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# Positive Illusions and Winter Depression: Do Illusions Go the Way of the Summer Sun?

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THESIS APPROVAL

The abstract and thesis of Shannon M. Carey for the Master of Science in Psychology were presented October 2, 1996, and accepted by the thesis committee and the department.

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ABSTRACT

An abstract of the thesis of Shannon M. Carey for the Master of Science in Psychology presented October 2, 1996.

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Traditional psychology has held the view that mentally healthy people have a good grasp of reality. However, studies on self-concept, perceived control and optimism have shown that mentally healthy people have a tendency to distort reality in these areas in a positive, self-serving direction. These studies led Shelley Taylor to coin the term "positive illusions" to describe overly positive self-evaluations, exaggerated perceptions of control, and unrealistic optimism. Taylor also theorized that those who were depressed had fewer positive illusions than those who were not depressed. The current study attempted to extend the foundation of basic research on the concept of positive illusions as well as their relationship to depression. Participants were given questionnaires at two time points (summer and winter) that measured the three components of positive illusions as well as Seasonal Affective Disorder (SAD), or winter depression. It was expected that those who had SAD would be depressed in the winter and therefore have fewer positive illusions at that time than in the summer when they were less depressed. Significant positive correlations between self-concept, perceived control, and optimism indicated shared variance which is consistent with the existence of an underlying variable, i.e. positive illusions. Though results showed no difference in positive illusion scores between

summer and winter, those with higher SAD scores (signifying greater depression) had fewer positive illusions at both time points than those with lower SAD scores. Finally, the remarkable similarity between positive illusion scores at the two time points suggests that positive illusions may exist as a personality trait, rather than being state dependent. Drawbacks of this study and suggestions for future research are discussed.

# POSITIVE ILLUSIONS AND WINTER DEPRESSION: DO ILLUSIONS GO THE WAY OF THE SUMMER SUN?

by

SHANNON M. CAREY

A thesis submitted in partial fulfillment of the
requirements for the degree of

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# Positive Illusions and Winter Depression: Do Illusions Go the Way of the Summer Sun?

Traditional psychology has held the view that the mentally healthy person has a good grasp of reality. This connection with reality has consistently been a main staple in the definition of a mentally healthy individual (Jahoda, 1954; Jourard, 1980 as cited in Taylor & Brown, 1988). However, studies on optimism, self-concept, and perceived control have shown that mentally healthy people actually have a tendency to distort reality in these areas in a positive, self-serving direction (Alloy, Abramson, & Viscusi, 1981; Campbell, 1986; Carver et al., 1993; Taylor & Brown, 1988). These studies led psychologist Shelley Taylor to coin the term "positive illusions".

Positive illusions are made up of three constructs: overly positive self-evaluations, exaggerated perceptions of control or mastery, and unrealistic optimism (Taylor & Brown, 1988). Taylor and Brown believe that positive illusions promote mental health and foster motivation and persistence. This, in turn, leads to accomplishment. In fact, they suggest that the criterion "being in touch with reality" could be taken out of the definition of the mentally healthy person. This leaves "a positive self-regard, the ability to care about others and for the natural world, openness to new ideas and people, creativity, the ability to do productive work, the ability to love, and, finally, the ability to be happy, or, at least, relatively contented" as the defining features of a mentally healthy person (p. 197-198).

Positive illusions may improve the quality of these features of being mentally healthy. Taylor and Brown (1988) write "the capacity for creative, productive

work is fostered both by enhanced intellectual functioning, which may be an outgrowth of positive illusions, and by the increased motivation, activity level, and persistence that are clearly fostered by a positive sense of self, a sense of control, and optimism" ( p. 200). So, positive illusions might be not only a defining feature of a well functioning, mentally healthy person, but could actually improve this functioning.

One of the few empirical studies that included all three constructs of positive illusions looked at them as longitudinal predictors of adjustment in college; adjustment being a reported sense of well-being, and fewer symptoms of stress and ill-health (Aspinwall & Taylor, 1992). For college freshman, higher optimism predicted greater adjustment to college life after the first three months. High self-esteem and greater desire for control were positively related to motivation, which in turn, was positively related to higher GPA at the end of two years.

Another study that used all three constructs attempted to examine the relationship between positive illusions and children's psychological adjustment to divorce (Wolchik & Sandler, 1992). Children who reported more positive illusions in response to hypothetical divorce events showed less aggression and anxiety. It was therefore suggested that positive illusions may protect a child's mental health.

An interesting corollary to this idea that mentally healthy people have positive illusions is that depressed people seem to lack them. In fact, those who are depressed actually seem to have more accurate knowledge about themselves and their situation (Alloy & Ahrens,1987; Alloy, Abramson, & Viscusi, 1981). For example, when students took both the Beck Depression Inventory and the Self-

deception Questionnaire, a negative correlation was found between the results on the two tests. In other words, those who were more depressed were less likely to deceive themselves (Roth & Ingram, 1985). This concept will be explored further in the sections on self-concept, perceived control, and optimism.

The idea of a lack of positive illusions in depressed individuals causes speculation as to how positive illusions function for the mentally healthy. Do they act as a coping mechanism or a defense mechanism to guard against negative (and consequently motivation sapping) information, in order to allow the person to continue having hope for the future? The one paper that addresses this question argues that positive illusions do not increase in response to threat as defense mechanisms do, but rather respond to the utility of the information (Taylor, Collins, Skokan, & Aspinwall, 1989). That is, positive illusions in normal thought respond to the usefulness of negative information and to it's implications for the future. While defense mechanisms distort information, positive illusions seem to be a way people can interpret ambiguous information in the best possible light. It seems certain that positive illusions must serve some sort of adaptive function. If nothing else, they keep people motivated and working toward their goals (Alicke, 1985; Sackeim, 1983; Wolchik & Sandler, 1992). Taylor and Brown suggest that the chief value of positive illusions is that they function as self-fulfilling prophecies, i.e. the more people believe they will succeed, the more they will be motivated and keep trying, and therefore, the more likely they *will* succeed. The idea of the self-fulfilling prophecy will also be explored further in the sections on self-concept, perceived control, and optimism.

There is very little empirical research on positive illusions as a whole. However, studies on all three constructs and their relationship to depression show that unrealistic optimism, enhanced self-concept, and an exaggerated sense of control improve performance on life tasks as well as adjustment to life circumstances.

