instruments

Several instruments were used to complete this intervention. First, an adapted assessment of adolescent value of exercise, developed by Mark Anshel (2006), was used for the study's pre and subsequent post-assessments (four in total). Additionally, students were asked to report their average weekly frequency (number of days) and amount (average minutes) of exercise.

Second, during the three-week exercise challenge portion of the study, students were asked to fill out a weekly exercise chart, which tracked their weekly participation (See Appendix B). They were also asked to fill out an exercise plan with plausible days and times of the week that they thought they would be able to exercise. On the same

paper, participants are asked to write down three non-weight related goals for the intervention

Procedure

Participants were designated into the three groups according to class with a total of 55 students (Class A = 22, Class B = 13, Class C = 18). This technique ensured a lower likelihood of student awareness of different intervention levels. Upon completion of the intervention, all three classes received all levels of the intervention at different times.

Table 1

Intervention design

	Pre Assessment	3 weeks	Post Assessment	6 weeks	Post Assessment	9 weeks	Post Assessment
Group A		X1 X2		None		X1 X2	
Group B	X1	None	X2	None	None		
Group C	None	X1 X2	None	None	None		

Note. X1 = Psycho-Educational Intervention; X2 = Exercise Challenge

The psycho-educational component was comprised of an interactive presentation outlining the benefits of exercise with a large emphasis on the psychological components (See Appendix B). First, it challenged them to think of activities they do to feel good (emotionally) in order to increase awareness of the relationship between mental health and exercise. Participants were additionally educated about exercise’s impact on one’s emotional health. Lastly, adolescents’ ambivalence was challenged and they were asked either to accept the consequences of a sedentary life-style (by show of hand), or choose a

healthy exercise life-style. To ensure across group generalizability; all presentations were performed by the author. Total presentation time was approximately one hour.

The exercise challenge was a three-week intervention designed to give students a choice of exercise. In total, there were four choices (cardio, flexibility, combination of both cardio & flexibility, no exercise) and students were able to choose one participation group that was appealing to them and one they believed that they could adhere to for the complete three week time period. Throughout this portion of the intervention, a weekly five-minute check-in occurred to encourage students, answer questions, and collect the weekly exercise charts. Lastly, all participants regardless of exercise group, were eligible for a reward at the end of the study. One student in each class was given a ten-dollar gift card to a local coffee shop.

Chapter Three

Results

The current study attempted to answer three hypotheses related to adolescent values, frequency of exercise, and amount of exercise. First, it was hypothesized that the intervention would significantly impact student's value of exercise as measured by the pre-assessments and post-assessments. Second, that student's frequency of exercise would increase following all levels of the intervention. Lastly, that student's amount of exercise would also increase following all levels of the intervention.

Demographics

A total of fifty-five students agreed to participate in the study (Class A = 22, Class B = 13, Class C = 18). Their ages ranged from fifteen to eighteen ($M = 16.11$, $SD = .63$). The majority of participants were in the tenth grade ($M = 10.19$, $SD = .48$). Of these students, 28 were male and 26 were female (one student did not respond). Using the race and ethnicity categories from the US census, the majority of participants reported their race as Caucasian (70.4%), followed by Other (9.3%), Asian (7.4%), Black (5.6%), Pacific Islander and Bi-racial (both 3.7%). There were no significant demographic differences between classes. However, there were differences between classes in their overall mean class percentage grade earned [$t(2) = 17.07$, $p < .01$]. With 100 being full class credit, Class A earned an mean percentage of 88, Class B 83, and Class C 72. Class

B had four outliers extracted while equating the mean due to poor attendance or participation.

Adjusting for the Missing Data

Many participants in Class C failed to respond to the frequency and amount of exercise questions for all three post-data collection periods. Missing data prevented the use of an ANOVA to analyze data from this class. So, a weighted mean for the group at each time was used to replace the missing data for each time interval. The subsequent analyses employ these weighted-mean replaced data. Additionally, there were four members of class C whose responses were not representative of the group. Therefore, their responses were extracted from the following calculations.

