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ABSTRACT

The people of the United States of America have been concerned with the population's overweight and obesity rate for a while. The purpose of this study was to find out if optimism bias had an influence on fitness. Optimism bias is overestimating the likelihood of positive events and underestimate the likelihood of negative events happening in one's life. This study created a fitness optimism scale and used a set of fitness assessments and exercise questions to correlate with the fitness optimism bias. There were 105 students who participated in this study, 82 females and 23 males with a mean age of 20. The results of the study showed no significant relationship between optimism bias and fitness. Surprisingly, trends showed that with more exercise fitness optimism bias would increase.

Optimism Bias in Fitness

A Thesis

Presented to

The Faculty of the Graduate School

Abilene Christian University

In Partial Fulfillment

Of the Requirement for the Degree of

Master of Science

Clinical Psychology

By

Katrielle Angela Marx

May 2016

I dedicate my thesis to my loving parents, Michael and Joy Marx, both of you have been an inspiration in my life. I don't think I would have ever gotten on the topic of optimism had I not seen it work in both of your lives. Thank you so much for supporting me on this journey, this would not have been possible without your help.

Para sa aking Ina, Bienvenida Rehfeld, thank you for loving me. Neither of us would have believed that I would end up where I am today. We have been through a lot of hardships in our lives and because of it, the struggles have been a motivator for me to succeed. Thank you for cheering me on. Hintayin mo ako Ma. Ang lahat ng ginawa ay para sa ating kinabukasan. Mahal kita Mama.

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CHAPTER I

INTRODUCTION TO LITERATURE

Optimism

Optimism Defined

Optimism is commonly described as a positive outlook in life (Scheier & Carver, 1985). It is a perspective that is comprised of a cognitive, emotional, and motivational stance toward the future (Park, 2004). Optimism has been considered a cognitive construct that is related to motivation and self-regulation (Carver, Scheier & Segerstrom, 2010). Optimism has also been related to hope (Snyder et. al., 1991) and self-efficacy (Bandura, 1997). Optimistic persons believe that there is a brighter future and expect positive outcomes to occur. This leads many to confuse optimism with hope. Though they share similar concepts, optimism has been defined as a positive generalized outcome of expectancies (Scheier & Carver 1992). Hope, by contrast, is concerned with self-initiated actions one can take to create a successful future for oneself (Arnau, Rosen, Finch, Rhudy & Fortunato, 2007; Gallagher & Lopez, 2009). Hope is more concerned with self-initiated actions, whereas optimism sees luck and the actions of others and the self as leading to positive outcomes.

Researchers have distinguished between different types of optimism.

Dispositional optimism is the global expectation that more good or desirable things will occur than bad or undesirable ones (Carver et al., 2010). Situational optimism is a narrow expectation that good outcomes will occur in a certain context (Beazley, 2008). A person

who is not normally optimistic may choose to be optimistic during a certain situation. For example, a woman who recently found out she has breast cancer may choose to be optimistic about her prognosis.

Optimism is a style of reasoning that can be described by attribution theory (Seligman, 1991). Attribution theory involves how people attribute their successes and failures to various events, situations and people (Seligman, 1991). Attribution theory is comprised of three dimensions: locus of control, stability and controllability (Weiner, 1974). The locus of control refers to a person's perception of whether or not control is located internally or externally. Stability is concerned with change over time, or lack thereof. Controllability compares causes that one can control and those one cannot control (Weiner, 1974). For example, students with high self-esteem and high school achievement tend to attribute their failures to unstable and controllable factors such as effort. By contrast, students with low self-esteem and low school achievement attribute failures to stable and uncontrollable factors such as ability (Weiner, 1980). Overall, attribution theory suggests that optimism treats failures as unstable and views situations as changeable whereas a more pessimistic stance involves attributions of stability (Seligman, 1991).

Optimism is also viewed strategically. This occurs especially in performance-based situations. People who are optimistic have higher expectations, are more motivated, and expect positive outcomes (Ruthig, Chipperfield, Perry, Newall, & Swift, 2007). For example, consider a performer auditioning for a part on Broadway. If the performer chooses to think optimistically about his performance, this aids towards the motivation to work on auditioning well.

The Correlates of Optimism

Optimism and motivation. Many studies have observed relationships between optimism and the general well-being of a person. Among students, for example, it has been observed that students with optimistic outlooks have better motivational and adjustment skills, a lower chance of dropping out of college, and higher grade point averages (Solberg Nes, Evans, & Segerstrom, 2009). Optimistic persons are not any more skilled or talented than those who are less optimistic, but they tend to show more persistence in their efforts over time (Carver & Scheier, 2014). When it comes to prioritizing, optimism increases goal engagement for higher-priority goals and reduces engagement with lower-priority goals (Geers, Wellman & Lassiter, 2009). Optimists have also been shown to invest their self-regulatory resources in circumstances that are more favorable and decrease them in unfavorable circumstances (Pavlova & Silberreisen, 2013). Overall it appears that people who are optimistic are more self-motivated and focused (Carver, & Scheier, 2014).