Self-concept

Self-concept has been defined as "a sense of one's own personal self-worth and social identity" (Myers, 1992). Having a positive self-concept has been shown to have various adaptive advantages (Alicke, 1985). For instance, positive self-appraisals of ability have been associated with working longer and harder at tasks (Felson, 1984) and this perseverance, in turn, is associated with effective performance and attainment of goals (Bandura, 1977; Felson, 1984). In a study by Campbell and Fairey (1985), subjects were asked to solve anagrams. High self-esteem subjects verbalized their expectancies of success more than low self-esteem subjects, and those who verbalized their expectancies of success, actually did succeed more often. In addition, those with high self-esteem tend to attribute failure to causes they can modify ("I failed because I didn't try hard enough. I'll try harder next time.") as opposed to causes they can't modify (" I'm just not smart enough.") (Janoff-Bulman, 1979). This increased success rate for those with high self-esteem seems to hold even for places as far away as Botswana. There, self-esteem was positively related to math and English test scores in high school adolescents (Maqsud & Rouhani, 1991).

Of further interest is the evidence that people, when evaluating themselves, tend to make positive social comparisons (Alicke, 1985). For example, when

college students rated themselves on 154 trait adjectives, they rated themselves much higher on the positive traits than the "average" college student, but lower on the negative traits (Alicke, 1985). People with higher self-esteem will rate themselves as doing better on a task than someone with lower self-esteem, even when their performances are comparable (Shrager & Terbovic, 1976) and people with high self-esteem will take credit for positive events, but will blame situational factors for negative ones to a greater extent than those with lower self-esteem(Taylor & Koivumaki, 1976). This is commonly called a self-serving bias and appears to be related to the attributions mentioned above in the following manner. If it was the situation that caused the failure, it is not some internal fault of the person involved, so that person, in a different situation, can try again and is more likely to succeed.

Also, people have been found to predict more socially desirable behavior from themselves than they actually would perform (Sherman, 1980). This implies that they have a concept of themselves as the type of person who does those desirable things. Even more interesting is that people who have made these errors in predicting their socially desirable behavior will actually perform that behavior more often than when they have not predicted it. In effect, they are self-erasing their errors in prediction. Notice that this is a good example of a self-fulfilling prophecy.

Studies on self-concept and depression found that people who are not depressed overestimate the extent to which other people agree with their opinions. On the other hand, those who are depressed neither overestimate nor underestimate consensus (Campbell, 1986).

Furthermore, people who are depressed or have low self-esteem do the opposite of those with high self-esteem when it comes to their attributions for failure. Depressives are more likely to attribute their failures to something within themselves that is unmodifiable ("I'm not smart enough and there's nothing I can do about it."). If there is nothing they can do about it there is no use in trying, in which case there is no chance to succeed.

Perceived Control

The need for humans to feel competent and in control is a powerful human force (Skinner, 1992). Perceived control has been defined as having three types of beliefs: 1) control beliefs -- beliefs about the degree to which one can produce desired or prevent undesired outcomes 2) means-ends beliefs -- beliefs about whether and how much an event is controllable by any means, and 3) agency beliefs -- beliefs about whether and how much one possesses the means to control an event (Skinner, 1990). Since personal control is most relevant to this study, control beliefs will be described in detail.

People with high perceived control tend to be more action oriented (Brunstein & Olbrich, 1985). That is, they actively try to find solutions to problems. People who are action-oriented don't waste time with non-productive actions or thoughts. One study examined problem solving in two groups of individuals, one with high beliefs in their own personal control and the other with low beliefs. Those with high beliefs were action-oriented which was characterized by problem solving strategies and self-motivating verbalizations such as, "I have to concentrate harder". The behavior of those with low control beliefs was characterized by a large number of inadequate strategies and extended verbalizations of their

emotional states such as, "I'm not in the right mood to concentrate on this stuff" or "I'll just guess and maybe I'll get the right answer".

High perceived control appears to reduce anxiety and depression (Folkman, 1984; Miller, 1980; Taylor, Helgeson, Reed, & Skokan, 1991). It has been suggested that this is due to the minimax rule; having control gives one the ability to minimize maximum future danger (Thompson, 1980).

As another example of a self-fulfilling prophecy, children with high perceived control work harder on math assignments and spend more time studying, but require less time to complete tests and homework assignments (Schmitz & Skinner, 1993). Greater perceived control increases motivation and persistence leading to increased success. As in the old story of the Little Engine That Could, "I think I can" leads to "I thought I could".

According to Skinner (1992), mental health requires feelings of control. Often those feelings of control go beyond what exist in reality. People tend to feel that they have more control when rolling dice or flipping a coin than if someone else does it (Golin, Terrel, & Johnson, 1977). This is clearly an illusion. The term "illusion of control" was coined by Ellen Langer (1975). She demonstrated the concept in studies of people playing several different types of chance games. In general, subjects felt inappropriately confident in the outcome as long as they were the ones in charge of the dice, or the cards, or the choice of lottery tickets.

Depressed people, on the other hand, don't seem to have these illusions of control to the same extent as non-depressed people. When non-depressives and depressives were put in a chance controlled situation but were encouraged to believe they had personal control, non-depressives were far more likely to be

believe they actually were in control than depressives (Golin, Terrell, & Johnson, 1977). An interesting study by Alloy, Abramson, and Viscusi (1981), found that, not only did depressed students give more accurate judgments about how much control they had over an outcome, but non-depressed students with induced depression gave more accurate judgments than they had when not depressed. Similarly, depressed students with induced elation overestimated the degree of control they possessed, just like those who were not depressed.

Optimism

Webster's dictionary defines optimism as "an inclination to put the most favorable construction upon actions and happenings, minimize adverse aspects, conditions, and possibilities, or to anticipate the best possible outcome; a cheerful and hopeful temperament" (Neilson, 1957, pp. 1711). A definition from a psychology text book was stated much more simply, "a generalized expectation that outcomes will be positive" (Gray, 1991, pp. 352).

People high in optimism have been shown to get sick less often than those low in optimism and, once they become sick, highly optimistic individuals experience less distress (Carver, et al., 1993; Scheier & Carver, 1985). For example, women with breast cancer were interviewed about their levels of optimism and distress at diagnosis, 1 day pre-surgery, 10 days post-surgery, and at 3, 6, and 12 month follow-ups. Optimism was related inversely to distress at every interview, even after controlling for prior distress (Carver, et al., 1993). Though the results from this study make intuitive sense, Scheier and Carver's Life Orientation Test (LOT) (1985) was used at every interview (five times in the

space of one year). This creates questions about practice effects since the LOT has only twelve items.

The idea of optimism taken beyond the realm of reality is described nicely by Weinstein (1980). "According to popular belief people tend to think they are invulnerable. They expect others to be the victim of misfortune, not themselves" (pg. 806). This idea exemplifies, not just a cheerful and hopeful temperament, but an error in judgment that could be called a illusion. Weinstein found that 1,258 college students, almost unanimously, estimated their own chances of experiencing positive events above those of the "average" college student and negative events below average. This unrealistic optimism may be a positive and useful error to make in that it can create, once again, self-fulfilling prophecies. High expectations of success cause people to work longer and harder at tasks which increases the chances of succeeding considerably (Weiner, 1979).