Test of the Hypotheses

Before analyzing intervention differences on exercise value, frequency and amount, it was important to first establish that the three classes were comparable prior to the intervention. Table 2 shows the mean pre-intervention values for value, frequency and amount of exercise for the three groups. A one-way ANOVA indicated that there were no significant differences among classes regarding exercise value [$F(2, 55) = 2.40, p = .10$] and exercise frequency [$F(2, 54) = 2.34, p = .11$]. There was a significant difference in exercise amount among the classes [$F(2, 53) = 4.86, p = .01$]. Post Hoc Tukey's analysis indicated that classes A and C were significantly different [$t(19.80) = -3.13, p < .01$]. However classes A and B [$t(13.25) = -1.92, p = .11$] and B and C [$t(29) = -.48, p = .82$] were not different.

Value of Exercise

The first hypothesis examined whether or not a biopsychosocially based exercise intervention would change an adolescent's value of exercise. The mean value of exercise rated by the three classes over the four times is shown in Tables 3 and 4. The assumptions of equality were not met [Mauchly's W test, $w(5) = .57, p = .001$], thus a Greenhouse-Geisser correction was employed. Results from repeated measures analysis of variance indicated that participating adolescents' value of exercise did not change significantly when data was collapsed for the three classes [$F(2.21, 85.98) = 0.23, p = .81$]. However, the interaction of class and time is a more accurate measure of the intervention and this interaction is significant [$F(4.41, 85.98) = 3.35, p < .01$]. This change in value of exercise is a medium effect ($\eta^2 = .14$). This indicates that students in different intervention groups responded differently over time.

Post hoc Tukey's analysis indicated that there were significant differences between classes in perceived value of exercise after post test 3. Specifically, results indicate that there were significant differences between classes B and C at the time of post test 2 [$t(23.80) = 2.85, p < .05$] and post test 3 [$t(17.78) = 2.44, p < .05$].

Frequency of Exercise

Students' frequency of exercise was hypothesized to increase at all post assessment times of the study. The mean frequency of exercise rated by the three classes over the four times is shown in Table 5 and 6. Results were assessed using repeated-measures ANOVA. The assumptions of the test were met, [Mauchly's W test, $w(5) = .80, p = .052$]. Students' frequency of exercise changed significantly when data was collapsed for all three classes [$F(3, 150) = 7.97, p < .001$]. This change in the frequency

of exercise is a medium effect ($\eta^2 = .14$). Additionally, the interaction of class and time is significant [$F(6,150) = 2.15, p = .05$] which is a more accurate measure of the intervention.

Post hoc Tukey's analysis indicated that there were no significant differences between classes in frequency.

Amount of Exercise

Student's amount of exercise was hypothesized to increase at all post assessment times of the study. The mean amount of exercise rated by the three classes over the four times is show in Table 7 and 8. Given that there were significant differences in class prior to any intervention, an analysis of covariance for the pretest score was utilized.

Assumptions of the test were met [Mauchley's W test, $w(2) = .918, p = .22$]. Results from a repeated measures analysis of variance indicated that students' amount of exercise did not change significantly when data was collapsed for the three classes [$F(2, 72) = .61, p < .55$]. However, the interaction of class and time is a more accurate measure of the intervention and this interaction is significant [$F(4,72) = 2.88, p < .03$]. This change in the amount of exercise is a medium effect ($\eta^2 = .14$).

Post hoc Tukey's analysis indicated that there were significant differences between classes in amount. Specifically, there were significant differences between classes at post assessment 2; A and B [$t(8.48) = -2.34, p < .01$] and B and C [$t(8.92) = 1.96, p < .01$]

Additional Findings

There were additional findings suggesting significant differences in frequency of exercise as a function of gender [$F(3, 48) = 5.65, p = .002$] such that males exercised often. These

statistically significant differences support existing literature regarding adolescent males tendency to exercise on a more frequent basis than females.

