

The Effect of Optimism on Physical Illness

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### **The Effect of Optimism on Physical Illness**

There is a general consensus that psychological factors, such as aspects of personality, are related to physiological health. A meta-analysis by Friedman and Booth-Kewley (1987), found that the size of the relationships between personality and disease was found to be comparable to that which exists between many well-known risk factors and disease. In fact, Friedman and Booth-Kewley speculated that personality might be just as strong of a cause of disease as common risk-factors such as smoking, lack of exercise, and obesity. Friedman and Booth-Kewley (1987) found that depression was most closely correlated with coronary heart disease ( $r = 0.238$ ) and anxiety with asthma ( $r = .362$ ), ulcers ( $r = .186$ ), arthritis ( $r = .200$ ), and headaches ( $r = .205$ ). The link between personality and illness cannot simply be “folklore” (Friedman & Booth-Kewley, 1987); there is more to it .

Another personality factor correlated with disease is optimism. Perhaps optimism leads people to take preventive measures against illness, or it reduces the effect of stress. With a positive outlook on life, a person may not have the expectation that their health will take a turn for the worse. Studies have found a correlation between optimism and cardiovascular disease. Dispositional optimism is defined by Scheier and Carver (1982) as a general expectation of positive outcomes, not to be confused with a specific expectation about one’s health outcome. Boehm and Kubzansky (2012) explored the association between positive psychological well-being (PPWB) and cardiovascular disease (CVD) by reviewing past research. Among the many factors considered of PPWB, optimism had the greatest association with reduced cardiovascular events. Boehm and Kubzansky (2012) found that optimism was associated with being less likely to engage in problem drinking, increased physical activity, getting enough sleep and falling asleep faster, healthier food consumption, slower rate of carotid atherosclerosis progression,

activation of the parasympathetic nervous system, longer telomere lengths in postmenopausal women, and reduced body fat at the end of a cardiac rehabilitation program. Scheier et al. (1989) found that dispositional optimism was associated with a faster rate of recovery from coronary artery bypass surgery in the short-term. Optimism measured at one point in time has also been found to correlate with CVD and CVD-related mortality years later, even after controlling for CVD risk factors and depression (Guiltay et al., 2004, Guiltay et al., 2006, Tindle et al., 2009). The limitation of the past research mentioned, is that they only show correlation and not causation. This research only indicates a relationship between optimism and health; good health could cause optimistic attitudes or optimistic attitudes could be the cause of good health. For instance, if a person experiences frequent illness, perhaps that makes him more fatalistic about life in general. This lack of causal relationship is the limitation of past correlational research.

An experimental approach to optimism, in which an intervention is used to manipulate participants' optimism, enables researchers to identify optimism as the cause of health outcomes. One study in particular used an optimism boosting exercise as a means to manipulate optimism (King, 2001). King (2001) created the Best Possible Self (BPS) writing exercise, in which the subject visualizes a future in which everything has turned out in the most desirable way. Goals have been achieved and life is perfect. This exercise is intended to ask people about their high-level life goals and have them write about them. Perhaps the participant has never considered their optimal future self and their goals never existed until they were asked to type them out. On the other hand, if their goals have existed, perhaps the writing process causes the goals to become more specific and clear. In either scenario, this writing exercise is effective. In this study, participants completed the writing exercises for four consecutive days. King found that at post-writing, participants in the BPS-only condition visited the campus health clinic significantly less

often than participants in the control groups. Use of the BPS in subsequent research has confirmed its effectiveness as a manipulation of optimism. Meevissen et al. (2011) conducted a modified version of King's BPS experiment, and had their participants write about their BPS for one day and then visualize their BPS everyday for two weeks. They did not measure the effect on health, but measured the effectiveness of the BPS intervention on optimism over the course of the two weeks. A sustained increase in optimism was observed.