As was found with perceived control and self-esteem, depressed individuals seem to be less optimistic than those who aren't depressed. When non-depressed and depressed subjects were asked to rate the likelihood of experiencing positive and negative events, non-depressed subjects rated themselves as having a higher chance for positive events and a lower chance for negative events than most other people. Depressed subjects, in contrast, rated themselves and others as having an equal chance for both positive and negative events (Pyszczynski, Holt, & Greenburg, 1987). A more recent study found that optimism was negatively correlated with depression in female university professors (Marshal & Lang, 1990). One possible conclusion is that depression and optimism are incompatible.

A common theme for all three constructs is that an enhanced self-concept, an exaggerated sense of control, and unrealistic optimism lead people to attempt tasks they might not otherwise have attempted, work longer and harder at them when they do, and therefore succeed more often. If it is true that positive illusions ultimately lead to success, how, then, are they illusions? This is a difficult question to answer. It's paradoxical; the more illusions individuals have, the more likely they will succeed, in which case, the fewer illusions they had in actuality. Perhaps the best way to look at this is in terms of probabilities and specific points in time. People can have illusions at two points in time, 1) before the event has happened and 2) after the event has occurred. A person who believes that the occurrence of an improbable event is highly probable possesses an illusion about that event, even if the event eventually occurs. At the point in time before the event has happened, the difference in subjective and objective probabilities shows that this person maintains an illusion. As Weinberger argued, positive illusions represent a distortion of statistical reality (personal communication to Taylor as cited in Taylor, et. al., 1989). On the other hand, illusions about something that has already occurred are much simpler. If individuals believe they have accomplished a task in better form than they actually have, the illusion is shown in the discrepancy of the belief compared to the actual quality of the accomplishment. So, positive illusion is the appropriate term to describe this phenomenon even if, in the end, illusion turns into reality.

SAD

One form of depression that might have an effect on positive illusions is Winter Depression or winter Seasonal Affective Disorder (SAD). Winter SAD is

characterized by an onset of depressive symptoms sometime from the beginning of October to the end of November, which then disappear anytime from mid-February to mid-April. Symptoms of SAD, in addition to mild to severe depression include; social withdrawal, weight gain, increased appetite, increased eating, carbohydrate craving, hypersomnia, fatiguability, and diurnal variation with worse mood in the afternoon or evening (Bleher & Lewy, 1990).

Mild mood changes, symptoms of winter SAD, and true SAD itself are thought to be caused by the change in the length of day and exposure to light that people receive as the seasons change. This causes a change in people's circadian rhythm, that is, the inner clock that tells people when they should be sleeping and when they should be awake. This change can be so severe that it completely shifts the clock so people are not able to sleep at night, but can't stay awake during the day. This can affect work and home life dramatically, especially with the negative mood shifts that can go along with problems in sleep.

The prevalence of SAD in the normal population in northern latitudes (which includes Portland, Oregon) is approximately 26% (Rosen et al., 1989). Most of the 26% with SAD symptoms don't recognize a seasonal pattern to their symptoms or even that they have "symptoms" at all. The way they feel is attributed to other life factors. Even those diagnosed with clinical depression often go several years before a seasonal pattern is noticed. The actual percentage of people who have mild seasonal mood changes is not currently known but is presumably higher than the 26% mentioned above. In fact, there is evidence that *most* people have some degree of mood and energy change with the changing seasons (Bauer, 1992). Actually, Bauer writes that "the data may be leading us to view seasonality less

as a dichotomy - either you have SAD or you don't - and more as a continuum of severity of winter mood and energy difficulties," (p.1187). Of further interest is research which has discovered gender differences in SAD. Women have winter depression more often than men until menopause, at which time the incidence is the same for both sexes (Rosenthal, 1984).

One of the principle goals of this study was to gain a better understanding of positive illusions and how they work. A longitudinal study investigating how SAD may be related to positive illusions and how positive illusions might change from winter to summer in a normal population could be an important step. For example, because this study is longitudinal, it might tell us whether positive illusions exist as a trait in an individual or if they're state dependent. And, though there are a myriad of studies done on self-concept, perceived-control, and optimism separately, very little empirical research exists on all three constructs together since positive illusions is a fairly new concept. Studying the three constructs together could tell us something about the relationship between them. Therefore, the main goal of this study was to extend the foundation of basic research done on the subject .

Also, past research done on beliefs or cognitions in depressives compared to non-depressives has always been done on separate populations, one depressed and one non-depressed. It was hoped that this study would afford the unique opportunity to examine the differences between depressives and non-depressives in a single population. Thus, a secondary goal of this study was to show how beliefs or cognitions change in a single individual who is in a non-depressed and then depressed state.

Based on previous literature the following hypotheses were derived:

Hypothesis 1: There will be fewer positive illusions in the general population in winter compared to summer. This follows from the assumption that a fairly substantial percentage of the population has a negative mood change in the winter and that negative mood changes create a decrease in, at least, the illusion of control (Alloy, Abramson, & Viscusi, 1981).

Hypothesis 2: Those with higher SAD scores will have fewer positive illusions in winter as compared to those with lower SAD scores. Support for this hypothesis comes from the work suggesting that depressives have fewer positive illusions than those who are not depressed.

## Method

### Participants

The sample consisted of 72 college students, 21 males and 51 females, at Portland State University. The students were those who participated in one of two classes that ran the full academic year, either the Anatomy and Physiology course offered by the Biology Department (n=50), or the Community Psychology course offered by the Psychology Department (n=22). The mean overall GPA for these students was 3.3, and most either felt they were performing as well as they expected in school (n=41), or worse than they expected (n=21). Only nine reported that they were doing better than they expected. The majority of the students were single (n=46).

### Materials

The materials for this study consisted of a cover letter, a sheet for acquiring demographic data such as name, sex, and marital status (age was not collected), and two questionnaires; one that gave a measure of SAD and one that measured the three constructs of positive illusions. The cover letter described the reasons for the experiment (to study SAD and to see if people feel differently in the summer and winter). It also explained what the subjects were expected to do (fill out the questionnaire, once in the winter and once in the early summer), and informed the students that those who were interested could be provided with a summary of the results at the end of the study. The SAD questionnaire was the Personal Inventory for Depression and SAD (PIDS) (Terman, Williams, & Terman, 1991). This inventory consists of four parts. Part One assesses depression, Part Two asks questions about seasonality, Part Three assesses which

months are most "extreme" for the subject, and Part Four asks more about winter symptoms in particular. A copy of this, as well as the following questionnaire, can be found in Appendix A. PIDS is used by researchers in the Sleep and Mood Disorders Lab (SMDL) at Oregon Health Sciences University. PIDS was given to the participants in the same form as it was provided by the SMDL, except for a change in format for easier reading and use (since the computer originally used to create the PIDS form was old and did not have the ability to update the format). However, upon examination of the completed questionnaires it was discovered that the participants found Part Three of the PIDS survey to be extremely confusing and therefore filled out this section inconsistently. It was also discovered that Part Three was difficult to quantify, partially because of inconsistency of the participants, and partly because of the nature of the questions. For these reasons, this section of the survey was dropped from the analysis. The other three parts of PIDS were summed and used as a total score of winter depression.