Table 2

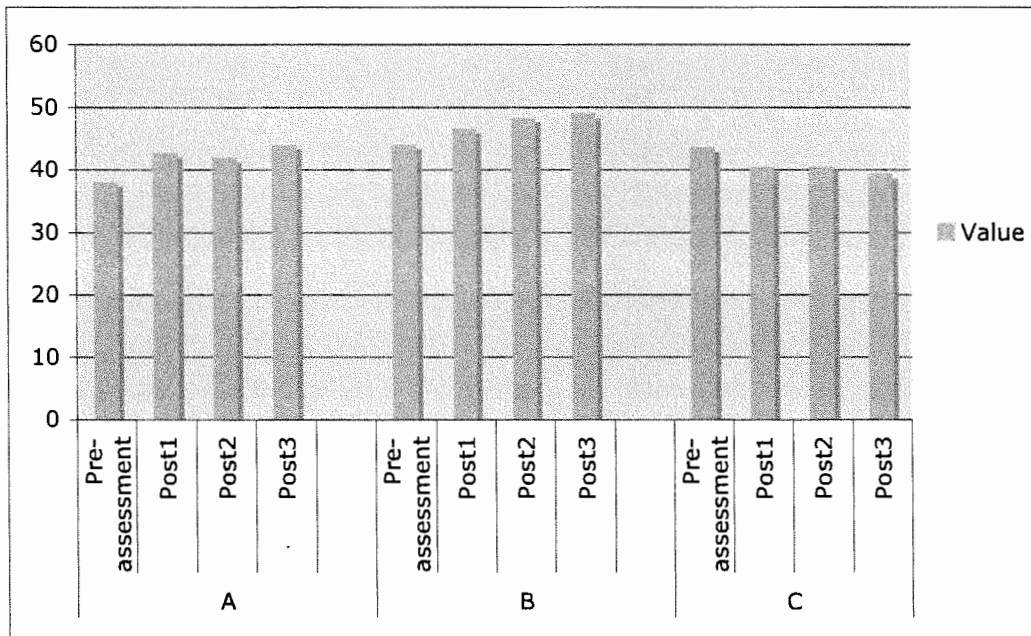
Mean Pre-Assessment Value, Frequency, and Amount

Group	Value		Frequency		Amount	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Class A	37.94	7.85	2.73	1.78	35.31	25.66
Class B	43.88	9.70	3.21	2.20	70.00	70.14
Class C	43.50	10.33	4.06	1.92	109.17	87.15

Note. *M* = Mean; *SD* = Standard Deviation. Mean *value* is the mean of pre-assessment totals, *frequency* is the mean number of days per week students reported exercise, and mean *amount* is the mean amount of minutes reported per exercise behavior per a week.

Table 3

Mean Adolescent Value of Exercise



Note. Value is measured by the mean of pre and post assessment totals.