If optimism does provide protection against illness, how does it work? One possibility is that it simply elevates positive affect. This evidence comes from a study done by Burton and King (2009), in which participants wrote about intense positive experiences (IPE) to create positive affect, which led to improved health. The fact that a writing exercise similar to the BPS, which focused only on positive experiences, had a similar effect on illness suggests that optimism could have its effect on health just by fostering positive affect. This could be a reason why the BPS writing exercise was so effective, and it is a reason to explore the use of writing exercises with a positive emotional focus as a control for the experimental condition. The trauma condition in King's (2001) study was limited in controlling for optimism because it does not rule out positive affect as a mediator. The trauma writing prompt in King (2001) was described as upsetting by participants. This topic has a negative emotional focus. Pennebaker et al. (1997) and Pennebaker and Seagal (1999) suggest that negative emotional focus is not a required characteristic of essays that are associated with health improvements, and that the pattern most characteristic of beneficial writing included high levels of positive emotion words and increasing insight over the course of writing for participants writing about traumatic life experiences. Both Pennebaker's (1997) and Burton and King's (2009) findings suggest that King's BPS writing exercise may have been effective because it leads to positive affect, not because it fostered

optimism. In order to rule out positive affect as a mediator of optimism, King (2001) should have added a control condition that encouraged high positive affect and insight but did not increase optimism, as optimism is distinct from positive affect because of its future orientation.

### **Self-Efficacy: A Moderator for the BPS**

Although King found the BPS to be an effective method of improving health outcomes, there are some people for whom it may not be effective. This can be seen in people who do not have high levels of confidence in themselves. Self-efficacy is defined as a “belief in one’s capabilities to organize and execute the course of action required to produce given attainments” (Bandura, 1997, p. 3). Bandura’s theory of self-efficacy suggests that in order for self-efficacy to be considered high, an individual must believe that they have the capability of executing a positive outcome.

Bandura (1997) speaks about the major changes our society has witnessed by the shift from viewing physical health as a biomedical model with a heavy emphasis on “infection agents, ameliorative medications, and repair of physical impairments” (pg. 259) to a more generalized biopsychosocial model that emphasizes the impact mental health has within the parameters of physical health. The move from a disease oriented treatment model to a more holistic model has become predominant due to the recognition of people suffering and dying from impairments that could easily be prevented by themselves. Bandura (1997) explains that the poor nutritional habits (sedentary lifestyle, smoking, etc.) of individuals put them at risk for developing a variety of impairments such as cardiovascular disease, certain types of cancer, and respiratory disease (pg. 259-260).

In one study, 58 women who participated in an 8 week aerobic program were evaluated on various scales such as self-efficacy, post-program perceptions, and body weight which found

that those with high levels of self-efficacy were more likely to not drop out of the aerobic program, and those with low self-efficacy who stayed in the program were sporadic in their attendance and irregular with their healthy habits (McAuley & Jacobson, 1991). Those with high self-efficacy believed they were capable of completing the program, that they could motivate themselves to change their health habits and activities to promote better overall health.

Therefore, in regards to the current study, self-efficacy may act as a moderator for the BPS manipulation. Those with high levels of self-efficacy may see their BPS as unrealistic or unattainable, whereas those with high self-efficacy would see it as realistic and attainable. High self-efficacy is having confidence in one's ability to achieve the goals written about in the BPS writing exercise.

The current study serves as a replication of King (2001) with a modification of one of her control conditions, in which participants wrote about a traumatic life experience. The trauma condition did not increase positive affect, therefore the possibility of positive affect acting as a mediator of optimism can not be ruled out. For this reason, we are replacing the trauma condition with a "challenging event" condition. The writing prompt for this condition was drawn from McAdams' (2007) life story interview. Writing about a challenging event will likely lead to positive affect because it requires the participant to think about a difficult situation in their life that they have overcome. Focusing on the fact that they succeeding in overcoming a challenge and how they did so will provoke positive emotions. For four consecutive days, participants wrote either about their best possible self, a challenging event they experienced, or what they did or had planned to do that day. Participants completed measures of self-efficacy, optimism, and self-reported illness symptoms prior to starting the writing exercise. On the last day of writing, participants completed the measure of dispositional optimism, and once a week for four weeks

after, participants completed the self-report measure of illness symptoms and the measure of dispositional optimism.