The second questionnaire (see Appendix A) measured all three aspects of positive illusions (self-concept, perceived control, and optimism) in the form of statements followed by a 6-point scale of agreement (1-strongly disagree to 6-strongly agree). These statements are referred to as "items" throughout the rest of this paper, and each set of items that measure a single aspect of positive illusions is called a "scale". Optimism was measured using the Life Orientation Test (LOT) (Cronbach's a = .76, test-retest reliability = .79), with the 5 point scale shifted to 6 points (Scheier & Carver, 1985). The LOT is commonly used in studies on optimism, having been used in studies of stress, and to explore the

relationship between optimism and illness (Carver et al., 1993; Scheier & Carver, 1985; Scheier, Weintraub, & Carver, 1986).

Self-concept was measured by Rosenberg's self-esteem scale (Rosenberg, 1962) (Guttman's scale coefficient of reproducibility = .92, test-retest reliability = .86) with 5 additional, more general, self-concept items written by the experimenter in order to get a more global measure of self-concept (Cronbach's a = .67). Rosenberg's self-esteem scale has been used to study self-image in adolescents, to compare self-esteem in different races, and to compare groups of low and high self-esteem subjects (Rosenberg, 1965; Rosenberg & Simmons, 1972; Shrauger & Terbovic, 1976). The five additional items measure self-concept in the domains of work, school, social relationships, and driving ability. For example, "I am a better driver than most drivers".

Since most well-established measures of control are designed to assess locus of control, the experimenter developed a measure of perceived control. This measure consisted of five items that reflect internal control from Rotter's Internal-External control scale (Rotter, 1966) and 10 items written by the experimenter. These were concerned with the extent to which the subjects feel they have control over specific events and outcomes in the domains of work, parenting, social relationships and crisis situations. For example, "I generally react worse in a crisis situation than most people". (Cronbach's a = .63).

There was a possibility that the students' performance in school at the time they took the survey might confound the results. For example, if they were getting a lower grade than they hoped for, they may be depressed and therefore, have fewer positive illusions. In order to help control for this, the questionnaire

had two final items. One asked students how well they felt they were doing in school (worse than expected, about as expected, or better than expected) and the second asked for their current GPA.

Procedure

The students who participated in the study were told that experimenter was a doctoral student at Portland State University and that she was performing the study for her thesis. The students were given a cover letter which explained that the reasons for the study were to examine winter depression and whether people feel differently in the summer and winter.

The students who agreed to participate were given the SAD and positive illusion questionnaires in class in late November. In order to maintain anonymity, the students were asked to provide their mother's maiden name and the month and day of their birth in the space provided on the first page of the positive illusion questionnaire. It was explained that, in this way, all of the information given would be anonymous, but would enable the experimenter to match winter and summer questionnaires to single participants.

The necessity of taking the first measurement in late November meant that the students were caught within two weeks of finals. This was also the case for the second measurement, taken in late May. So, if there was an effect on the results due to the stress at that time, it should have appeared in the measurements at both points. Students who participated in the study were offered the opportunity to receive a summary of the results at the end of the study, as well as information on SAD and the light and drug therapies available to treat it.

At the end of May the positive illusions questionnaire and the demographics sheet (to check for changes such as address or marital status) were given to all the students in the Anatomy and Physiology and the Community Psychology class, whether or not they had filled out the winter questionnaires. The SAD questionnaire was not provided again since it was a one time, retrospective measure.

A total of 153 students filled out the questionnaire in the winter and 155 filled it out the in the summer. Only the 72 who filled out the questionnaire at both time points were used in the study.

## Results

### Descriptive Statistics

To test the reliability of the scales for each aspect of positive illusions, separate Cronbach's alpha coefficients were computed for optimism, perceived control, and self-concept. (Cronbach's alpha is a measure of the "internal consistency" of a scale. It is based on the average covariance or correlation of items within a test.) Any items phrased negatively were recoded so that a higher number reflected higher perceived control, higher optimism, or a more positive self-concept. Table 1 (see Appendix B) provides descriptive statistics and the estimates of internal reliability for each of the three scales. These statistics include those participants who filled out the questionnaire at only one time point. All three scales showed acceptable levels of reliability. For the rest of the analyses, each participant's rating of the individual items within each aspect of Positive Illusions were summed to create the construct variables; optimism

(possible range: 8 to 48), perceived control (possible range: 14 to 84), and self-concept (possible range: 17 to 102).

Independent t-tests were performed comparing those included in the study (who filled out the questionnaire at both time points, winter and summer) to those who completed the questionnaire in just the winter or just the summer (referred to as the "winter group" and "summer group" respectively). (See Table 2). The means for both GPA and the aspect of perceived control were significantly different between those kept in the study and the winter group, with the winter group having both a lower GPA ($t=2.57$, $p=.011$) and lower perceived control ($t=2.33$, $p=.021$). There was no significant difference in the means for SAD, optimism, self-concept, or perceived performance in school. The results were virtually identical when comparing the summer group and those kept in the study. The summer group had both a lower GPA ($t=3.07$, $p=.003$) and lower perceived control ($t=2.56$, $p=.012$). There was no significant difference in the means for any other tested variable.

Table 3 provides correlations between the three aspects of positive illusions in the summer and winter for the 72 participants who were kept in the study. There were significant positive correlations between all three aspects of positive illusions; optimism, self-concept, and perceived control in both winter and summer. There were no significant correlations between gender and positive illusions.

Correlations between SAD scores, GPA, perceived performance in school and the three aspects of positive illusions in both winter and summer are given in Table 4. There were significant negative relationships between scores for SAD

and summer scores on optimism, perceived control, and self-concept. That is, as the depression score increased (signifying more depression), positive illusions decreased. However, only winter optimism showed a significant negative correlation with SAD. There were also significant correlations between perceived performance in school and optimism in both summer and winter, and between winter perceived performance in school and summer self-concept. There were no significant relationships between gender and any of the above variables.

Hypotheses Testing

Paired t-tests were used to test the first hypothesis that there would be fewer positive illusions in the general population in the winter than in the summer. There was no significant difference between the means for summer and winter for any of the three aspects of positive illusions; optimism ($t=.32$, $p=.747$), perceived control ($t=.27$, $p=.787$), or self-concept ($t=1.21$, $p=.230$). (See Table 5). Participants were remarkably consistent in positive illusions across the seasons.