Table 4

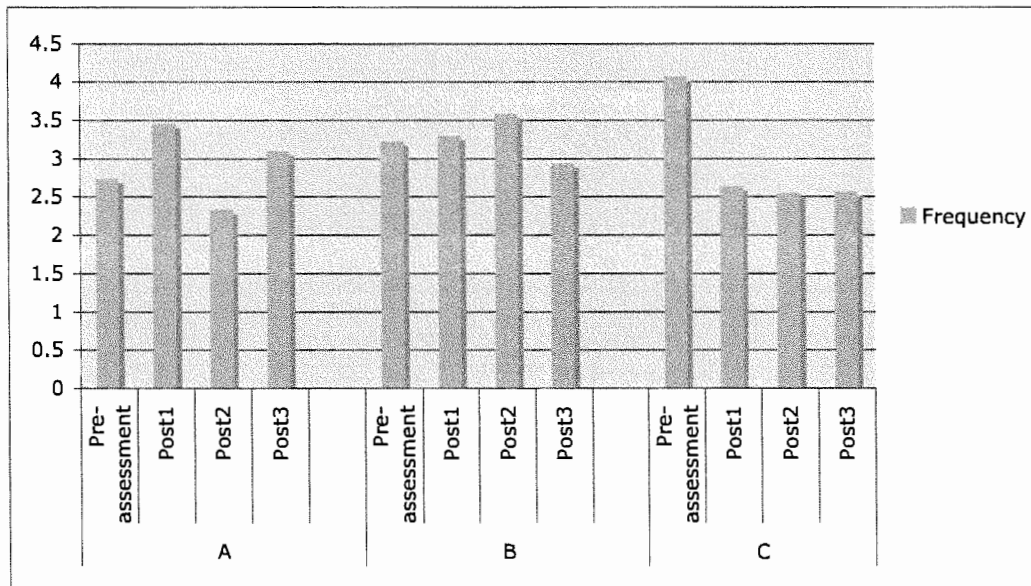
Mean Adolescent Value of Exercise

Class	Time	<i>M</i>	<i>SD</i>
A	Pre-assessment	37.94	7.85
	Post1	42.53	7.53
	Post2	41.82	7.70
	Post3	43.88	9.40
B	Pre-assessment	43.88	9.70
	Post1	46.50	5.83
	Post2	48.25	7.21
	Post3	48.88	9.11
C	Pre-assessment	43.50	10.33
	Post1	40.37	8.89
	Post2	40.40	8.06
	Post3	39.24	9.53

Note. *M* = Mean value of pre and post assessment totals. *SD* = Standard Deviation.

Table 5

Mean Adolescent Frequency of Exercise



Note. Frequency is number of days per week students reported exercise.

Table 6

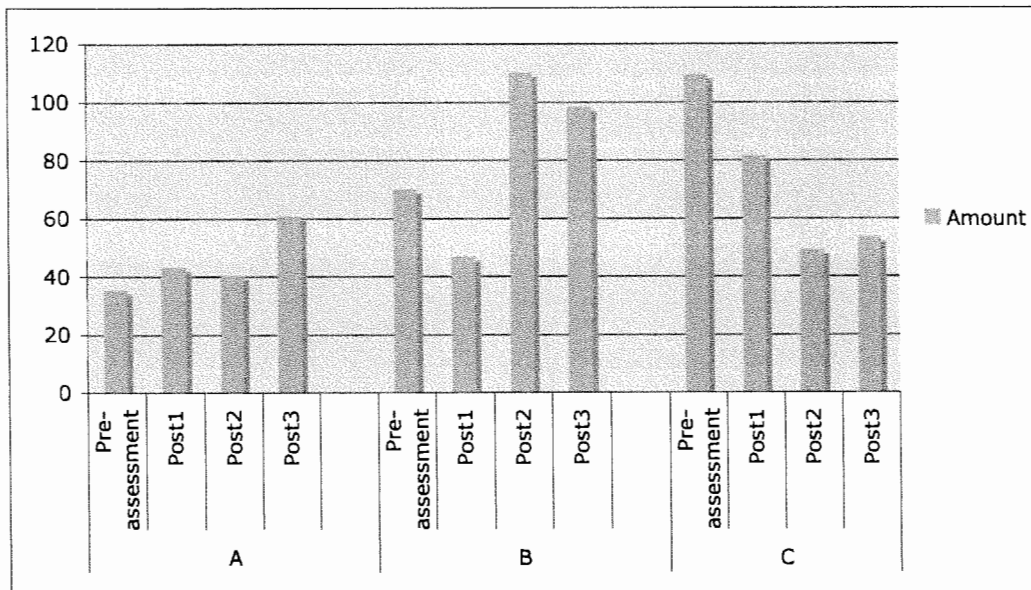
Mean Adolescent Frequency of Exercise

Class	Time	Mean	Standard Deviation
A	Pre-assessment	2.73	1.78
	Post1	3.45	1.26
	Post2	2.32	1.62
	Post3	3.09	1.95
B	Pre-assessment	3.21	2.19
	Post1	3.29	2.64
	Post2	3.57	2.44
	Post3	2.93	2.06
C	Pre-assessment	4.06	1.92
	Post1	2.63	1.46
	Post2	2.54	1.25
	Post3	2.56	1.25

Note. *M* = Mean number of days per week students reported exercise; *SD* = Standard Deviation.

