

Personality and Health Outcomes: Making Positive Expectations a Reality

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Abstract Trait optimism is associated with better health, but the reason for this association is unclear. The present investigation focused on specific goals and negative emotions as potential pathways through which optimism can lead to better health. College students ($n = 336$) in the U.S. reported their mental and physical health at the start of an academic term and during finals. Over the course of the term, they reported three daily events and rated the extent to which they were motivated to attain positive outcomes (approach goals) or avoid negative outcomes (avoidance goals). Greater optimism predicted fewer mental and physical health symptoms at the end of the term, controlling for initial symptoms. This association between optimism and symptoms was mediated by the intensity of avoidance goals and negative emotion during the term. These findings suggest that positive expectations do predict better health and this relationship is partially due to the goals people set in their daily lives.

Keywords Optimism · Goals · Self regulation · Health · Emotion

1 Introduction

The benefits of positive thinking have been discussed in recent decades by everyone from researchers to motivational speakers to medical doctors. The idea that positive thinking leads to improved health has been bolstered by findings that optimism, a trait characterized by positive future expectations, is associated with better mental and physical health (e.g., Peterson and Bossio 2001; Scheier et al. 1989). The advantages associated with positive expectations are especially evident in situations where people have already experienced a negative event and have little control, such as after receiving severe cancer diagnoses (Taylor and Brown 1988). Most situations, however, afford people some control over their fate before the event occurs and the way in which people construe the situation may have implications for their health. Understanding how optimistic people approach potentially

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negative situations in their daily lives could help elucidate the mechanisms that underlie the health benefits associated with optimism. The purpose of the present investigation was to determine if goals for specific daily situations can account for the relationship between trait optimism and better health.

1.1 The Benefits of Optimism

Many studies have demonstrated that being optimistic, defined as an individual difference characterized by positive future expectations, is related to health benefits. Optimism predicts better mental health and less emotional distress (e.g., Kwon 2002; Scheier et al. 1989). For instance, greater optimism predicted less postpartum depression, after controlling for initial depression (Scheier and Carver 1993). In another study, college freshmen were examined during the particularly stressful time of finals week (Brissette et al. 2002). Greater optimism, measured at the start of the term, predicted fewer psychological and physical symptoms after controlling for initial symptoms. Optimism has also been consistently related to better physical health (see Peterson and Bossio 2001 for a review). For example, Peterson and colleagues followed a group of participants for 50 years and found that people low in optimism died nearly 2 years before people high in optimism (Peterson et al. 1998).

The benefits associated with optimism stem, in part, from the coping strategies associated with optimism (e.g., Scheier and Carver 1993; Scheier et al. 1986). Nes and Segerstrom (2006) conducted a meta-analytic review to determine what types of coping are critical to explain the benefits of optimism. They found that greater optimism was associated with more approach-related coping strategies (e.g., taking direct action) and fewer avoidance-related coping strategies (e.g., avoiding the problem situation). These differences in coping partially mediate the relationship between optimism and mental and physical health benefits (Aspinwall and Taylor 1992; Brissette et al. 2002; Scheier and Carver 1993; Scheier et al. 1986). This research establishes that coping strategies after an event has occurred are important pathways through which optimism relates to health benefits.

Theoretical models suggest that, in addition to coping after an event, conceptualizations before and during events may also mediate the relation between optimism and health. For example, Aspinwall and Taylor (1997) outlined a temporal model that emphasized the importance of how people conceptualize a situation before and during its occurrence. They argue that this conceptualization has implications for how adeptly people react to stressors. The present investigation extends this theoretical framework to examine whether optimism predicts the goals people hold during daily events. Because daily events, rather than extreme or traumatic events, are the focus of this investigation, it has the potential to shed light on why optimism would predict health outcomes even in relatively young and healthy populations. Specifically, the present investigation focused on approach and avoidance goals held during a situation as a potential pathway through which individual differences in optimism can influence health.