Optimism and mental health. People with optimism appear to fare better emotionally and psychologically than pessimists (Carver & Scheier, 1990). For example, suicidal ideation is less likely to emerge in people with higher optimism (Rasmussen & Wingate, 2011). Patients who are more optimistic are also more likely to produce mental images of positive events, and thus are more likely to be successful with therapy or recovery (Blackwell et al., 2013). Optimism is also associated with better emotional responses in the face of adversity. The coping skills people with optimism display have been observed to lower physiological stress over time (Wrosch, Scheier, & Miller, 2013).

Optimism in relationships. In romantic relationships and friendships, optimism has been associated with a variety of positive outcomes. Interviews with newlyweds have shown that optimistic people are more likely to engage in constructive problem solving (Neff & Geers, 2013). Optimistic people are more successful in handling relationship or workplace crisis (Andersson, 2012b). People who are more optimistic hold a positive illusion about the available support they have, an illusion that appears to act as a buffer to stress (Vollmann, Antoniow, Hartung, & Renner, 2011). The size of a person's social network such as the diversity and the quantity has been found to be related to optimism (Andersson, 2012a). Finally, optimistic persons tend to surround themselves with people and develop a greater resilience to loneliness later in life (Rius-Ottenheim et al., 2012).

Optimism in health. Of interest to the proposed study, some of the more interesting findings related to optimism are in the area of health. For example, the Women's Health Initiative observed that people with a more optimistic outlook were less likely to develop and die of coronary heart disease (Tindle et al., 2009). Other studies have shown that optimism is linked to lower levels of two markers of inflammation (Roy et al., 2010), higher antioxidant levels (Boehm, Williams, Rimm, Ryff, & Kubzansky, 2013a), better lipid profiles (Boehm, Williams, Rimm, Ryff, & Kubzansky, 2013b) and lower cortisol responses (Jobin, Wrosch, & Scheier, 2013).

Optimism Bias

Optimism Bias Defined

Optimism bias is a cognitive illusion in which people overestimate the likelihood of the occurrence of positive events in their lives and underestimate the likelihood of experiencing bad events (Sharot, 2012). For example, people tend to overestimate their

career prospects or marriage success and underestimate their chances of suffering from cancer or being in a car accident (Sharot, 2012). In the early research on optimism bias, Weinstein (1980) noted that people are unrealistically optimistic because they focus on factors that improve their own chances of achieving desirable outcomes and fail to realize that others may have just as many factors in their favor. About 80% of the UK population has displayed evidence of the optimism bias (Sharot, 2012). The optimism bias has been found in every race, region, culture, and socioeconomic category (Sharot, 2012). For example, both European American and Japanese samples have been observed to expect more positive events to occur for themselves than for others (Chang, Sanna & Asakawa, 2001). In a follow up study, both European Americans and Asian Americans displayed an optimism bias towards their health (Chang, Sanna, Kim, & Srivastava, 2010).

The Correlates of Optimism Bias

Optimism bias and mental health. Optimism bias has been examined among depressed populations. Specifically, people with mild depression show no biases, and people with major depression tend to expect things to turn out worse than they do (Strunk, Lopez, & DeRubeis, 2006). This has been called the pessimism bias (Strunk et al., 2006). Further studies have shown that the optimism bias helps guard against depression (Taylor & Brown, 1988). Some studies suggest that the optimism bias is related to optimism because it serves an important function in people's interpretation of current situations and previous experiences in a positive future-oriented way that may contribute to positive mental health and well-being (Sharot, Riccardi, Raio, & Phelps, 2007; Taylor & Brown, 1988).

Optimism bias and physical health. Overall, then, it appears that optimism and optimism bias are associated with positive emotional and psychological well-being. However, the picture changes when one begins to consider physical health and well-being. In contrast to much of the research just cited, most research regarding optimism bias and physical health suggests that optimism bias affects people negatively (Murray, 2011). While optimism bias can produce specific plans of action for dealing with risk (Armor & Taylor, 1998) and increase behaviors which are beneficial for one's health (Taylor et al., 1992), most of the evidence suggests that optimism bias is more likely to have a negative impact on health (Murray, 2011).

For example, individuals underestimate their vulnerability to a wide range of health conditions, including cancer, cardiac disease, substance abuse, and HIV (Helweg-Larsen & Shepperd, 2001; Katapodi, Dodd, Lee, & Facione, 2009; Klein & Weinstein, 1997; Weinstein & Klein, 1995). Optimism bias is also associated with greater risk of health-related factors like high cholesterol (Radcliffe & Klein, 2002). It has been observed that people underestimate their chances of suffering from a disease (Taylor & Brown, 1988).

Studies have shown that optimism bias is strong in situations that are considered preventable or controllable, unknown, unusual, and embarrassing (Korkeila et al, 2001; Whalen et al, 1994; Weinstein, 1987). This could impact how people estimate the likelihood of being affected by certain diseases. For example, university students have shown an optimism bias toward contracting diseases like AIDS (Eiser, 1993).

A recent study suggests that optimism bias is robust in the face of contradictory evidence and is a non-fluid response (Sharot, Korn, & Dolan, 2011). In the study,

participants who over-estimated their chances of suffering from cancer were more likely to change their estimate downward when they were given correct baseline information. By contrast, participants who initially under-estimated their chance of suffering from cancer—participants who showed an optimism bias—were unlikely to modify their estimates upward when given correct baseline information. Overall, this suggests that people who have an optimism bias will continue to believe in the better outcome despite evidence to the contrary (Sharot et al., 2011).