Table 7

Mean Adolescent Amount of Exercise



Note. Amount measured in minutes reported per exercise per a week.

Table 8: *Mean Adolescent Amount of Exercise*

Class	Time	<i>M</i>	<i>SD</i>
A	Pre-assessment	35.31	25.66
	Post1	43.13	39.15
	Post2	40.31	20.69
	Post3	60.62	52.18
B	Pre-assessment	70.00	70.14
	Post1	46.67	40.83
	Post2	110.00	100.00
	Post3	98.33	92.61
C	Pre-assessment	109.17	87.15
	Post1	81.46	87.34
	Post2	48.98	28.83
	Post3	53.30	54.99

Note. *M* = Mean amount of minutes reported per exercise per a week. *SD* = Standard Deviation.

Chapter Four

Discussion

Discussion of Results

The goal of this study was to examine whether a biopsychosocially based intervention would impact an adolescents' value, frequency, and amount of exercise. Hypothesis 1, 2, and 3 were all supported by the results, which showed significant differences between classes after receiving the intervention. These results are consistent with the research related to effective strategies for adolescent exercise adherence (Anshel, 2006; Neumark-Sztainer, 2003). As hypothesized, this study indicates that students' value, frequency and amount of exercise increased after both a psycho-educational presentation and three-week exercise challenge.

Group Differences

Results additionally indicate that class B, which received the intervention in phases, was the most significantly impacted. Specifically, post hoc analyses indicated that Class B, was the most significantly different from the other classes at both post test 2 and 3 for value and amount of exercise. One reason this might be the case is that students were given three weeks after the psycho-educational presentation to process the information received and think about their personal ambiguity towards exercise. This processing time, likely helped students to feel more in control of their choice, and likely

facilitated more intrinsic motivation for change. Additionally, the intervention administered in phases slightly increased the number of interactions with the presenter and also served as a reminder of the benefits of exercise.

Not surprisingly, aside from class C, results also indicate that value, frequency, and amount of exercise tended to increase for the duration of the projects regardless of intervention level. However, students' scores for all three categories slightly decreased upon completion. There could be several reasons for this phenomenon, however, the most likely being students' response to a more self-motivated and less structured exercise lifestyle.

Interestingly, group C's responses were generally opposite from the initial proposed hypotheses. There are many variables that can have impacted their response pattern. First, this class was behaviorally different than the other two as observed by the researcher and the teacher. Students tended to speak impulsively and needed redirection throughout the presentation. Second, this class's overall average grade was significantly different (lower) than the other two classes (see demographic section). Students' lower grades are likely the product of poor participation, attendance, and/or school performance. The contrast in class population was evident in the students' poor observed participation during the psycho-educational component of the intervention and in the missing post-assessment responses.

Although not initially hypothesized, there was a significant difference in frequency of exercise related to gender. This correlates with the research stating that boys engage in more "intense" physical activity than girls, especially when in the presence of

their peers (Salvy et al., 2008). Given that this intervention was designed to encourage students to exercise with friends, these results are consistent with the existing literature.

Values and Behaviors

Results also support existing literature correlating one's perceived values with one's behaviors (Anshel, 2006). Specifically, when students' value of exercise increased, so did their exercise behaviors. Clinically, this indicates that while encouraging exercise behaviors, it is important to concurrently help individuals assess their personal values of exercise. This helps to build insight into why exercise is important or valued which can be used for motivation during the sometimes-difficult habit formation phase.

Motivational Interviewing

Given that this intervention was loosely based on the principles of Motivational Interviewing, it is important to address the intervention's success in light of this framework. The success of this sixty minute intervention suggests a minimal amount of time needed to have a significant impact on students' value, frequency, and amount of exercise. The theory behind Motivational Interviewing posits that because students argued for their own personal change (increase in exercise), they were more likely to adhere to the change for longer periods of time. Moreover, because they were encouraged in their ability, need, and commitment to adherence, they were more likely ready for change to occur.

Clinical Application

It is well-known that over the last several decades, American adolescents have become increasingly overweight. Just as there have been many contributors to this growing epidemic, research has shown that there are also many things that can help.