A two-step hierarchical regression was performed for each component of positive illusions in order to test the second hypothesis that those with higher SAD scores would have fewer positive illusions in the winter compared to those with lower SAD scores. This hypothesis suggests an interaction between summer positive illusions and SAD for winter positive illusions. Though the survey was administered in the winter first, the regression was performed with summer positive illusion scores as a predictor of winter scores. This was because positive illusions were expected to vary with SAD scores in the winter but not in the summer. In the summer, individuals' positive illusion scores were expected to be fairly equivalent. Table 6 provides the steps for each regression along with the

$R^2$s. In step 1 for the aspect of optimism, winter optimism was entered as the independent variable with SAD and summer optimism as the dependent variables, $R^2 = .56686$. In step 2 SAD, summer optimism, and the interaction term (SAD X summer optimism) were entered, $R^2 = .57053$. The increment in $R^2 = .004$, which is not significant, so the effect of SAD on optimism is the same in summer and winter. Equation 1 shows the standardized regression equation for step 1 of the analysis and equation 2 shows the standardized regression equation for step 2.

(Equation 1) Winter optimism = -.1860(SAD) + 7.897(summer optimism)

(Equation 2) Winter optimism = -.1884(SAD) + 4.452(summer optimism)
- .3638(SAD x SO)

It should be noted, since the interaction was not significant, that the main effects of both SAD and summer optimism were significant, $R^2 = .56686$, $F(2, 64) = 41.88$, $p=.0000$. As SAD increases (signifying more depression), winter optimism decreases ($t=-2.165$, $p=.0341$) and summer optimism is an excellent predictor of winter optimism ($t=7.897$, $p=.000$).

In step 1 for the aspect of perceived control, the independent variable was winter self-concept and the dependent variables were SAD and summer perceived control, $R^2 = .33980$. Step 2 was the addition of the interaction variable (SAD X summer self-concept), $R^2 = .34139$. The increment in $R^2 = .001$, which was not significant. So, like optimism, the effect of SAD on perceived control is the same in summer and winter. Standardized equations 3 and 4 for steps 1 and 2 of the regression follow.

(Equation 3) Winter perceived control = .1729(SAD) + .6381(summer perceived control)

(Equation 4) Winter perceived control = -.2733(SAD) + .5720(summer perceived control) -.4231(SAD x SPC)

Also similar to optimism was the significant $R^2$ for step 1 of the hierarchical regression, $R^2$ = .33980, F(2, 64) = 16.47, p=.000. In this case, however, the significance of the main effect is due solely to the predictive ability of summer perceived control for winter perceived control (t=5.639, p=.0000). The b for SAD was not significant (t=1.528, p=.1315).

In general, the results of the hierarchical regression for the aspect of self-concept was the same as that for perceived control. The increment in $R^2$ = .001, which was not significant. So the effect of SAD on self-concept is the same in summer and winter. The significant $R^2$ of step 1 of the regression, $R^2$ = .4946, F(2,63) = 30.83, p=.0000, reflects the ability of summer self-concept to predict winter self-concept (t=7.380, p=.0000). The standardized equations 5 and 6 for step 1 and step 2 of the self-concept hierarchical regression follow.

(Equation 5) Winter self-concept = -.0258(SAD) + .6949(summer self-concept)

(Equation 6) Winter self-concept = -.4212(SAD) + .6226(summer self-concept) + .3816(SAD x SSC)

Other analyses

In order to examine the idea that positive illusions are lower in those who are depressed compared to those who are not, the participants were arranged by winter depression score from highest to lowest and then divided into three even

groups. The means of the two groups with the highest and lowest winter depression scores were compared for each of the three aspects of positive illusions in both summer and winter. Table 7 provides means and standard deviations for each cell and the results of the independent t-tests for optimism, perceived control, and self-concept. There was a significant difference in the means for optimism in both summer ($t=2.70$, $p=.010$) and winter ($t=3.16$, $p=.003$), with those who were less depressed showing higher optimism scores. For perceived control and self-concept, however, the differences in the means between the depressed and non-depressed groups were significant only in the summer with $t=4.32$ for summer perceived control ($p=.000$) and $t=2.59$ for summer self-concept ($p=.013$). The group with higher depression scores had lower perceived control and worse self-concept. In contrast, the difference in means for the winter scores of perceived control ($t=1.86$, $p=.069$) and self-concept ($t=1.74$, $p=.089$) were not significant.

## Discussion

The purpose of this study was to gain a more complete understanding of the concept of positive illusions, in particular, the relationship between positive illusions and depression. It was hoped that seasonal affective disorder would reveal an effect, within a single individual, of depression and non-depression on the three components of positive illusions; optimism, perceived control, and self-concept.

It has been argued that mentally healthy people maintain positive illusions in the face of negative information, not by ignoring the information which could be counter productive or dangerous, but by assimilating the information and adapting their positive illusions to it (Taylor, Collins, & Skokan, 1989). For example, a student may perceive herself as an "A Student" and base at least some of her sense of self-worth on her grades. However, upon reading her report card at the end of the term she discovers that she has received B's and C's in all her classes. She can restructure her illusions in several ways. One might be, "I did A level work. I just had bad professors who didn't see my worth. I'll have better professors next term." Another might be, "I normally do A level work. I just had a bad term. I'll work harder next term." Or even, "I may not always do A level work, but I am still a person of worth". It is conceivable that this student, without restructuring her positive illusions, might decide that there was no use in continuing in school. On the other hand, adjusting her positive illusions may cause her to work harder and actually achieve A level work in the future. As Taylor and Brown (1989) remarked, under negative circumstances "the belief in one's self as a competent, efficacious actor behaving in a world with a generally

positive future may be especially helpful in overcoming setbacks, potential blows to self-esteem, and potential erosions in one's view of the future" (p. 201).

Further, according to Taylor and Brown (1989), depressed people seem to lack the ability to maintain positive illusions under negative circumstances. It would follow that, without these positive beliefs about themselves and their future, it would be difficult to go on (e.g. "I see nothing good for myself in the future, so why bother getting up this morning?"). The problems with sleep and mood caused by SAD can affect quite a large section of the population (26% in northern latitudes) regardless of type of work and station in life, since most people have to live through the changes of the seasons. A lessening or disappearance of positive illusions in a significant portion of the population *might* have explained, for instance, the difficulty people have getting through problems associated with the winter holidays and the increase of suicides at that time of year.

This study was undertaken in hopes of answering several questions: 1) What sort of information does the study of all three components of positive illusions together reveal? 2) Do depressed people truly have fewer positive illusions than those who are non-depressed? 3) Do individuals' positive illusions change with the seasons? (This led to the two hypothses) and 4) Are positive illusions a trait, or are they state dependent?