A follow up to Sharot et al. (2011) indicates that optimism bias can be manipulated by interfering with the region in the brain called the inferior frontal gyrus (Sharot et al., 2012). The study suggests that people with optimism biases fail to generate learning signals when confronted with negative evidence about their belief (Sharot et al., 2012). Again, this suggests that the optimism bias can prove detrimental when a person makes decisions about his or her future well-being.

Overall, optimism and optimism bias have many positive effects, especially in the area of emotional and psychological well-being. However, in the area of physical well-being, the optimism bias appears to undermine preventative actions and self-care. The purpose of the proposed study is to examine the effects of optimism bias upon fitness, given that fitness is an important aspect of physical well-being and preventative self-care.

Health and Fitness in the United States of America

Health is defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (World Health Organization [WHO], 1946). Health in the U.S. has been a concern for many years and remains a pressing concern. For example, reports show that more than one third of the American adult

population is obese (U.S. Department of Health and Human Services [USDHHS], 2010). This translates to about 78.6 million Americans walking around with excess body fat. Obesity is particularly worrisome for the youth of this country. In the past three decades, the U.S. has experienced its highest number of obese youth (Center for Disease Control and Prevention [CDCP] & National Center of Health and Statistics [NCHS], 2013). Recent statistics show obesity in children doubling and quadrupling in adolescence since 2010 (CDCP & NCHS, 2015b). These statistics are of concern in that obesity is correlated with hypertension, hyperlipidemia, Type 2 diabetes, stroke, and some cancers (Kramer, Zinman, & Retnakaran, 2013; Ogden, Carroll, & Flegal, 2014; Pan et al., 2012).

Another factor of health concern in the U.S. is the amount and quality of food consumption. According to the USA Department of Agriculture (USDA, 2010), a typical American diet exceeds the recommended caloric intake levels and since the 1970s the number of fast food restaurants has more than doubled.

Food is one of the main contributors to USA's overweight and obese population, but lack of exercise is another (National Health, Lung and Blood Institute, 2012). In the literature, physical activity and exercise are usually confused. Physical activity refers to skeletal muscle activity and energy expenditure (CDCP & NCHS, 2015a). Exercise, on the other hand, encompasses structured, repetitive activity performed with the intent to improve one's health (Caspersen, Powell, & Christenson, 1985).

A related concept is fitness. Generally, fitness is a set of attributes comprised of cardiovascular endurance, muscular strength, muscular endurance, body composition, and flexibility for the means of increasing one's energy reserve or the reliance on the body to perform what it needs to do (USDHHS, CDCP, & Health Promotion, 1996). Research has

shown a variety of benefits when engaging in exercise to achieve optimum fitness levels (Office of Disease Prevention and Health Promotion [ODPHP], 2016). Fitness helps control weight, fights against health conditions and diseases, improves mood, boosts energy, promotes better sleep, helps brain functionality, relieves stress, and positively affects sexual activity (Armstrong & Oomen-Early, 2009; CDCP, 2013; USDHHS, 2008).

However, only one out of three children are active everyday (NASPE, 1999), and fewer than 5% of adults participate in 30 minutes of physical activity each week (USDA, 2010). More than 80% of adults do not meet the guidelines for both aerobic and muscle strengthening activities, and more than 80% of adolescents do not do enough aerobic physical activity to meet the guidelines for youth (Physical Activity Council [PAC], 2014).

Given the low rates of exercise in the U.S. population, the question presents itself: what prevents people from putting in the effort to start or maintain a physically active lifestyle? Some of the main reasons are time limitations, insecurities, low energy, laziness, failure to persist in reaching goals, money, or fear of injury (Ebben, 2008). To expand the understanding of the correlates of poor fitness and lack of exercise, the goal of the proposed study is to determine if low rates of exercise and poor fitness can be attributed to optimism bias, people believing themselves to be more fit than they actually are.

The Current Study: Optimism Bias in Fitness

In relation to physical health, optimism bias has mainly been associated with susceptibility to disease (Murray, 2011). There has been no research done concerning the

relationship between optimism bias and fitness. However, it seems reasonable to expect that if people are optimistically biased towards their fitness level, this bias could be a factor in why people are less likely to exercise.

It was hypothesized that optimism bias can affect fitness in two related ways. First, people might assume themselves fitter than they actually are. This optimism bias would presumably undermine motivation to exercise. Second, people might underestimate their susceptibility to physical states associated with poor fitness. Such states would include vulnerability to injury, loss of muscle tone, and weight gain. Again, people who underestimate their susceptibility to these fitness-related outcomes would be less motivated to engage in a regular physical fitness regimen to prevent their occurrences.

The goal of the current study was to assess optimism bias in relation to fitness-related physical states and compare that bias to physical fitness and body mass index. Towards that end, a measure of fitness-related optimism bias was constructed. This instrument was used to assess the bias in a sample of undergraduate students enrolled in a physical education class at Abilene Christian University and correlated with the measures of fitness assessed within these classes. Self-reported fitness and exercise activity was also collected from the students.