Integration of these values is key for inactive adolescents. This research proves that an intervention that encourages adolescents towards change and facilitates exercise choice with peer support is successful. Moreover, that when students are encouraged to verbalize the benefits of exercise and then practice it in a supportive environment, they are more likely to perceive associated value.

Implications

Implications suggest that this intervention could likely be useful in future health/exercise programs targeted for the adolescent population at minimal cost. Given that this age group is required to attend school, it would likely be beneficial to implement it within the public education system. This would additionally provide a pre-existing peer support network for the majority of students. In addition to the adolescent population, similarly structured interventions could also be applied to broader age populations.

Limitations

The accuracy in class C's self-reported data fell into question due to its significant difference from the other two classes. Although frequently used in research, self-report data is typically not the most accurate way to obtain data.

Class A was administered the second post assessment after the intended date due to the teacher's oversight. The expectation for the class to recall events surrounding the week may have influenced their reporting.

Future Research

The results of this study indicate an increase in value, frequency, and amount of exercise based on the intervention. However, there was no follow-up to assess for long-term change. Further research should determine whether participant's increase in value,

amount, and frequency remains consistent longitudinally. In addition, it would be interesting to assess participant's change in the psychological aspects of exercise pre and post intervention. Lastly, researchers may want to implement this intervention with different age groups for generalizability.

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Appendix A
Informed Consent/Assent

Informed Consent
Parent Form

Your son/daughter has the exciting opportunity to participate in a class project in Mr. Centoni's Health class. Kameron Dill, M.A. will be presenting the project and is a graduate student at George Fox University; she is obtaining her doctorate in psychology. This project will be under the supervision of Mary Peterson, Ph.D.

The project being proposed is exercised based and intended to assess whether or not a presentation centered about the benefits of exercise will affect an adolescent's value of exercise and actual exercise habits. Students' will be asked to listen to a 45minute presentation, participate in a three-week exercise intervention, and fill out a pre/post questionnaire. These questionnaires will assess the student's value of exercise as well as their current amount of exercise. This study will last from three to six weeks.

Your son/daughter is free to choose to participate in this project or decline. Students' are also free to stop the project whenever they choose. Students' will obtain the same amount of class credit (5%) regardless of their choice of participation. Additionally, students' names will not be used in the research and will be changed to an identification number.

Possible risks of this project are minor; including slight discomfort upon starting a new exercise regimen. Additionally, in order to protect your child, they are asked to stop exercising and refer to Mr. Centoni if they feel any discomfort during exercise.

Please feel free to ask Mr. Centoni or Mrs. Dill (Kdill04@georgefox.edu) any questions you might have before participation in the study. Please sign below if you agree that your child can participate in this study.

Parent Signature

Print Student Name

Date

Informed Assent
Student Form

My name is Kameron Dill and I am getting my doctorate in psychology at George Fox University. I am asking you to participate in this exciting project because you are in Mr. Centoni's health class.

In this study, I am trying to learn more about teenagers and exercise. In order to do this, I will ask you some questions, teach you about the benefits of exercise, and eventually challenge you to begin or increase the amount of exercise you do every week.

You are free to choose to participate in this project as well as free to choose not to. You can also choose to stop doing the project whenever you would like. Although your name is requested, no names will be used or shared in the report of this project.

There are not many risks to this project, but some might include slight discomfort when you begin the new exercise project. Additionally, it is important you stop exercising and refer to Mr. Centoni if you feel any discomfort during exercise.

Please feel free to ask Mr. Centoni or myself (Kameron)(kdill04@georgefox.edu) any questions you might have during the project. If you agree to be part of my study, please sign your name below. I will give you a copy of this form after you have signed it.