1.2 Goals as Mediators of the Relationship between Optimism and Health

In their general model of self-regulation, Carver and Scheier (1990) propose that people continue to strive for goals that they view as attainable and experience more positive outcomes. When people view outcomes as unattainable, they disengage from the goal and experience more negative emotions. Thus trait optimism, defined by expectations for

positive outcomes, is particularly likely to relate to the goals that people hold in their daily lives. Two goals that motivate a wide range of behavior and emotion are the desire to approach positive outcomes (approach goals) and the desire to avoid negative outcomes (avoidance goals) (e.g., Gray 1972; Lang 1995). Whereas trait optimism is defined by general expectancies for positive outcomes, approach and avoidance goals are specific to a particular situation or potential outcome.

Most situations do not contain obvious potential rewards or punishments and thus people's goals are likely to be determined by the factors they attend to in situations (Damasio 1999). The expectation of positive outcomes associated with trait optimism is likely to direct attention to potential positive outcomes in any given situation (Isaacowitz 2005). Less optimistic people, who expect negative outcomes, are likely to direct attention to potential negative outcomes in any given situation. Supporting this association, in a Stroop paradigm, optimists' attention was drawn by positive information and the attention of people low in optimism was drawn by negative information (Segerstrom 2001). Due to the attention given to particular types of information, greater optimism was expected to predict fewer avoidance goals and more approach goals.

Avoidance goals, in particular, are associated with mental and physical health outcomes. Elliot and McGregor (2001) found that greater avoidance goals for an upcoming exam predicted more visits to health centers at the time of the examination. Students' goals, however, were assessed only 9 days before the exam and there was no assessment of their health at that time. It is therefore unclear whether avoidance goals were associated with worse health at both time points or predicted worsening health as the exam approached. The present investigation extends this research by examining goals as predictors of health symptoms several months later, controlling for initial symptoms. Avoidance goals were expected to predict worsening mental and physical health at the end of the semester. Further, less intense avoidance goals were expected to mediate the relationship between optimism and better mental and physical health.

If supported, the proposed mediational relationship has the potential to resolve a continuing debate about the relationship between optimism and health outcomes. The debate has centered on the possibility that general optimistic expectations may lead people to ignore risks, not pursue goals, or be emotionally devastated when an unexpected negative event does occur (Colvin and Block 1994; Janoff-Bulman and Frieze 1983; Perloff 1983; Tennen and Affleck 1987). If optimism predicts goals in specific situations, as anticipated in the present investigation, it resolves this debate because optimists would not just anticipate positive outcomes, but actively set goals that make those outcomes more likely to occur. The proposed mediation would also be consistent with evidence that optimists are more likely than less optimistic people to engage in practices that improve their health (Scheier et al. 1989; Aspinwall et al. 1991).

1.3 The Role of Negative Emotion

Negative emotion may be a critical part of the proposed mediational path from optimism to goals to health. Although positive emotion can help build resources to cope with stressful periods (e.g., Fredrickson 2001), negative emotions appear to be particularly deleterious for mental and physical health. Over time, negative emotion can lead to mental and physical health symptoms (e.g., Epel et al. 2004; Fredrickson and Losada 2005; Segerstrom et al. 1998). Reducing the intensity of negative emotions predicts fewer doctor visits, less self-reported pain, use of fewer medications, less depression, and better markers of immune functioning (see Pennebaker and Seagal 1999, for a review). Optimism is associated with

less intense negative emotion (Scheier and Carver 1993; Scheier et al. 1986) and avoidance goals are associated with more intense negative emotion (Lench and Levine in press; Norman and Aron 2003; Sherman et al. 1981). Thus, negative emotion was considered in the present investigation as a potential partial mediator between optimism and avoidance goals and subsequent mental and physical health symptoms. Mediation was not expected to be complete because optimism and avoidance goals include cognitive components that may have implications for health beyond their emotional consequences.

1.4 Overview of the Present Investigation

This study was designed to extend previous research on the relationships among optimism, goals, emotions and health. Although it has been proposed that specific goals may be important to an understanding of how optimism conveys health benefits (e.g., Snyder 2002; Tennen and Affleck 1987), there has been no investigation of the types of goals that may be relevant. The design of this investigation was similar to previous studies that assessed the association between optimism and health in college students (e.g., Aspinwall and Taylor 1992; Brissette et al. 2002). In these studies, students completed an initial session to assess optimism and mental and physical symptoms. Participants later completed an assessment of their mental and physical health symptoms during finals week. Predictions for the present investigation were as follows: (1) optimism was expected to predict fewer mental and physical health symptoms, (2) optimism was expected to predict less intense avoidance goals and avoidance goals were expected to mediate the relationship between optimism and health symptoms, (3) avoidance goals were expected to predict less intense negative emotions and negative emotions were expected to mediate the relationship between optimism and symptoms and avoidance goals and symptoms, (4) based on research demonstrating the link between mental health and the reporting of physical health symptoms, mental health symptoms were expected to mediate the impact of psychological factors on physical health symptoms.