Overall, the study predicted that people with high optimism bias in the realm of fitness would be less engaged in exercise and fitness activity. In addition, it was predicted that participants showing a fitness-related optimism bias will be less fit compared to those without the bias.

CHAPTER II

METHOD

Participants and Procedure

Participants were drawn from a course called Lifetime and Wellness on the Abilene Christian University campus. These courses have a fitness assessment that is taken within 2 to 3 weeks of the beginning of the semester. Participants were asked to give their fitness results after having taken the survey assessing their optimism bias.

A total of 105 people were assessed (23 males and 82 females). Participants in each group were similar in age ($M = 20$, $SD = 1.9$). The classification breakdown was approximately 27% freshmen, 27% sophomores, 31% juniors, and 16% seniors. The subject pool was predominately 69% White followed by 15% Hispanic or Latino, 7% African-American, 4% Asian, 1% Native Hawaiian or Pacific Islander, and 3% other.

Of the total participants six of them were college athletes. When asked the question “Have you been exercising for the past three months” 75% answered yes and 25% answered no. The first follow up question was “ If so how many times in a week? Forty percent answered 3-4 times, 17% said 5-6 times, 17% said 1-2 times and 2% answered 7 times a week. The second follow-up question was “and for how long?” Twenty-nine percent said 30-45 min, 24% said 45 min to 1 hour, 16% said over an hour, and 7% said 15-30 min.

Measures

Fitness Assessments

These fitness assessments are a compilation of the assessments that were done in the wellness classes. These include cardiovascular assessment, muscle endurance and strength assessments, flexibility assessments, and body composition assessments. The cardiovascular assessment varied from class to class.

The cardiovascular assessments that were used are: 12-minute run test, 1 ½-mile run or walk test, and the 3-minute step test, or alternatively the Rockport test. The 3-minute step test involves a metronome and a 16-25 inch step. Participants are required to step up and down from the steps in accord to the metronome, with the number of steps completed being recorded. The Rockport test is used for individuals who have health issues that may otherwise prevent them from doing any of the three other cardiovascular assessments. This involves using a flat track or course that measures one mile. Participants are asked to walk and maintain their rate of exertion for one mile and record their pulse after completion.

Muscle endurance and strength were measured with the following assessments. Focusing on the abdominal muscles and hip flexors: a 1-min sit-up test and a 1-min curl-up (similar to a sit up as it targets the abdominal muscles but only raising your upper body 30-40 degrees above the floor.) Focusing on the upper body: untimed push-ups and modified push ups. A modified push is similar to a push-up but the knees touch the floor. In these untimed assessments, the total number of push-up is recorded. The final test is the Dynamometer, which assessed the strength in the hand and forearm. A Dynamometer is a spring-loaded squeeze device that measures force.

Flexibility was assessed with the shoulder flexibility test and the sit-and-reach test. The shoulder flexibility test measures the shoulder joints on both sides and involves the person reaching as far as they can to touch the palms of either hands behind their back. The distance between the two palms is recorded. The sit-and-reach test is assessed using sit-and-reach-boxes, which are boxes with a measuring tab in inches on top. Participants sit with their backs against the wall and straight legs. The box is placed against the bottom of their feet and the participant is asked to reach forward to move the tab forward, with the distance recorded as an assessment of flexibility in the lower back and hamstrings.

Body composition was assessed through bioelectrical impedance analysis, body mass index, waist circumference, and waist-to-hip ratio. The bioelectrical impedance analyzer is a scientific device to measure a person's percent of body fat. It does this by measuring the resistance of body tissues through the flow of a small harmless electrical signal (Dehghan & Merchant, 2008). Results were assessed electronically. The body mass index (BMI) is a number calculated from a person's weight over the person's height squared (CDCP, 2015). It is the most common technique for assessing body fat without any equipment (CDCP, 2015). The waist circumference and waist-to-hip ratio are suggested to measure for cardiovascular disease risk such as glucose tolerance, reduced insulin sensitivity, and lipids (fat) profiles which are risk factors for type two diabetes (WHO, 2008). Participants measured their waist circumference and waist-to-hip ratio with the use a measuring tape. To assess the waist-to-hip ratio, the hip measurement is divided by the waist measurement (WHO, 2008).

General Exercise Questionnaires

These questions were used to help assess the individual's current level of fitness-related activity. The questions were adapted from the client interview from *Fitness and Health Coaching* (2015). The questions were modified to fit the college setting and the study. The questions are as follows: "On a scale from 1-10 (1 = low; 10 = high), how would you rate your present fitness level?"; "Have you been exercising for the past three months? If so how many times a week? (1-2, 3-4, 5-6, 7)"; "How long is the duration of your exercise? (15-30 min, 30-45 min, 45 min - 1 hour, over an hour)"; -"Are you a student athlete at ACU? If so, what program?"

Fitness Optimism Bias Scale (FOBS)

This scale was developed for use in this study to assess optimism bias in fitness. The scale consists of 14 items. Participants were asked to rate each item on a Likert scale from 1 to 7 (1 = "definitely not"; 7 = "most definitely"). To assess congruency in optimism bias, both positive and negative situations were given, dividing the scale into two sections. The first section is comprised of positive fitness outcomes occurring within the next two months. Questions such as "Maintaining or losing weight" and "Maintaining or gaining flexibility" were asked. The second section consists of negative fitness outcomes occurring within the next two months. Questions such as "Getting a knee injury" or "Losing endurance" were asked. Negative outcome items were reverse scored before adding them to the positive outcome items to create a total optimism bias score. The entire scale can be found in Appendix A.