Signature of Participant _____

Date _____

Name of Participant _____

Signature of Researcher _____

Date _____

Appendix B

Intervention Measurements

Exerciser Checklist

Adapted from: *Applied Exercise Psychology* by Mark Anshel

Name: _____

1	2	3	4	5
Not at all like me		Somewhat like me		Very much like me

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1. I think about exercising with enthusiasm
2. I look forward to my next exercise session
3. I do not make excuses for avoiding exercise.
4. I view exercising as a challenge, not a chore.
5. I feel healthier and happier for exercising.
6. I am happy to receive feedback from others on
my exercise technique
7. I am confident in my ability to exercise
8. My family/Friends/partner support my exercise habit.
9. I drink plenty of water during the day.
10. I schedule my exercise sessions I know the days and times of the day I will exercise
11. I know the physical and psychological benefits of regular exercise.
12. I usually enjoy the company of others when I exercise.

13. Resting Heart Rate: _____
14. Currently, I exercise _____ times a week for at least _____ minutes.

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

Commitment to healthy lifestyle

Name: _____

1) My goal for this project is:

2) I choose to exercise _____ times a week on (circle days, and indicate time of day):

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time	Time	Time	Time	Time	Time	Time:

3) The exercise I choose is: _____

- 1 Cardio (Give examples)
 - 1Run/Jog
 - 2Basketball (talk about self-competition)
 - 3Option ran by Mrs. Ibarra or Kam
- 2 Flexibility(Give out packets)
 - 1Hackie sac
 - 2Skateboarding
 - 3Yoga/stretch
- 3 Both Cardio & Flexibility
 - 1Do Cardio for 20 min.
 - 2Stretch/yoga 10 min.
- 4 No exercise intervention

Outline for presentation:

Introduction

- I'm _____ and in grad school at _____. I'm getting my doctorate in psychology.

- What do you do to feel good about yourself? List on board: Eat, exercise, watch tv, work hard in school, spend time with friends/family....
- Provide a list on the board and have them rank what they feel makes them feel good about themselves.
- That was great class, and today we are going to focus on one those; specifically exercise!

Q: How many of you want to be healthy? Have kids raise their hands.

*It seems like many of you *think* that being healthy is important, during our time lets think about what you *think* makes you *do*?
(Draw on board think=do)

- At the end of today; my hope is that you will see new benefits to improving your physical health and how that benefits your self esteem/confidence too!
- Movie Clip of overweight character (What's eating Gilbert Grape?):
- What contributes to becoming overweight?

Have kids list different things that contribute and write on board

- 1 Eating habits
- 2 Exercise
- 3 Depression
- 4 Income
- 5 Peers
- 6 Extra curricular activities
- 7 Culture

- Why do we exercise?
 - 1 Physique self-esteem
 - 2 Weight control
 - 3 Affiliation/ social benefits
 4. Better mood, feel better (Story of depression & exercise)
- Long term consequences
 - 1 Weigh gain
 - 2 Increase stress/anxiety
- If we know and think all of this about exercise....Why don't we do it?

Q: Is not exercising acceptable?
Are you okay with the consequences of not exercising? BE HONEST!
If you are not okay with the consequences now is the time to take action!!

lass Project

- After all of this information and knowing that we don't accept being unhealthy, what do we do?
- Let's do a **3 week** project to see how exercise affects our self-esteem and confidence!!
 - You will have 4 choices of exercise (**Have overhead of this**)
 - 1 Cardio (list examples, specific options)

- 1 Run/Jog
- 2 Basketball (talk about self-competition)
- 3 Option ran by Mrs. Ibarra or Kam

2 Stretch/yoga (give out packets)

- 1 Hackie sac
- 2 Skateboarding

3 Both Cardio & Stretch/yoga

- 1 Do Cardio for 20 min.
- 2 Stretch/yoga 10 min.

4 No exercise intervention

- Now pass out worksheets to kids to have them decide days and times that they will work out
 - Have kids sign up for their exercise on chart
- 1 Goal: Work out 2 to 5 times a week for *at least* 20 minutes.
 - 2 Drink plenty of water
 - 3 Set up exercise groups with friends!
 - 4 Set attainable goals
 - 5 Challenge kids to replace screen-time with exercise.
 - 6 Have fun because you are building a happier you!

Weekly Exercise Chart

Week 1

Name: _____

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	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Exercise							
Minutes Exercised							