Our hypotheses are as follows:

- 1. Participants in Best Possible Selves condition will show a significant increase in optimism and a decrease in illness. This decrease in illness will be greater than the decrease experienced by participants in the Challenging Event Condition.*
- 2. Participants in the Challenging Event condition will show a significant decrease in illness and this decrease will be less than the decrease experienced by participants in the BPS condition and above that experienced by the control condition.*
- 3. Optimism will interact with self-efficacy such that low self-efficacy subjects will show weaker effects of optimism when imagining themselves completing the BPS than high self-efficacy subjects.*
- 4. Participants in the Control Condition will experience neither an increase in optimism nor a decrease in illness.*

## **Method**

### **Participants**

The total number of participants who completed this study was 31. Their ages ranged from 18-23 years old. Out of 31 participants, 19% were male and 81% were female. Participants were largely Caucasian (77%), 6% were African American, 10% were African, and 6% classified themselves as other. Participants were obtained by email, word-of-mouth, by posting a sign up sheet in the psychology department at Hanover College. As an incentive for participating throughout the complete duration of the current study, Hanover College participants received extra credit in their psychology classes.

## Materials

All questionnaires and the writing exercises were distributed and completed online. To measure optimism, subjects completed the Revised Life Orientation Test (LOT-R) ( $\alpha=.75$ ) (Scheier, Carver, & Bridges, 1994). This measurement contained ten statements, which were rated on a four-point scale from *strongly disagree* to *strongly agree*. Statements in this measurement include, for example, “In uncertain times, I usually expect the best,” and, “I rarely count on good things happening to me”. The negatively worded items were reverse-scored (i.e. items 3, 7, and 9).

To measure self-efficacy, the Generalized Self-Efficacy Scale (GSES) was administered (Schwarzer & Jerusalem, 1995). There have been many studies dealing with identifying the importance of self-efficacy in relation to various factors, including physical health. Schwarzer and Jerusalem (1995) developed the Generalized Self-Efficacy Scale (GSES) which is based on Bandura’s theory and used to evaluate an individual’s self-efficacy. In a study conducted by Posadzki et al. (2010) to evaluate coherence, health behaviors, self-efficacy and optimism towards positive health attitudes, the GSES was used to signify the correlation between the GSES and optimism (Posadzki et al., 2010). The study found that self-efficacy had a significant effect on health behaviors. The study also found self-efficacy as a significant factor on depression and stress in college students. Statements included were, for example, “I can always manage to solve difficult problems if I try hard enough,” and, “It is easy for me to stick to my aims and accomplish my goals” (Schwarzer and Jerusalem, 1995). Each of the ten statements was rated on a four-point scale from *not true at all* to *exactly true*.

The Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1982; Pennebaker & Beall, 1986) was administered as a measurement of physical health. It includes 54 items of

physical complaints ( $\alpha = 0.91$ ) and its test-retest reliability range is from 0.79 to 0.83 (Pennebaker, 1982). Participants rated each item on a four-point scale for how often they experienced each symptom in the past week: 1 (never or almost never experienced symptom), 2 (experienced one or two times in the past week), 3 (experienced on the majority of days), 4 (every day). Examples of physical complaints are, “Congested nose,” “Feeling pressure in head,” and, “Sore throat.”

### **Procedure**

Before the study began, participants signed a consent form and completed the baseline LOT-R, Generalized Self-Efficacy Scale (GSES), and PILL questionnaires. Participants were randomly assigned to one of three conditions. They wrote about either their Best Possible Self, a Challenging Event, or the tasks they did that day for four consecutive days.

The writing prompt for the BPS condition was:

*Think about your life in the future. Imagine that everything has gone as well as it possibly could. You have worked hard and succeeded at accomplishing all of your life goals. Think of this as the realization of all of your life dreams. Now, write about what you imagined. (King, 2001)*

The first three days of writing prompts asked the participant to think about their life a certain amount of time into the future. The first prompt asked about their BPS one year after graduating college. The second asked about their BPS at midlife or around 40 years old, and the third asked about the BPS at late adulthood or approximately 70 years of age. The last writing prompt told them to think about the goals they had written for the first three days and if they wanted to add any goals or revise the ones they had declared, that they could do so on this day.