CHAPTER III

RESULTS

The goal of the study was to assess whether or not optimism bias had any correlation with fitness and exercise. To do this, a fitness optimism bias scale was produced and fitness assessments were gathered. It was predicted that optimism bias would be negatively correlated with fitness. It was also predicted that optimism bias would be negatively associated with exercise.

Fitness Optimism Bias for Positive and Negative Fitness Outcomes

Before hypothesis testing, correlations between the fitness optimism bias total, positive outcomes and negative outcomes were run. The goal of this analysis was to assess the relationship between negative and positive fitness-related outcomes. These correlations can be seen in Table 1.

Table 1

Optimism Bias for Positive and Negative Fitness Outcomes

Variables:	1.	2.
1. FOBS -Total		
2. FOBS - Positive	.75**	
3. FOBS - Negative	.86**	.34*

* $p < .01$ ** $p < .001$

As can be seen in Table 1, results showed that the correlation between positive and negative fitness outcomes was significant, but not strong. This suggests that

participants viewed positive and negative fitness outcomes differently, envisioning positive fitness outcomes but not negative ones (and vice versa). Consequently, in the analyses presented below, biases for negative and positive fitness outcomes are presented separately along with the fitness bias total score.

Fitness Optimism Bias and Fitness Results

The main objective of the study was to assess the relationship between fitness optimism bias and fitness measures as completed in the Lifetime and Wellness classes. Given the weak correlation observed in Table 1 between the positive and negative fitness optimism bias, these totals were used along with the overall total score to correlate with the fitness assessment results.

It was predicted that optimism bias would be negatively correlated with all the fitness measures. This would indicate that people who are optimistic about their fitness, or optimistic that they will not suffer any future negative effects related to fitness, would be the least likely to be fit, presumably because they would be less likely to exercise due to their optimism bias. In order to test that prediction, correlations were run between the fitness optimism bias totals and the fitness results from the wellness classes. The results can be found in Table 2.

Table 2

Fitness Optimism Bias and Fitness Assessment Results

Fitness Results:	FOBS		
	Positive	Negative	Total
12-min run	-.11	-.13	-.10
1 ½-mile run	-.15	-.06	-.11
3-min step	.06	.05	.09
Rockport walk	.08	-.07	.05
Shoulder flexibility	-.04	.16	.16
Sit-and-reach test	.15	-.10	.04
Sit-up test	.15	-.06	-.01
Curl-up test	.13	.09	.12
Push-up test	.03	.02	.07
Dynamometer	.31	.05	.23
Bioelectrical	-.03	-.41	-.13
BMI	.17	.09	.12
Waist-to-hip	-.07	-.20	-.20

As can be seen in Table 2, though there were some negative correlations, there were no significant associations observed between fitness optimism bias totals and fitness assessment results. Unexpectedly, some trends were positive, though non-significant. The reasons for these trends are explored in Chapter 4.

Fitness Optimism Bias and Exercise

Fitness differs from exercise. In addition to fitness, participants were also asked about their consistency with exercise over the past three months. Those who reported exercising consistently were also asked about their exercise frequency during the week. Similar to the prediction regarding fitness, fitness optimism bias was predicted to be highest among those who do not exercise regularly. That is, it was predicted that fitness optimism bias would undermine a desire to exercise regularly to prevent future negative fitness-related outcomes (or reap positive outcomes). In order to test this prediction, fitness optimism bias scores (overall total) were compared between those who reported exercising regularly over the last three months and those who did not.

Again, it was predicted that those who were not exercising regularly would report higher fitness optimism bias. To test that prediction, an independent sample *t*-test was conducted comparing mean fitness optimism bias between those who had said *yes* and those who had said *no* to the question “Have you been exercising regularly for the last three months?”- Those statistics can be found in Figure 1.

Overall, there was not a significant mean difference between the groups, *yes* ($M = 75.68$) and *no* ($M = 73.26$) for fitness optimism bias: $t(90) = .91, p > .05$. Interestingly and contrary to predictions, fitness optimism bias was higher among those who reported exercising regularly. Again, these finding will be discussed in Chapter 4.

Participants who were exercising regularly were also asked how frequently they exercised each week. Similar to the prediction mentioned above, it was predicted that fitness optimism bias would be lowest among those who were exercising less frequently throughout the week. To test this prediction an ANOVA test was conducted between

three groups: those reporting that they exercised 1-2 times, 3-4 times or 5-6 times a week. As can be seen in Figure 2, the groups did not vary much: 1-2 times ($M = 72.33$), 3-4 times ($M = 75.47$) and 5-6 times ($M = 79.64$). Overall, there was no significant difference for fitness optimism bias between the groups: $F(2,66) = 2.44, p = .09$.

In summary, no relationship was observed between fitness optimism bias and fitness. Neither was a relationship observed between fitness optimism bias and self-reported exercise.

Figure 1

Mean FOBS Scores for Question “Have you been exercising regularly for the last three months?”