Significant positive correlations were found among participants scores on self-concept, perceived control and optimism in both the summer and the winter. These correlations indicate shared variance which is consistent with the existence of an underlying variable, i.e. positive illusions. In other words, these

correlations support the notion put forth by Taylor and Brown, that the three constructs *together* make up a new variable which they call positive illusions. It is unsurprising to find shared variance among these three constructs. Taylor and Brown (1989) write that "many theorists...have maintained that that a sense of personal control is integral to the self-concept and self-esteem"(pg.196) and that "those with low self-esteem appear to entertain more balanced estimates of their likely future circumstances" (pg.197) (while those with "normal" or higher levels of self-esteem tend to have unrealistically high optimism). These statements indicate a logical connection between these three concepts.

Those who had higher scores on the SAD scale (signifying more depression) had lower scores on self-concept, perceived control, and optimism. Taylor and Brown (1989) cite several studies in each of the three areas respectively that have found that those who are mildly depressed have a poorer self-concept, less perceived control, and less optimism than those who are not depressed. The current study supports these findings with the added benefit that all three constructs were examined in the same individuals, which gives further evidence for Taylor and Browns suggestion that those who are depressed have fewer positive illusions than those who are not.

Scores on self-concept, perceived control, and optimism were not significantly different from summer to winter, therefore, the first hypothesis, that the general population has fewer positive illusions in the winter than in the summer, was not supported. In fact, the positive illusion scores at the two time points were remarkably similar. This was true whether the individual scored high or low on the SAD scale. This is possibly due to the SAD scale itself. PIDS was originally

designed to be followed by a clinical interview in order to clarify any ambiguous results and to confirm a diagnosis of SAD. It is likely, especially considering the results that show variance in positive illusions with depression score, that the PIDS questionnaire picked up depression in general, but not winter depression specifically.

The effect of SAD on self-concept, perceived control, and optimism was the same in both summer and winter. In other words, those with higher SAD scores had the same difference in positive illusions from summer to winter (i.e. no difference) as those with lower SAD scores. Hence, the second hypothesis, that those with higher SAD scores would have fewer positive illusions in the winter compared to those with lower SAD scores, (i.e. a greater change from summer to winter), was not supported. Moreover, scores on self-concept, perceived control, and optimism in the summer were excellent predictors of those scores in the winter. The higher the positive illusion score in the summer the higher it was in the winter.

In the introduction to this paper, it was suggested that this research could tell us whether positive illusions existed as a trait of an individual or whether they were state dependent. The uniformity of results in individuals over a six month period, and the excellent predictive powers of summer scores for winter scores, clearly supports the conceptualization of positive illusions as a consistent trait. So the degree of positive illusions people express might be considered a measure of their basic personality.

Limitations

There are several limitations to be addressed in this study. The first, as mentioned earlier, is the possibility that PIDS (the SAD questionnaire) did not measure *winter* depression specifically but instead measured depression in general. This could mean that, though there were several individuals with high scores on the PIDS, none of the participants actually had true SAD.

This leads to a second limitation. It is possible that college students are not representative of the general population in that they may be more ambitious and hopeful for the future and therefore less depressed, or, that they are not representative of the population with *winter* depression in particular. That is, since the majority of school work must be completed during the winter months, only those capable of working during that time would successfully stay in school. It is conceivable that the students of the most interest to this study (those who had moderate to severe SAD) were the very students who dropped out at one time point or the other.

This, in turn, leads to a third limitation. Those who took the survey at only one time point (summer or winter) had both a lower GPA and lower perceived control than those who were present at both time points. The lower GPA and lower perceived control was not surprising in those who took the survey only in the winter. Their absence at the end of spring term could be explained by their poor grades and lack of feelings of control, at least in the context of school. However, the identical results of those who were missing in the winter but participated in the summer is harder to explain. Perhaps the absence of these students during fall term shows an inconsistency in their commitment to school

which is reflected in both their grades and their feelings of control over themselves and their situation. Or, as suggested above, those students who were unavailable at the end of fall term may have been missing precisely because they were experiencing winter depression severe enough to keep them from attending school. It follows, then, that this sample may have had limited variability because those who stayed in school and agreed to fill out the survey were those without symptoms of SAD severe enough to keep them from participating.

And finally, it is always possible that the scales for self-concept, perceived control, and optimism were not measuring illusions but were measuring the actual state of affairs. However, the mean scores for each of the three constructs were above average which suggests that the majority of participants said they believed they were "better" in the three areas than most others (e.g. I generally react better in a crisis situation than most other people). Since, logically, this is very unlikely, it implies the manifestation of some illusions.

Future Research

The limitations of this study, as well as the lack of basic research on the topic of positive illusions leaves much room for future work. Though the results of this study did show a uniformity of positive illusions from winter to summer, this does not rule out that people with a clinically confirmed diagnosis of winter depression would show a seasonal change. Especially if, as suspected, the PIDS questionnaire does not pick up winter depression without the help of a clinical interview. It would be of interest to repeat this study with a population who have been clinically diagnosed with SAD.

Another future research possibility would be to explore more deeply the positive correlations between self-concept, perceived control, and optimism. Perhaps look for causal directions between the three concepts. For example, an individual's feelings of control could be experimentally manipulated and any resulting change in self-concept and optimism could be measured.

A third direction for future research would be to examine whether, and how well, positive illusions buffer individuals in the face of negative information. Will positive illusions always result in people working harder and more persistently at tasks when they are not succeeding, or could it be that those with unusually high expectations of the self, when confronted with negative information, will experience a more severe "fall" than those who expect less?

A fourth, and final, suggestion for future research is, possibly, the most important for basic research on the global concept positive illusions. That is a study that examines their actual existence. As described previously in this paper, research has already been conducted that gives evidence for the existence of illusions in each of the three areas separately. Shrager and Terbovic's (1976) work showed that people with higher self-esteem will rate themselves as doing better on a task than those with lower self-esteem, even when the performances are comparable. Ellen Langer (1975) showed that people felt inappropriately confident (in control) during chance games, as long as they were the ones in charge of the dice, cards, or lottery tickets. And Weinstein (1980) showed that college students, almost unanimously, estimated their own chance of experiencing a positive event as much higher than the "average" persons. A repetition of all three studies in a single population could give a much clearer idea of whether

illusions in the areas of self-concept, perceived control, and optimism occur simultaneously in individuals.

Summary

This study has lent support to Taylor and Brown's concept of positive illusions as a combination (or underlying variable) of optimism, perceived control, and self-concept as well as their suggestion that positive illusions decrease with increasing depression. It also supports the notion that positive illusions may exist as a consistent personality trait rather than changing with the state of the individual. The results and limitations of this study suggest a need for further research on positive illusions, both alone and in their relationship to depression. The idea that the mentally healthy individual may not be as firmly connected with reality as previously believed is an intriguing and, if true, extremely important concept in need of further exploration.