The writing prompt for the Challenging Event condition was:

*Looking back over your entire life, please identify and describe what you now consider to be the greatest single challenge you have faced in your life. What is or was the challenge or problem? How did the challenge or problem develop? How did you address or deal with this challenge or problem? What is the significance of this challenge or problem in your own life story? (McAdams, 2008)*

For the participants in the control condition, the following writing prompt, taken partially from King (2001) and adding our own words in order to keep participants from thoughts about emotion, was used:

*Write about what you did and plan to do later today. Go into as much detail about your activities as possible. Do not focus on your emotional experience, but rather the sequence of events. As you write, do not worry about punctuation and grammar.*

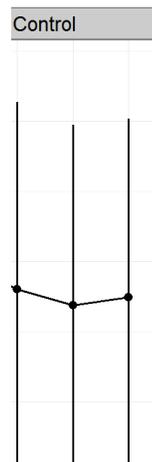
One week after completing the last writing assignment, participants completed the LOT-R, and every week for three weeks after, they completed the LOT-R and the PILL. E-mail was the main form of communication between the researchers and the participants. They were sent friendly reminders to complete writing assignments and questionnaires as necessary.

## **Results**

The purpose of this analysis was to evaluate the optimism, self-efficacy, and physical illness levels of subjects that wrote in one of three conditions: the Best Possible Selves (King, 2001), the Challenging Event (McAdams, 2007), or the control condition. We hypothesized that 1) participants in Best Possible Selves condition will show a significant increase in optimism and

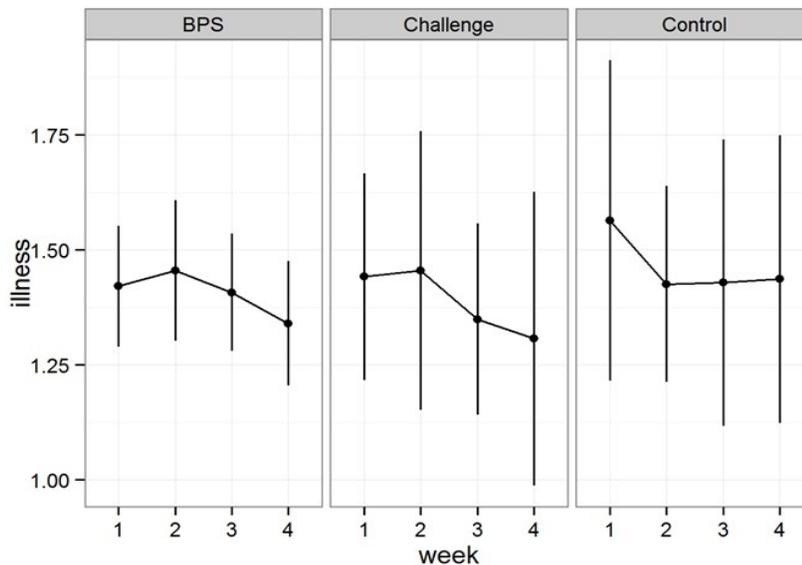
a decrease in illness. This decrease in illness will be greater than the decrease experienced by participants in the Challenging Event Condition, 2) participants in the Challenging Event condition will show a significant decrease in illness and this decrease will be less than the decrease experienced by participants in the BPS condition and above that experienced by the control condition, 3) optimism will interact with self-efficacy such that low self-efficacy subjects will show weaker effects of optimism when imagining themselves completing the BPS than high self-efficacy subjects, and 4) participants in the Control Condition will experience neither an increase in optimism nor a decrease in illness.