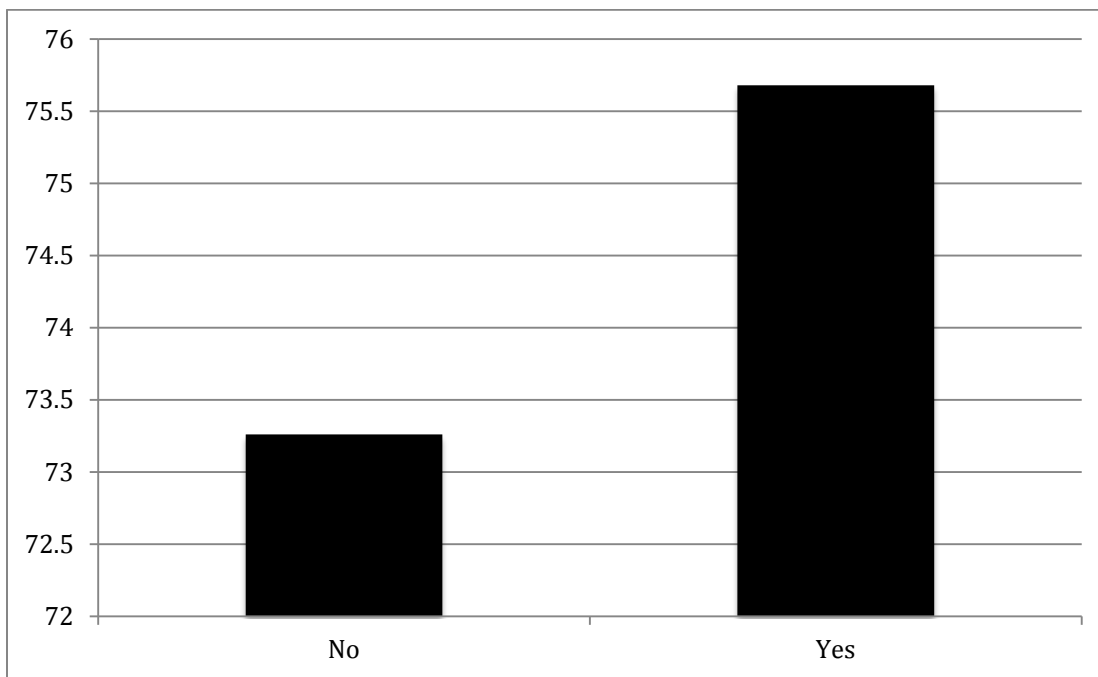
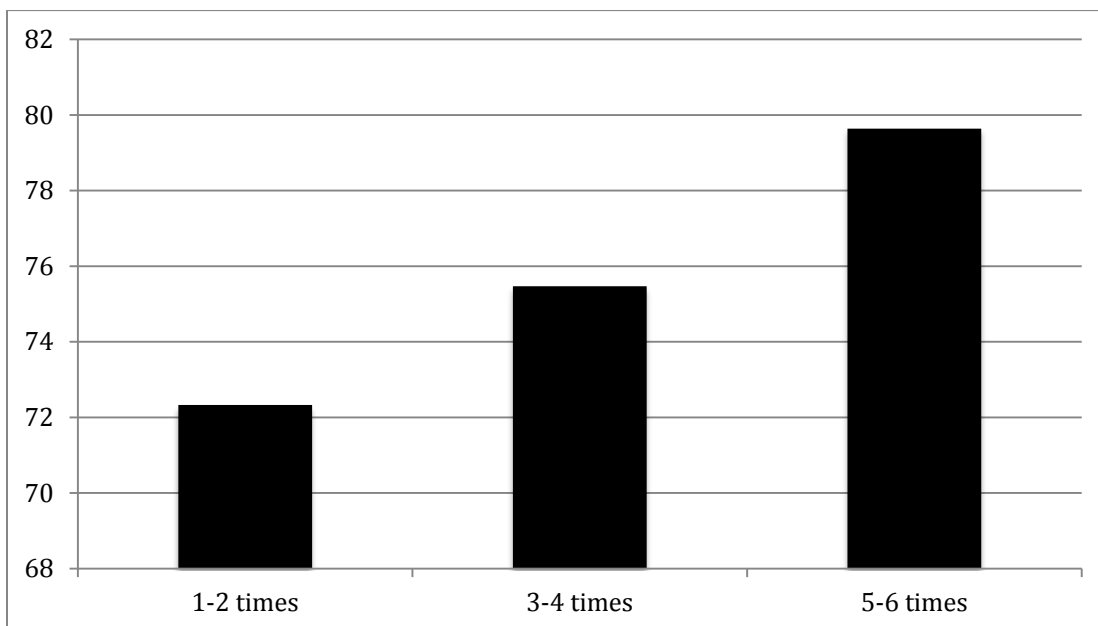


Figure 2

Mean FOBS Scores for Question “How many times a week do you exercise?”