2 Method

2.1 Participants

College students ($N = 336$) in the United States were recruited during their introduction to psychology course and received partial course credit for participation. Participants' average age was 19.3 years ($SD = 1.12$, range = 17–26 years) and 69% were female. Eleven participants (out of an initial 400) were excluded because they did not complete the majority of the initial measures. Participants were also excluded if they were missing data on the outcome variables of physical or mental health, for an included sample of 336 participants. Attrition over the course of the semester was not predicted by grade point average, initial physical health symptoms, positive emotions at three points during the semester, negative emotions at three points during the semester, approach goals over the semester, or avoidance goals over the semester, all $F_s < 1.20$. Participants who did not complete the survey were older ($M = 19.77$, $SD = 1.58$) than participants who completed the survey ($M = 19.22$, $SD = 0.99$), $t(391) = 3.64$, $p < .01$. There were also nonsignificant tendencies for participants who did not complete the survey to be less optimistic ($M = 3.15$, $SD = 0.64$) and have more mental health symptoms ($M = 1.76$, $SD = 0.69$) compared to the optimism ($M = 3.30$, $SD = 0.68$) and mental health symptoms

($M = 1.63$, $SD = 0.54$) of participants who completed all time points of the survey, $F(1, 390) = 2.68$, $p = .10$ and $F(1, 388) = 3.15$, $p = .08$, respectively.

2.2 Materials and Procedures

Participants were contacted for initial assessment during the first 2 weeks of their course and completed measures of optimism and initial physical and mental health symptoms. Three times during the term participants completed brief surveys describing a significant event during the day, and their goals and emotions during the event. For the final assessment, during finals week, participants completed a measure of their physical and mental health symptoms.

2.2.1 Initial Assessment

Shortly after beginning the term, students were invited to participate and received a link to the online survey.

Dispositional optimism was assessed by the Revised Life Orientation Test (LOT-R; Scheier et al. 1994). Participants answered six questions ($\alpha = .79$) about their future expectations (e.g., “I usually expect the best”) and four filler questions on a scale ranging from *strongly disagree* (0) to *strongly agree* (4).

The survey also assessed initial physical and mental health symptoms. Participants completed the Cohen-Hoberman Inventory of Physical Symptoms ($\alpha = .88$; CHIPS; Cohen and Hoberman 1983). On this measure, participants rated how often they were bothered or distressed in the past 2 weeks by 33 physical symptoms (e.g., headaches, congested nose, heart burn) on a scale ranging from *not at all* (0) to *extremely* (4). Self-report measures of health, especially those that focus on the frequency of symptoms or impairment, have been supported as reliable and valid (e.g., Idler et al. 1999). In addition, because all analyses control for initial physical symptoms to examine symptoms at the end of the term, stable individual differences that influence self-reports were unlikely to influence the relationships because they would presumably impact self-reports of health at both time points. To control for initial psychological symptoms, participants completed the Brief Symptom Inventory ($\alpha = .95$). This is a 53-item measure that lists psychological symptoms of nine common disorders (e.g., feelings of worthlessness, spells of terror or panic). Participants rated how much they were distressed by each symptom on a scale ranging from *not at all* (0) to *extremely* (4). Two of the standard subscales associated with this measure score symptoms of depression ($\alpha = .88$) and anxiety ($\alpha = .85$; reported analyses focus on the global measure described above).