To test Hypothesis 1, we ran a 3 (condition: BPS, challenge, control) x 4 (time: week 1, 2, 3, and 4) mixed Analysis of Variance (ANOVA) with repeated measures on the second factor to look at optimism across time. See Figure 1 for results. The results are separated by condition (BPS, challenge, or control) and the x-axis represents the week number (1, 2, 3, or 4) and the y-axis represents the scale of scores from the LOT-R scale which were reported on a 1-4 Likert scale. We found no significant interaction ( $F(6,81)=1.51, p=.19$ ) between condition and week. This does support Hypothesis 4, but does not support Hypothesis 1.



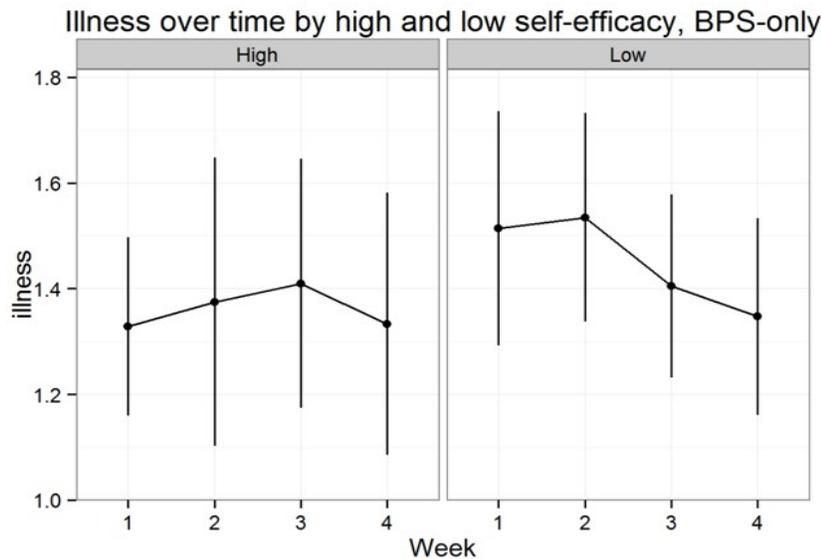
**Figure 1.** This graph shows the mean optimism scores across time and separated by condition. Number refers to week number.

To test Hypotheses 1 and 2, we ran a 3 (condition: BPS, challenge, control) x 4 (time: week 1, 2, 3, and 4) mixed Analysis of Variance (ANOVA) with repeated measures on the second factor to look at illness across time. See Figure 2 for results. The results are separated by condition (BPS, challenge, or control) and the x-axis represents the week number (1,2,3, or 4) and the y-axis represents the scale of scores from the PILL scale which were reported on a 1-4 Likert scale. We found a significant main effect ( $F(3,81)=3.05, p=0.03$ ) for time. Illness decreases across the weeks. We did not find a significant main effect for condition ( $F(2,27)=0.18, p=.83$ ) and most importantly no significant interaction ( $F(6,81)=.80, p=0.58$ ) between time and condition. Illness is decreasing across time, but it is not decreasing at a different rate for the different groups. We had expected illness to decrease more for the BPS group than the other two control groups. These results do support Hypothesis 4, but do not support Hypotheses 1 and 2.