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# APPENDIX A

**Please fill out the following page before completing the questionnaire.**

Your mother's maiden name _____

Your birth month and day __/__

Sex: M F

Marital status:

single co-habitating married divorced widowed

Have you moved recently (within the last year)? Y N

How well do you feel you are doing in school this term?

Worse than expected about as expected better than expected

What is your overall G.P.A.? _____

**After each statement please circle the number that best expresses how much you agree or disagree with the statement.**

---

1) Whether or not I succeed at school is mostly up to fate.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

2) I can get better at tests through practice.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

3) I have influence over what other people think of me.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

4) I am a better student than most other students.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

5) When I walk into my classes at school, I know I am smarter than most of the other people in the room.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

6) Whether I do well in school is under my control.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

7) I have influence over what my professor thinks of me.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

8) I am worse at accepting criticism than most people.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

9) I cope with serious problems better than most people.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

10) I generally react better than most people in a crisis.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

11) I have influence over what my professor thinks of my work.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

12) I can produce good work when I put my mind to it.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

13) I can make the world a better place.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

14) Many times I feel that I have little influence over the things that happen to me.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

15) There is not much use in trying to hard to please people, if they like you, they like you.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

16) What happens to me is my own doing.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

17) Capable people who fail to become leaders have not taken advantage of their opportunities.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

18) The average citizen can have an influence in government decisions.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

19) When I make plans I am almost certain I can make them work.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

20) I am better at my job than most people in my line of work.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

21) I am a better driver than most other drivers.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

22) I work harder than most people at work.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

23) I hardly ever expect things to go my way.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

24) I feel that I have a number of good qualities.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

25) In uncertain times, I usually expect the best.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

26) On the whole, I am satisfied with myself.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

27) I wish I could have more respect for myself.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

28) I always look on the bright side of things.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

29) I feel that I do not have much to be proud of.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

30) I'm always optimistic about my future.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

31) I take a positive attitude toward myself.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

32) I certainly feel useless at times.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly | Disagree | Mildly | Mildly | Agree | Strongly |

| | | | | | |
|---|---|---|---|---|---|
| disagree | | disagree | agree | | agree |

33) Things never work out the way I want them to.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

34) I feel that I am a person of worth, at least on an equal plane with others.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

35) I am able to do things as well as most other people.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

36) At times I think I am no good at all.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

37) All in all, I am inclined to think that I am a failure.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

38) If something can go wrong for me it will.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

39) I'm a believer in the idea that every cloud has a silver lining.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |

40) I rarely count on good things happening to me.

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|

| Strongly disagree | Disagree | Mildly disagree | Mildly agree | Agree | Strongly agree |
|---|---|---|---|---|---|

**Please circle a yes or no response only if you are quite sure about it. If you are unsure, circle a question mark.**
In the last year, have you had any single period of time - lasting for two weeks - in which any of the following circumstances was present nearly every day? (Of course, you may have had several such periods.)

**Were there two weeks or more when...**

1) You had trouble falling asleep, or staying asleep, or were sleeping too much?

yes no ?

2) You were feeling tired or had little energy?

yes no ?

3) You experienced poor appetite or overeating? Or significant weight gain or loss, although you were not dieting?

yes no ?

4) You found little interest or pleasure in doing things?

yes no ?

5) You were feeling down, depressed, or hopeless?

yes no ?

6) You were feeling bad about yourself - or that you were a failure - or that you were letting yourself or your family down?

yes no ?

7) You had trouble concentrating on things, like reading the newspaper or watching television?

yes no ?

8) You were so fidgety or restless that you were moving around a lot more than usual? Or the opposite - moving or speaking so slowly that other people could have noticed it?

yes no ?

9) You found yourself thinking a lot about death or that you would be better off dead, or even of hurting yourself?

yes no ?

**Circle <u>one</u> number on each line to indicate how much of the following behaviors or feelings <u>changes with the seasons</u>.** (For instance, you may find you sleep different hours in the winter than in the summer.)

1) Change in your total sleep length, including nighttime sleep and naps.

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

2) Change in your level of social activity, including friends, family, and co-workers.

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

3) Change in your general mood, or overall feeling of well being.

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

4) Change in your weight.

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

5) Change in your appetite (both food cravings and the amount you eat).

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

6) Change in your energy level.

| 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| no change | slight change | moderate change | marked change | extreme change |

**For each of the following behaviors or feelings, please draw a circle around all the applicable months. If no particular month stands out for any item, circle "none". You should circle a month only if you recollect a distinct change in comparison to other months, occurring for several years. You may circle several months for each item.**

1) I tend to feel worst in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

2) I tend to eat most in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

3) I tend to gain the most weight in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

4) I tend to sleep most in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

5) I tend to have the least energy in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

6) I tend to have the lowest level of social activity in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

7) I tend to feel best in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

8) I tend to eat least in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

9) I tend to lose the most weight in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

10) I tend to sleep least in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

11) I tend to have the most energy in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

12) I tend to have the highest level of social activity in:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Non |

**In comparison to other times of the year, during the winter months, which - if any - of the following circumstances tend to be present?**

1) I tend to sleep longer hours (napping included).

yes no ?

2) I tend to have trouble waking up in the morning.

yes no ?

3) I tend to have low daytime energy, feeling tired most of the time.

yes no ?

4) I tend to feel worse, overall, in the late evening than in the morning.

yes no ?

5) I tend to have a distinct temporary slump in mood or energy in the afternoon.

yes no ?

6) I tend to crave more sweets or starches.

yes no ?

7) I tend to eat more sweets or starches, whether or not I crave them.

yes no ?

8) I tend to crave sweets, but mostly in the afternoon and evening.

yes no ?

9) I tend to gain more weight than in the summer.

yes no ?