2.2.2 Repeated Measure Assessment

Over the course of the term, participants were contacted three times at equal intervals to complete a survey about that day. Participants described one significant event from the day in a narrative format. They rated how happy, sad, angry, and anxious they were during the event on a scale ranging from *not at all* (1) to *extremely* (7) ($\alpha = .68$ to $.70$ across three time points). For this event, they rated the extent to which they were motivated by three approach goal statements (“I really wanted to achieve my goal”, “I thought I could make it happen”, “I kept trying to get it”) and three avoidance goal statements (e.g., “I wanted to avoid something negative”, “I thought something bad might happen”, “I wanted to run

away”), using a scale ranging from *not at all how I felt* (1) to *exactly how I felt* (9) (Lench and Levine 2008). The averages of these ratings were combined into an approach score ($\alpha = .82$ to $.87$ across three time points) and an avoidance score ($\alpha = .63$ to $.68$ across three time points).

Participants also reported how they coped with the three events reported over the academic term on the COPE (Carver 1997; Scheier et al. 1989). Participants rated how often they had been using coping strategies to deal with the event on a scale ranging from *I haven't been doing this at all* (1) to *I've been doing this a lot* (4). Eight coping subscales were created from these items (reappraisal, giving up, active coping, social support, turning to religion, acceptance, denial/avoidance, focus on emotions). These coping subscales were then combined to form measures of approach and avoidance coping strategies using the criteria established by Nes and Segerstrom (2006). It is important to note that, although these scales are also divided into approach and avoidance forms, the goal measure described above focuses on desires and thoughts regarding the potential outcome of the event whereas the coping measure focuses on ways to reduce emotional reactions after the event had occurred.

To rule out the possibility that optimism was related to the likelihood that participants would report successes or failures, the events participants described over the term were coded. Two independent raters, blind to the hypotheses and participants' reported goals, coded each event as representing a success or a failure. Successes were defined as events that resulted in the participant attaining something they desired or avoiding something that they did not desire. Failures were defined as events that resulted in participants failing to attain something they desired or experiencing something they did not desire. The raters reached acceptable agreement (Cohen's $\kappa = .86$) and discrepancies were resolved through discussion. Optimism was not related to whether participants reported successes or failures during the term, $r(334) = .09$, *ns*, and successes or failures are not discussed further.

2.2.3 Final Assessment

Participants were contacted during finals week to complete a brief assessment. Participants again completed the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS; Cohen and Hoberman 1983). To assess psychological symptoms, participants again completed the Brief Symptom Inventory.

3 Results

3.1 Preliminary Analyses

Descriptive statistics for the variables of interest are reported in Table 1. There was no significant skew and therefore data values were not transformed. As shown, participants were, on average, fairly optimistic and set both approach and avoidance goals during the academic term. On average, participants reported more positive emotions than negative emotions over the term, $t(335) = 10.19$, $p < .001$. For all participants, reports of initial physical and mental health symptoms were similar to symptoms reported at the end of the term, $t(335) = 1.94$, *ns* and $t(335) = .61$, *ns*, respectively.

Table 2 presents the correlations among variables. As shown, optimism was negatively correlated with avoidance goals, negative emotion, and symptoms and positively correlated with positive emotion. Approach and avoidance goals were moderately positively

Table 1 Descriptive statistics

Variable	<i>M</i>	SD
Optimism	3.30	.68
Approach goals	5.25	1.35
Avoidance goals	4.75	1.65
Positive emotion	3.57	1.33
Negative emotion	2.42	1.00
Initial physical health symptoms	1.54	.42
Final physical health symptoms	1.49	.44
Initial mental health symptoms	1.63	.53
Final mental health symptoms	1.61	.57

correlated, as is typically the case in goal research. Positive emotions were negatively correlated with negative emotion and symptoms and negative emotions were positively correlated with symptoms. Initial physical and mental health symptoms were positively correlated with one another and symptoms during finals week. Consistent with research on gender differences in self-reported symptoms, women, compared to men, reported more symptoms initially and during finals week. Therefore, subsequent analyses that examined predictors of mental and physical health symptoms during finals week included initial symptoms and gender.

3.2 Measurement Model

Although not the focus of this investigation, a measurement model was examined to determine whether the observed variables were reliable predictors of the latent constructs that were the focus of the investigation. Using AMOS version 16, each item of the respective scales was associated with the relevant latent construct and an error term was assigned to each item. Participants' mean on the respective scale was imputed for items with missing data values.