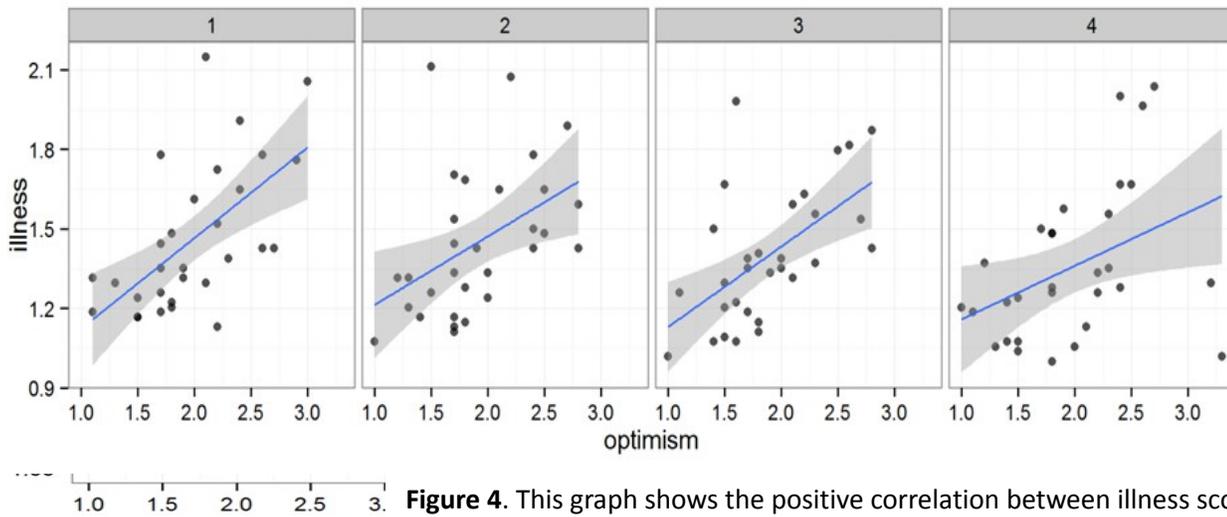
**Figure 2.** This graph shows mean illness scores across time and condition.

To test Hypothesis 3, a 4(time: weeks 1-4) by 2 (self-efficacy: low or high) mixed ANOVA with repeated measures on the first factor was run on just the BPS-group to look at the effects of the level of self-efficacy on illness. We expected high self-efficacy subjects to show a greater decrease in illness over time than low-self-efficacy subjects because they might take the BPS manipulation more seriously. They would see themselves capable of becoming their BPS. See Figure 3 for results. The main effect of self-efficacy was not significant ( $F(1,14)=0.63$ ,  $p=0.44$ ). The main effect of time is not significant ( $F(3,42)=1.65$ ,  $p=0.19$ ). The interaction between time and self-efficacy is also not significant ( $F(3,42)=1.70$ ,  $p=0.18$ ); therefore, the pattern for high-self-efficacy subjects is not different from the pattern for low-self-efficacy subjects. These results do not support Hypothesis 3.



**Figure 3.** This graph shows mean illness scores across time and separated by high and low self-efficacy scores. High self-efficacy was the top 50% of a median split from the BPS-group. Low self-efficacy was the bottom 50% of the median split from the BPS-group.

Because both optimism and illness showed a slight decrease over time, we ran a correlation between optimism and illness. See Figure 4 for results. The results are separated by week (1,2,3, or 4) and the x-axis represents the scale of scores from the LOT-R scale and the y-axis represents the scale of scores from the PILL scale which both were reported on a 1-4 Likert scale. The correlations for weeks 1 through 4 were  $r=0.61$ ,  $r=0.45$ ,  $r=0.57$ , and  $r=0.40$ , respectively. This comes to an average of  $r(120)=0.493$ ,  $p=.001$ . Figure 5 shows that this correlation is consistent across conditions. This positive correlation suggests that higher optimism scores tend to be found with more illness.



**Figure 4.** This graph shows the positive correlation between illness scores and optimism scores from all participants in all conditions separated by week. Each dot represents one

**Figure 5.** This graph shows the positive correlation between illness and optimism scores separated by condition. Each dot represents illness and optimism scores of one participant at one time, but each condition contains scores from all four weeks. n would

show a significant increase in optimism and a decrease in illness and 2) participants in the CE condition would show a significant decrease in illness. The data did support our fourth hypothesis, however, that 4) participants in the control condition would experience neither an increase in optimism nor a decrease in illness. It is true that the optimism and illness scores of participants in the control condition stayed statistically the same over the four weeks, but this

was also true of the two control conditions. Figures 1 and 2 show that there was no change in illness and optimism over time for any of the conditions.

Self-efficacy did not have any significance in the results of this study. It was hypothesized that 3) optimism would interact with self-efficacy such that those who scored high in self-efficacy would benefit the most from the BPS manipulation, that is show stronger effects of optimism on illness than low self-efficacy subjects. Our third hypothesis was not supported.