CHAPTER IV

DISCUSSION

Summary and Overview of Results

The goal of this study was to determine whether or not optimism bias affected individuals fitness levels. As mentioned in the literature review, health in America has been of concern for many years. One third of the American adult population is considered obese (USDHHS, 2010) and the number of obese youth continues to grow (CDCP & NCHS, 2013). Obesity is a concern that is correlated with hypertension, hyperlipidemia, Type 2 diabetes, stroke, and some cancers (Kramer et al., 2013; Ogden et al., 2010; Pan et al., 2012).

Literature shows that optimism has been positively correlated in countering health problems such as heart disease (Tindle et al., 2009) and inflammation (Roy et al., 2010). It lowers cortisol (Jobin et al., 2013) as well as improves the profiles of lipid (Boehm et al., 2013b).

Related to optimism is optimism bias, the cognitive illusion in which people overestimate their likelihood of positive events occurring and underestimate the likelihood of suffering in their own lives (Sharot, 2012). Though optimism bias has been found to motivate people to take specific action when dealing with risk (Armor & Taylor, 1998), in the field of health optimism bias has been found to be correlated with susceptibility towards disease (Murray, 2011). Individuals underestimate their vulnerability to a wide range of health conditions, including cancer, cardiac disease,

substance abuse, and HIV (Helweg-Larsen & Shepperd, 2001; Katapodi et al., 2009; Klein & Weinstein, 1997; Weinstein & Klein, 1995). People tend to underestimate their chances of suffering from cancer (Sharot, 2012; Taylor & Brown, 1988). Optimism bias is also associated with greater risk of health-related factors like high cholesterol (Radcliffe & Klein, 2002), thus being harmful to one's physical well-being.

This paradox between health in optimism and health in optimism bias is one of interest and worth pursuing. Optimism bias, as a subcategory of optimism, seems to counteract optimism in the domain of health. Could this be a reason why individuals are motivated to start fitness programs and stop, or never start in the first place? Could optimism bias be preventing optimism from functioning positively in regards to fitness? To date, no research has been done on the effects of optimism bias upon fitness.

The goal of the study was to see if the relationship between optimism bias and fitness existed. Surprisingly, no measures of fitness optimism bias were found in the literature. Therefore one of the main goals of this study was to construct a fitness optimism bias measure. The measure was constructed by mirroring health optimism bias measures (see Methods).

Having created the fitness optimism bias measure the goal was to correlate that measure with fitness assessment results and exercise questionnaires. A total of 105 participants completed the fitness optimism bias scale, answered the exercise questionnaires and shared their results from a fitness assessment required by a college wellness class. The fitness assessment results were comprised of cardiovascular, muscle endurance, muscle strength, flexibility, and body composition assessments. Fitness optimism bias was also correlated with self-reported exercise. It was predicted that fitness

optimism bias would be negatively correlated with both fitness and exercise. The rationale for the prediction was that fitness optimism bias—overestimating positive fitness outcomes and underestimating negative fitness outcomes in the future—would undermine the motivation to exercise and improve fitness.

Overall, the results indicated that there were no significant associations between fitness optimism bias with fitness and exercise.

Why Was Optimism Bias Not Associated With Fitness and Exercise?

As noted, contrary to predictions no associations were observed between fitness optimism bias with fitness and exercise. Why might that have been the case? The following are some possible answers.

Fitness Concerns Among the Young

The study was taken from a sample of convenience from a university setting, which placed the sample around the age of 20. Due to the lack of experience towards any detrimental form of body aging, a younger generation may not have experienced drastic physical problems. This might have affected optimism bias, the ability to envision and predict future fitness outcomes. Populations of this age are likely to have a sense of invulnerability and therefore not worry about negative events happening to them. Fitness optimism bias may not have yet developed within these younger populations. Another thought to consider is that younger persons will recall fast recovery processes that followed any physical problems (Falk & Dotan, 2006). Overall, then, the need to attend to fitness may not have impressed itself sufficiently or fully upon the college-age sample used in this study.

Optimism Bias versus Reality

When being assessed participants may have run into trouble with the concept of a bias versus reality. It is plausible that the assessment of “bias” was functioning as a measure of current fitness. For example an item like “Maintaining or improving cardiovascular fitness” in the future might have been assessing bias, but it also might have been assessing a realistic view of one’s own fitness and current exercise regimen. Participants may have believed in positive outcomes because of their current actions towards prevention. For example, while not significant, the findings indicated that fitness optimism bias was higher among those who were exercising more (Figure 2).

In short, it is possible that people were not actually reporting optimism bias but the reality of their current situation. Participants may have believed they were going to avoid future injuries or physical problems because of their current behaviors. This leads to the question as to whether or not self-report is the best way to assess fitness optimism bias. This will be a subject in the limitations section.

Envisioning Future Fitness

It may be difficult to imagine fitness related outcomes compared to health-related outcomes. For example, it seems relatively straightforward to ask a participant: “What are the chances of you getting cancer within the next three months?” Compare that to a fitness related outcome: “What are the chances of you losing flexibility within the next three months.” Though loss of flexibility can lead to higher chance of injury in the future, it may be hard to envision or assign a probability to such fitness related outcomes. This may be due to a lack of education toward fitness and its benefits.