For ease of interpretation, the range is given for standardized estimates of items that represented each latent construct. For physical health symptoms, the standardized estimates for items ranged from .20 to .73 and all *p*-values were less than .02. For mental health symptoms, the standardized estimates of items ranged from .20 to .75 and all *p*-values were less than .005. Standardized estimates for approach goals ranged from .23 to .92 (*p*-values < .02) and estimates for avoidance goals ranged from .25 to .67 (*p*-values < .02). The standardized estimates for happiness ranged from .15 to .94 (*p*-values < .05) and for negative emotions the estimates ranged from .15 to .86 (*p*-values < .05). Standardized estimates for the construct optimism ranged from .32 to .80 and all *p*-values were less than .001. Thus the items included in the scales were reliable indicators of each of the latent constructs and a structural model could be examined.

3.3 Overview of Structural Models

Structural equation modeling was used to examine the proposed model with optimism, goals, emotions and health. A priori path analyses were tested using AMOS version 16 with maximum likelihood estimation. An initial model included all potential paths between the variables even if those paths were not expected to be significant. Optimism was

Table 2 Correlations among study variables

	1	2	3	4	5	6	7	8	9	10
1. Optimism	-	.07	-.20***	.14*	-.12*	-.26***	-.24***	-.47***	-.35***	-.07
2. Approach goals		-	.24***	.01	.26***	-.04	.03	-.01	.08	-.05
3. Avoidance goals			-	-.06	.29***	.06	.17**	.16**	.30***	.15**
4. Positive emotion				-	-.55***	-.12*	-.20***	-.22***	-.21***	-.11*
5. Negative emotion					-	.24***	.36***	.35***	.46***	.11*
6. Initial physical health symptoms						-	.42***	.65***	.42***	.19**
7. Final physical health symptoms							-	.44***	.72***	.24***
8. Initial mental health symptoms								-	.60***	.18**
9. Final mental health symptoms									-	.15**
10. Gender (1 = female)										-

* $p < .05$, ** $p < .01$, *** $p < .001$. Higher mental and physical symptom scores indicate worse health

included as a continuous direct predictor of symptoms and as an indirect predictor of symptoms through its relationship to approach goals, avoidance goals, and emotions. Approach and avoidance goals were included as predictors of positive and negative emotions as well as symptoms during finals week. Mental health symptoms during finals week were entered as a predictor of physical health symptoms during finals week, but it should be noted that these two measures were taken at the same point in time. As noted in the overview, this relationship was entered based on research demonstrating links between mental health and the reporting of physical health symptoms. Measures at Time 1 were allowed to correlate. A final theoretical model was developed that removed paths that were not expected to be significant when all variables were included. All models controlled for initial symptoms and gender.

Chi-square statistics are reported. The chi-square is likely to be significant due to sample size, however, in samples of more than 200 participants (e.g., Kline 1998). Several statistics that are less influenced by sample size are also reported, and consistency across these indices was used to examine the adequacy of models. The Bentler-Bonnett Comparative Fit Index (CFI) indicates the amount of improvement over a null independence model, with values greater than .90 indicating good fit. Values of the root-mean-square error of approximation (RMSEA) of .08 or under represent reasonable errors.

3.4 Structural Models

The initial model included optimism as a predictor of goals, emotions and mental and physical health symptoms and goals as predictors of emotions and mental and physical health symptoms. All paths among variables were included in the initial model even if they were not expected to be significant (e.g., the relationship between optimism and health outcomes was not expected to be significant after avoidance goals were taken into account, but this path was included in the initial model). Mental health symptoms were included as a predictor of physical health symptoms. As expected with the large sample size, the chi-square was significant, $\chi^2(20) = 61.83, p < .05$, and other indices indicated that the model was a fair fit, but could be improved ($CFI = .95; RMSEA = .09$). A final theoretical model was fit that removed non-significant paths and the removed paths were as follows (Standardized regression weights are reported for ease of interpretation). As expected when goals were entered as predictors, optimism was no longer significantly related to mental health during finals week, $b = -.08, ns$, or physical health symptoms during finals week, $b = .03, ns$. Optimism did not predict approach goals over the academic term, $b = .07, ns$ and approach goals did not predict health outcomes, $b = .01, ns$. Approach goals were therefore removed from the final model. Avoidance goals did not predict positive emotion after significant events during the term, $b = -.03, ns$. Being female versus male did not predict mental health symptoms during finals week, $b = .02, ns$, and positive emotion also did not predict mental health symptoms during finals week, $b = .06, ns$. As expected, physical health symptoms were not predicted by negative emotions, $b = .02, ns$, positive emotions, $b = -.02, ns$, or avoidance goals, $b = -.06, ns$, with mental health symptoms entered as a predictor. Optimism only marginally predicted negative emotion over the term, but this path was retained in the final model, $b = -.09, p = .09$.