The positive correlation found between illness and optimism is inconsistent with previous research. King (2001) found a negative correlation between illness and optimism, that as optimism increased, illness decreased. As another example, Giltay et al. (2004), Giltay et al. (2006), and Tindle et al. (2009) found a negative correlation, that greater optimism was related with reduced risk of death from CVD. Other past studies cited in the introduction of this article resulted in negative correlations as well. Unexpectedly, the current study found that as optimism increases, physical illness increases. What is it about an increase in dispositional optimism that is associated with increased physical illness? Dispositional optimists have an expectation for positive outcomes in the future. Because optimists see a rosy future, they may fail to engage in preventative behavior or take appropriate precautions (Janoff-Bulman & Frieze, 1983, Perloff, 1983). When generalized to the topic of health, optimists may not take preventative measures to be healthy in the future. Perhaps they feel invulnerable to illness and think that it is not necessary to do anything to prevent illness. People who believe they are less susceptible to illness are less likely to comply with medical regimens (Becker, 1974, Haefner & Kirscht, 1970). For example, if a person believes it is not possible for them to acquire conjunctivitis, then they will be less likely to wash their hands after using the restroom, but in fact, by not washing their hands, they

are increasing their chances of getting conjunctivitis. The likelihood of taking preventative health measures could be a mediator between dispositional optimism and physical illness.

### **Limitations**

No significant decrease in reported illness or increase in optimism was found. This could be attributed to the little amount of time that illness was measured after the writing exercises. King (2001) found a decrease in health center visitation for BPS condition subjects after five months. Perhaps three weeks just is not enough time for the optimism manipulation to have its effect on illness. However, that would mean that the BPS manipulation did indeed cause an increase in optimism for those participants, and that is not what was found in this study. The limitation to the current study, therefore, lies within the effectiveness of the BPS manipulation on optimism.

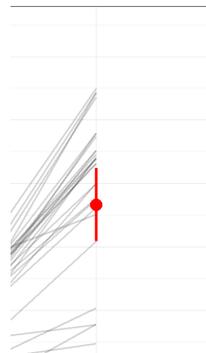
It is within the realm of possibility that one factor leading to a lack in effectiveness of the BPS writing exercise is that participants did not truly concentrate on their answers to the writing prompts. The quality of the writing responses to the BPS writing prompt in our study compared to King's (2001) are similar, but on the example King (2001) provides in the article, the number of words used was 390, whereas the average number of words used in the current study was 90. The average response in the current study is four times shorter than the response King (2001) provided. King (2001) conducted her study in the lab in which the writing exercises were handwritten, and participants were in the lab writing for 20 minutes. Meevissen et al. (2011) also had participants spend 20 minutes writing in the lab, but only for one day, rather than the four that King (2001) required. The current study was conducted through the internet with no time requirement. Maybe there is an effect of time spent on writing. Past research has shown that typing speed is significantly faster than handwriting speed and that in the same amount of time,

more words will be typed than written by hand (Horne et al., 2011). Because people spend more time writing by hand than typing, they are spending more time thinking about what they are writing. In the instance of King's (2001) study, participants spent more time thinking about their BPS or a challenging event than participants in our study because it takes longer to express a thought through writing by hand than by typing. Perhaps spending more time thinking about the future results in a greater effect of the BPS manipulation on optimism.

Another limitation is that the current study was conducted through the internet and participants could complete the writing exercises and questionnaires whenever and wherever they pleased. The environment in which the exercises were done was not controlled, and most importantly, neither was the amount of time spent writing. King (2001) controlled this environment and the amount of time by having participants come into the lab to complete each writing exercise and she found significant differences in optimism and illness between conditions. Perhaps the environment in which a study is conducted affects the experiment's strength of manipulation; an environment, in which writing exercises are done, promoting concentration, might create a stronger effect of the optimism manipulation. If this is true, then this could explain why no significant differences between the conditions of the current study were found. Concentration or focus was not measured, but perhaps the BPS manipulation would have been more effective if it was done in a thinking-friendly environment, like a classroom or lab.