Consequently, the lack of fitness in America maybe implicated in this inability to contemplate the consequences of poor fitness. Cancer is clearly envisioned health consequence. But what about your risk for a torn anterior cruciate ligament (ACL)? Prevention of a torn ACL includes stretching and better running form, but not many people think of this until the problem arises. Fitness is something that can be proactively done to avoid negative problems, but it may be harder to envision the consequences of poor fitness. People are more likely to wait until something happens, such as an injury or a warning from a physician about an obesity issue.

Limitations of Current Study and Future Direction

The study was limited in a number of ways. First, the sample of convenience that was taken from a private Christian university had a mean age of 20. On average, metabolic rates are their highest before the age of 25 (Fukagawa, Bandini, & Young, 1990). After that age marker, metabolism gradually decreases and it becomes dependent on the individual to maintain metabolic rate (St-Onge & Gallagher, 2010). On top of the metabolic rate, health issues are not yet a major concern in the late teens and early 20s. Hence, no dire reason may have surfaced in a majority of the participants to value fitness as a lifestyle rather than a hobby. Another factor to consider is educational level. Participants are college students who are attempting to attain a bachelor's degree. Previous exposure to fitness and health through the university and other media may have been presented. Therefore, they may have started healthier habits to avoid negative outcomes. In addition, physical classes are required as part of the university's curriculum.

Secondly, significant results may not have been presented due to the fitness optimism bias instrument developed for this study. For example, the prompt used in the

scale “What are the chance of these events happening to you in comparison to others” may have been confusing. That prompt could have been easily lost as participants proceeded through the survey, causing them to focus less on future outcomes than upon their current fitness level. Steps were taken to emphasize the distinction with emphasis given within the survey and through verbal communication of the researcher. It is also possible that participants found it difficult to make fitness comparisons with their peers.

Third, the fitness assessments from the wellness classes did not assess fitness holistically and comprehensively. It would have been ideal for a holistic fitness variable to exist, but no consensus exists on what that should involve. Fitness is still considered a set of attributes with the purpose of increasing one’s energy reserve or the reliance on the body to perform what it needs to do (USDHHS, CDCP, & Health Promotion, 1996). Fitness is currently measured as a set of physical attributes that can’t be placed into a single overall score to determine fitness level. For example, weightlifters, who according to the BMI may score in the overweight category, would score above average in muscle strength. By contrast, someone can have a normal BMI score for their height but score poorly on muscle endurance.

Fitness and personal well-being are important issues when considering the future of a population. Consequently, more research is needed to explore the reasons as to why people lack motivation regarding their physical fitness. Some of this research should continue to examine the effects of optimism bias upon fitness by taking the limitations noted above into consideration.

Firstly, it would help to observe if optimism bias exists later on in life when the body starts to age. This study used late teens and young adults who most likely have not

experienced any fitness-related physical problems. Attaining a sample set of different ages (30s, 40s, and 50s+) may help to better target optimism bias in fitness. In addition, physical history was not assessed during this study. Fitness optimism bias, even among the young, may be different among those who have no current or past physical ailments.

Secondly, education can play a role in a participant's reaction and/or opinion towards fitness. In this study, participants were purposefully trying to attain a college degree and were enrolled in a wellness class, exposing them to health and fitness related information. People with less education may lack information about fitness and health and therefore be at a disadvantage in envisioning future health and fitness related outcomes.

Finally, self-report may not be the best way to assess and/or measure optimism bias in fitness. Improvements of the scale developed for this study should be looked at in future research.

Conclusion

The current study found that there was no correlation between optimism bias and fitness. However, this area of research is new and demands more attention. More research needs to be done on the relationship between optimism bias and fitness along with the development of better assessment instruments.

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APPENDIX A
IRB APPROVAL LETTER

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World
Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885



February 1, 2016

Ms. Katrielle Marx
Department of Psychology
ACU Box 28011
Abilene Christian University

Dear Ms. Marx

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled *Optimism Bias and Fitness*

was approved by expedited review (46.110(b)(1) category 7) on 1/29/2016 for a period of one year (IRB # 15-112). The expiration date for this study is 1/29/2017 . If you intend to continue the study beyond this date, please submit the Continuing Review Form at least 30 days, but no more than 45 days, prior to the expiration date. Upon completion of this study, please submit the Inactivation Request Form within 30 days of study completion.

If you wish to make any changes to this study, including but not limited to changes in study personnel, number of participants recruited, changes to the consent form or process, and/or changes in overall methodology, please complete the Study Amendment Request Form.

If any problems develop with the study, including any unanticipated events that may change the risk profile of your study or if there were any unapproved changes in your protocol, please inform the Office of Research and Sponsored Programs and the IRB promptly using the Unanticipated Events/Noncompliance Form.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs

APPENDIX B

FITNESS BIAS SCALE

On a scale from 1 to 7, 1 being *definitely not* and 7 being *most definitely*

What is the likelihood of these events happening to you as compared to others like you?

Positive future outcomes: in the next 2 months

Maintaining or gaining agility

Increased coordination

Maintaining or losing weight

Maintaining or gaining better balance

Maintaining or gaining physical strength

Maintaining or gaining flexibility

Maintaining or improving cardiovascular fitness

Negative future outcomes: in the next 2 months

Getting a knee injury

Getting a shoulder injury

Increased cholesterol levels

Losing endurance

Gaining weight

Losing tone or mass

Getting back problems

Developing a joint or muscle disorder