The relationships among the latent variables included in the final theoretical model are shown in Fig. 1. Indices indicated that the model fit the observations with acceptable error ($CFI = .95; RMSEA = .07$), although the chi-square was significant, $\chi^2(27) = 72.86, p < .05$, likely due to sample size. The primary question was: what predicted physical and mental health symptoms during finals week? Consistent with hypotheses, optimism had

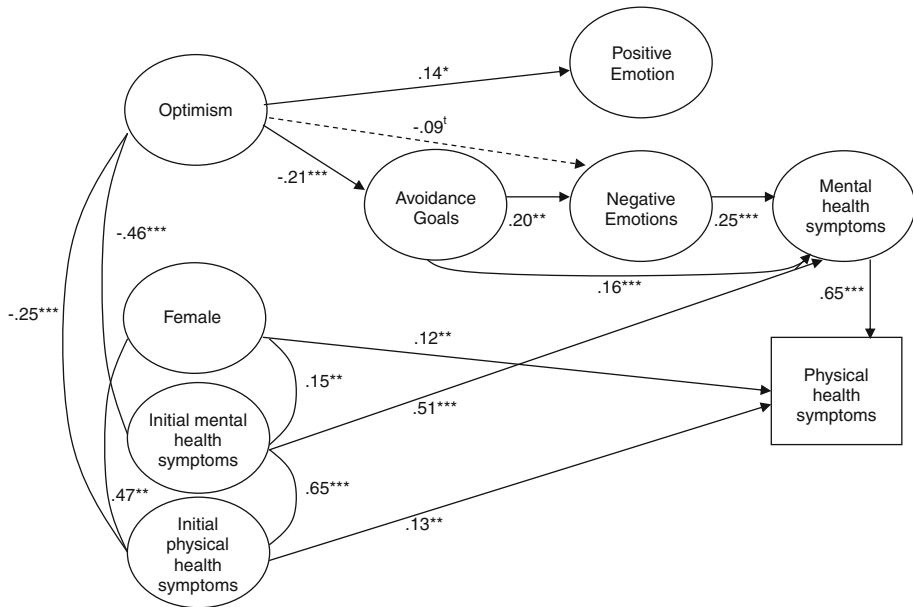


Fig. 1 Final structural equation model of the relationships among optimism, goals, emotions, and symptoms during finals week. Standardized coefficients are shown. $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

only an indirect effect on mental and physical health symptoms during finals week (see Fig. 1). The relationship between optimism and mental health symptoms during finals week was mediated by more optimistic participants setting fewer avoidance goals. Avoidance goals, in turn, had both a direct and indirect effect on mental health symptoms during finals week and an indirect effect on physical health symptoms. As predicted, the relationship between avoidance goals and mental health symptoms during finals week was partially mediated by the relationship between greater avoidance goals during the term and the experience of more intense negative emotion during the term. Avoidance goals directly predicted mental health symptoms in addition to its indirect effect on symptoms through negative emotions. Optimism, avoidance goals, and negative emotions only indirectly related to physical health symptoms. The only direct predictor of physical health symptoms during finals week, other than control variables, was mental health symptoms during finals week, although it should be noted that mental and physical health symptoms were measured at the same time point. Identical models were also examined for symptoms of anxiety and depression separately, as these are the two most common symptoms in college students, and the results were virtually identical to those reported for overall mental health symptoms.