Other limitations of this study include an unequal distribution of participants in the three conditions causing large error bars and a deviation from the intended schedule. Participants were randomly assigned to a condition by the computer upon signing into our website, so there was no way to control for this. Not all participants completed the writing exercises in four consecutive

days, and not all participants completed the questionnaires on the day we sent them a reminder email to do so. The schedule was given to the participants before they started the study, so this deviation from the schedule could simply be from forgetfulness or laziness on behalf of the participants. Figure 6 shows the inconsistency in responses from weeks 1 to 2, weeks 2 to 3, and weeks 3 to 4. Participants should have completed the first questionnaire at week 2 after 11 days from starting the first writing exercise, but the average number of days was 13. They should have completed the questionnaires at weeks 3 and 4 after 7 days since the previous questionnaire. The average number of days between questionnaires 1 and 2 was the targeted 7 days, but the number of days between questionnaires 2 to 3 was on average 13 days.



**Further Research** **Figure 6.** This graph shows the mean number of days between questionnaire responses across all conditions.

Further res: Each line represents one participant.

es compared to typing

responses on the computer. Is there something special in the mind that is provoked by handwriting one's thoughts, or is the only difference between the two the amount of time spent expressing one's thoughts? If there is something special going on in the cognitive processes of

one's mind, then that might explain why King (2001) found a significant difference between the BPS participants in optimism and illness compared to the control groups.

Another area for future research could be looking at data between different age groups. Do younger or older people have higher levels of optimism? Does that stage (young adult, middle aged, late life) in life affect how receptive the person would be to King's (2001) BPS writing exercises? A study done by Palgi et al. (2011) looks at the differences across age between participants' daily optimism and pessimism scores. This study found that younger participants (M=27) felt that the most emotionally beneficial combination was high daily optimism and low daily pessimism. This study also found that optimism and pessimism were not as strongly related to each other when looking at the elderly (M=72). These results show that there is a difference in how optimism is perceived in comparing different age groups and future research within this area would be beneficial to understand why these differences occur.

Further research could also look at the effects of the BPS writing prompt in a population of people who have a life threatening illness, are in recovery, or who have recovered. Do people who have survived a life threatening illness, like cancer or CVD, feel more optimistic because they survived a disease that had the potential to take their life? Do people who are currently fighting a life threatening illness feel more optimistic because they are currently fighting for their life? Henry et al. (2009) found that women who were breast cancer survivors living in rural and urban settings that partook in an in-home expressive-writing assignment were shown to have significant improvements in physical and psychological health three months prior to the assignment. Where this study did not show significant improvements long term and participants only completed the writing assignment once, having participants complete King's (2001) BPS

writing exercise for four consecutive days may show significant improvements long term in physical and psychological health.

Along with cancer patients and survivors, it would be interesting to look into populations of people that have cardiovascular disease. How do people with CVD rate the significance of their physical and psychological health in comparison with people who do not have CVD? Does optimism work differently for people with CVD? Boehm & Kubzansky (2012) found that positive psychological well-being consistently protects from cardiovascular disease when it is independent of traditional risk factors and ill-being, with an emphasis on optimism as being the most apparent measure of well-being shown to reduce the risk of cardiovascular events. This study shows that of all of the measures used to evaluate positive psychological well-being, optimism was the most robust. Future research would better clarify the effects of optimism within populations that have CVD when looking at what makes it unique compared to other factors.

### **Conclusion**

In summary, the attempt to use the BPS intervention was not effective in this study. The main reason for this could be that participants were not required to spend a certain amount of time writing about their BPS, whereas in previous studies, subjects were required to spend 20 minutes. Although no significant effects of the BPS intervention were found, a strong significant positive correlation was found between optimism and illness. It could be that people with high dispositional optimism take less preventative health measures because they do not believe they will get sick (Janoff-Bulman & Frieze, 1983, Perloff, 1983). Therefore, researchers wanting to increase a person's optimism may want to do so with caution, as there is a possibility that doing so would increase physical illness.



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