## APPENDIX B

**Table 1:** Descriptive Statistics and Reliability Estimates for Positive Illusions

| **Winter** | N | Item Means | Scale means | SD | Chronbach's α |
|---|---|---|---|---|---|
| Optimism | 152 | 4.34 | 34.72 | 5.55 | 0.78 |
| Perceived Control | 153 | 4.45 | 62.24 | 6.66 | 0.72 |
| Self-concept | 152 | 4.41 | 75.04 | 9.00 | 0.84 |
| **Summer** | N | Item Means | Scale means | SD | Chronbach's α |
| Optimism | 153 | 4.28 | 34.22 | 6.23 | 0.83 |
| Perceived Control | 154 | 4.43 | 62.02 | 6.27 | 0.69 |
| Self-concept | 153 | 4.44 | 75.46 | 9.37 | 0.85 |

**Table2:** Comparison of Those Included (I) in Study to Those Not-Included (NI).

| | | | N | Mean | SD | t-value | p |
|---|---|---|---|---|---|---|---|
| **Summer:** | Optimism | NI | 82 | 33.65 | 6.00 | -1.20 | 0.233 |
| | | I | 71 | 34.87 | 6.48 | | |
| | Perceived Control | NI | 83 | 60.85 | 6.30 | -2.56 | 0.012 |
| | | I | 71 | 63.39 | 6.00 | | |
| | Self-concept | NI | 82 | 74.57 | 9.61 | -1.26 | 0.209 |
| | | I | 71 | 76.47 | 9.05 | | |
| | GPA | NI | 78 | 3.15 | 0.46 | -3.07 | 0.003 |
| | | I | 66 | 3.36 | 0.39 | | |
| | Perceived Performance | NI | 83 | 1.91 | 0.59 | 1.17 | 0.245 |
| | | I | 70 | 1.80 | 0.63 | | |
| **Winter:** | Optimism | NI | 81 | 34.47 | 5.46 | -0.6 | 0.549 |
| | | I | 71 | 35.01 | 5.68 | | |
| | Perceived Control | NI | 82 | 61.10 | 7.00 | -2.33 | 0.021 |
| | | I | 71 | 63.56 | 6.04 | | |
| | Self-concept | NI | 82 | 74.79 | 9.28 | -0.37 | 0.711 |
| | | I | 70 | 75.34 | 8.73 | | |
| | GPA | NI | 75 | 3.16 | 0.42 | -2.57 | 0.011 |
| | | I | 66 | 3.33 | 0.39 | | |
| | Perceived Performance | NI | 81 | 1.79 | 0.67 | -0.36 | 0.718 |
| | | I | 70 | 1.83 | 0.64 | | |

**Table 3:** Correlations Between Positive Illusions in Summer (S) and Winter (W).

| | (S) Optimism | (S) PC | (S) SC | (W) Optimism | (W) PC | (W) SC |
|---|---|---|---|---|---|---|
| Optimism (S) | 1.000 | | | | | |
| Perceived Control (S) | .6191** | 1.000 | | | | |
| Self-concept (S) | .6706** | .3728** | 1.000 | | | |
| Optimism (W) | .7228** | .3490** | .6267** | 1.000 | | |
| Perceived Control (W) | .3639** | .5545** | 0.1947 | .3490** | 1.000 | |
| Self-concept (W) | .5204** | .3728** | .6886** | .6267** | .3769** | 1.000 |

Note: * $p < .05$ ** $p < .01$

**Table 4:** Corellations Between Positive Illusions and GPA, Perceived Performance (PP), and SAD

| | GPA (S) | PP (S) | GPA (W) | PP (W) | SAD |
|---|---|---|---|---|---|
| Optimism (S) | .1974 | .2092 | .2391 | .2586** | -.2869** |
| Perceived Control (S) | .1652 | .1149 | .2029 | .1545 | -.4407** |
| Self-concept (S) | -.0011 | .1776 | .1030 | .2614* | -.3116* |
| Optimism (W) | .2075 | .2926* | .2744* | .3458** | -.3805** |
| Perceived Control (W) | .1614 | .0706 | .1534 | .0905 | -.1084 |
| Self-concept (W) | .1012 | .1927 | .1092 | .2312 | -.2404 |
| GPA (S) | 1.0000 | .2026 | .8503** | .0633 | -.0355 |
| Performance (S) | .2026 | 1.0000 | .0634 | .2497* | -.1131 |
| GPA (W) | .8503** | .0634 | 1.0000 | .1977 | -.0400 |
| Performance (W) | .0633 | .2497* | .1977 | 1.0000 | -.0882 |

Note: * $p < .05$ ** $p < .01$

**Table 5:** Means, SD's, and t-values for Summer vs. Winter Positive Illusions

| | N | Mean | SD | t-value | p |
|---|---|---|---|---|---|
| Optimism (S) | 72 | 35.04 | 5.65 | 0.32 | .747 |
| Optimism (W) | 72 | 34.87 | 6.43 | | |
| Perceived Control (S) | 72 | 63.56 | 5.99 | 0.27 | .787 |
| Perceived Control (W) | 72 | 63.38 | 5.96 | | |
| Self-Concept (S) | 71 | 75.35 | 8.67 | -1.21 | .230 |
| Self-Concept (W) | 71 | 76.35 | 9.07 | | |

**Table 6:** Hierarchical Regression for Effect of SAD on Positive Illusions

| | $R^2$ | R Inc | Inc F | Sig |
|---|---|---|---|---|
| Regression 1: | | | | |
| Winter Optimism | | | | |
| Step 1: Optimism (S) and SAD | .5669 | .004 | .5880 | ns |
| Step 2: Optimism (S) , SAD, and Optimism X SAD | .5705 | | | |
| Regression 2: | | | | |
| Winter Perceived Control | | | | |
| Step 1: Perceived Control (S) and SAD | .3398 | .001 | .0950 | ns |
| Step 2: Perceived Control (S), SAD and Perceived Control X SAD | .3414 | | | |
| Regression 3: | | | | |
| Winter Self-Concept | | | | |
| Step 1: Self-Concept (S) and SAD | .4946 | .001 | .1250 | ns |
| Step 2: Self-Concept (S), SAD and Self-Concept X SAD | .4963 | | | |

**Table 7:** Means, SD, and T-values for Positive Illusions, Depressed vs. Non-Depressed

| **Summer** | N | Mean | SD | t-value | p |
|---|---|---|---|---|---|
| Optimism | | | | | |
| Low Depression | 22 | 38.09 | 7.08 | 2.70 | .010 |
| High Depression | 22 | 33.00 | 5.26 | | |
| Perceived Control | | | | | |
| Low Depression | 22 | 67.45 | 5.68 | 4.32 | .000 |
| High Depression | 22 | 60.89 | 4.33 | | |
| Self-Concept | | | | | |
| Low Depression | 22 | 80.52 | 9.59 | 2.59 | .013 |
| High Depression | 22 | 73.98 | 6.95 | | |
| **Winter** | | | | | |
| Optimism | | | | | |
| Low Depression | 22 | 37.82 | 5.94 | 3.16 | .003 |
| High Depression | 22 | 32.48 | 5.26 | | |
| Perceived Control | | | | | |
| Low Depression | 22 | 65.50 | 5.15 | 1.86 | .069 |
| High Depression | 22 | 62.59 | 5.21 | | |
| Self-Concept | | | | | |
| Low Depression | 21 | 77.81 | 9.99 | 1.74 | .089 |
| High Depression | 22 | 73.02 | 7.83 | | |