3.5 Evaluation of Alternative Models

Greater optimism is associated with a tendency to cope using more approach strategies and fewer avoidance strategies (e.g., Nes and Segerstrom 2006). Alternative models, therefore, included approach and avoidance coping with daily events during the academic term. The

first model was identical to the final structural model reported above but additionally included approach coping and avoidance coping in the model predicted by optimism and as predictors of emotions and mental and physical health symptoms during finals week. This model did not provide an acceptable fit to the data, $\chi^2(40) = 535.87$, $p < .001$, $CFI = .66$; $RMSEA = .19$. In addition, optimism did not significantly predict approach and avoidance coping with specific events during the academic term, $b = .05$, $p = .40$ and $b = -.05$, $p = .36$, respectively. This finding contrasts with previous findings (see meta-analysis by Nes and Segerstrom 2006), but may be due to the fact that college students are a relatively healthy population who are not likely to be coping with significant health-related events.

An additional alternative model was fit to examine whether approach and avoidance coping were interchangeable with approach and avoidance goals. This model was identical to the final theoretical model but included approach and avoidance coping in the place of approach and avoidance goals. This model also did not provide an acceptable fit to the data, $\chi^2(23) = 423.16$, $p < .001$, $CFI = .70$; $RMSEA = .23$. Again, optimism did not predict approach and avoidance coping during the academic term, $b = .05$, $p = .40$ and $b = -.05$, $p = .36$, respectively.

4 Discussion

Trait optimism, characterized by expectations for positive outcomes, consistently predicts better mental and physical health in part due to the coping strategies employed after a negative event (Nes and Segerstrom 2006). The present investigation examined another potential pathway—that optimism may be associated with the goals people set during specific situations and that these goals mediate the relationship between optimism and health outcomes. Structural equation modeling included avoidance goals and negative emotions as mediators between optimism and mental and physical health symptoms. The results suggest that the goals people set in specific situations can predict their health and avoidance goals mediate the relationship between optimism and better health outcomes. Causality cannot be inferred from structural equation models, but the present investigation used a longitudinal design and controlled for initial health symptoms to predict health symptoms months later, suggesting that optimism and goals at the least predict health outcomes months later.

4.1 Not Focusing on the Negative

Importantly, the findings from the present investigation highlight that individual differences in optimism predict goals during daily events, not only coping after an event occurs. Optimists construed situations before and during important events in ways that reduced negative emotion and its impact on health. Taylor and Armor (1996) argued that optimism should predict goals to attain outcomes when the outcomes are controllable, distant, and ambiguous. The present findings suggest that optimism also predicts goals when the outcomes are significant events in daily life, which are likely to be controllable, proximal, and specific. Optimists were less likely to set avoidance goals. This result is consistent with findings that optimists avoid attending to negative information (e.g., Isaacowitz 2005; Segerstrom 2001). The early focus away from the potential negative consequences of a situation may allow optimists to recruit resources to attain positive outcomes because their cognitive and emotional resources are not being consumed by consideration of potential negative events. This possibility should be investigated in future investigations.

It has been suggested that the consequences of optimism and pessimism may be accounted for by their relation to neuroticism and negativity. There is some evidence in the present investigation that reduced negative emotions are critical to account for the health benefits associated with optimism. However, the association between optimism and negative emotions was mediated by the goals optimists set in daily life. Negativity and neuroticism could theoretically lead to a focus on negative outcomes and the setting of avoidance goals. Yet the reverse is not necessarily true. Theoretically, there is no reason for a *lack of* negativity or neuroticism to be associated with diverting attention from negative outcomes and setting avoidance goals (e.g., Baumeister et al. 2001). Thus it is likely that the association between optimism and fewer avoidance goals in daily life reflects a process associated with optimism above and beyond what could be accounted for by trait negativity or neuroticism.

Goals predicted mental and physical health symptoms in the present investigation. Students who reported setting more intense avoidance goals during the term reported worsening mental health and physical health at the end of the term. These analyses controlled for initial symptoms at the start of the term, so it was not the case that this finding was due to some students who consistently reported greater or lesser symptoms. Rather, these findings suggest that goals were related to changes in the number of health symptoms over an academic term. These results provide support for the proposition that the goals people set in specific situations matter for health (Tennen and Affleck 1987). More generally, these findings are consistent with recent findings that it is the way in which people interpret situations, not the objective stress of the situations, that influences health (e.g., Epel et al. 2004; Scheier et al. 1989).

One potential reason that optimism predicts better health and avoidance goals predict worsening health is that they relate to the emotions people experience during stress. Across a variety of tasks, avoidance goals have been consistently related to increased negative emotions during success and failure (Lench and Levine 2008; Norman and Aron 2003; Sherman et al. 1981). The present investigation suggests that this relationship has implications for the relationship between avoidance goals and health symptoms. Negative emotions mediated the relationship between optimism and health and goals and health. It should be noted that, even though negative emotions can influence reports of health at one time point, this relationship is based on a pattern of negative emotion experience over the course of an academic term to predict health outcomes at the end of the term. In addition, the longitudinal design controls for health reports at the start of the semester, making it unlikely that stable individual differences in negative emotion influenced the reported relationships. The positive emotions experienced by people with approach goals and often associated with optimism may also convey health benefits, although the effects were not apparent in the present investigation. For example, the positive emotions associated with approach goals may have an “undoing” effect on negative emotions, decreasing the damage associated with negative emotions and increasing resources to cope with stress (Fredrickson 2001). Approach goals may also be associated with more effective regulation of negative emotion in some situations, allowing for optimal functioning under stressful conditions.

4.2 Practical Implications, Limitations, and Future Directions

Recently, it has become something of a trend to instruct patients with mental or physical health problems to “think positively”. The implementation of this strategy was supported by findings linking optimism to health benefits. Unfortunately for patients, optimism is

described as an enduring trait, which is heritable and difficult to change (Scheier and Carver 1987). This fact may lead patients to experience positive thinking as uncomfortable or false because it does not fit with their natural tendencies. Further, encouraging positive thinking can put a burden on patients, making them feel responsible for negative health outcomes. If treatment is ineffective for a cancer patient, for example, they may blame themselves for not being positive enough or not smiling sufficiently (e.g., Bjerklie 2005).

The present findings suggest that simply thinking positively is not likely to lead to health benefits. Rather, not focusing on potential negative outcomes and setting goals to avoid those negative outcomes appears to predict health. This is a potentially important distinction because the types of goals people set are changeable (e.g., Lench and Levine 2008), whereas traits are difficult to change. Setting fewer avoidance goals is a matter of directing attention to the potential positive outcomes, rather than negative outcomes, in a given situation. For example, focusing on the potential benefits to be gained from taking a new medication rather than the potential negative side effects may be beneficial.

This investigation has several limitations that should be addressed in further research. First, college students tend to be a generally healthy population. Although trait optimism has been investigated as a predictor of health in college students previously, optimism may have stronger or more direct effects in a population that suffers from severe health problems. In addition, coping may relate to optimism and be an important predictor of health in populations that are currently coping with health-related issues and information. Further work will be needed to extend the present findings to community adults and adults with severe or chronic illnesses to determine if goals mediate the relationship between optimism and health in such situations. Second, all measures were self-report and collected over the internet. There may have been biases in reports or inconsistent environments during survey completion that influenced relationships. The present investigation attempted to reduce these potential biases by controlling for initial mental and physical health symptoms in all analyses and instructing participants to complete the survey in a quiet environment, but additional measures that do not rely on self-report should be included in future research. The reliability of the avoidance goal measure was also slightly less than the conventional cutoff (although better than the typical alpha associated with popular alternative scales; Carver and White 1994) and there was only a single item that measured positive emotion. Although consistent with emotion models that focus on specific emotions (e.g., happiness, sadness, anger, anxiety), these measurements could also be improved in future research. Third, prior research has demonstrated that approach and avoidance goals can be manipulated and that manipulated approach goals lead to performance and emotional benefits (Higgins et al. 1997; Lench and Levine 2008). The effects of goals on health could be more clearly delineated through research that directly manipulated goals.

5 Conclusions

The present findings add to a growing understanding of how stable individual differences can affect mental and physical health. Theoretically, these findings address a potential pathway through which optimism leads to better health. In addition, the results provide a framework for understanding health benefits through the goals that people set in specific situations. Practically, this investigation suggests ways to intervene in people's daily lives to encourage health. Holding positive expectations does not appear to be sufficient to improve health. Rather, people must direct attention and goals away from potential

negative outcomes in order to attain health benefits. To make positive expectations a reality, people must focus on what they have to gain rather than what they have to lose.

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