

# Longitudinal Effects of Hope on Depression and Anxiety: A Latent Variable Analysis

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**ABSTRACT** This study tested the prospective effects of hope on depression and anxiety using a longitudinal design. A sample of 522 college students completed self-report measures of hope, depression, and anxiety at three time points, with 1-month delays between administrations. Structural equation modeling was employed to test two cross-lagged panel models of the reciprocal effects of the Agency and Pathways components of hope on depression and anxiety. Results indicated statistically significant negative effects for the Agency component of hope on later depression but no unique effect of the Pathways component of hope on depression. Likewise, Agency showed a statistically significant negative effect on later anxiety, but again Pathways had no significant influence on anxiety. In both cases, neither depression nor anxiety demonstrated any longitudinal effects on either the Agency or Pathways components of hope. Implications of these findings are discussed, along with potential directions for future research.

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Seligman (1998) declared that positive emotions, largely neglected by the field of psychology, should be given greater emphasis and called for “massive research on human strength and virtue” (p. 29). As Seligman and Csikszentmihalyi (2000) pointed out, research suggests that certain human strengths such as courage, hope, and optimism, can act as buffers against psychological disorders (see also Peterson, 2000; Farran, Herth, & Popovich, 1995).

Hope is a particularly interesting attribute that can serve as a motivational factor to help initiate and sustain action toward goals and has also been linked to happiness, perseverance, achievement, and health (Peterson, 2000). An increasing number of empirical studies have found hope to be related to adjustment, both physical and psychological. For example, Snyder et al. (1991) found that college students high in hope utilized more active, approach-related coping strategies, even after controlling for negative affectivity. Similarly, Chang (1998) found that level of hopefulness in college students related negatively to wishful thinking, self-criticism, and social withdrawal. Furthermore, hope appears to be related to grade point average in college students and also to athletic performance in college athletes (Curry, Snyder, Cook, Ruby, & Rehm, 1997). In a study of veterans with visual impairment (Jackson, Taylor, Palmatier, Elliott, & Elliott, 1998), hope related positively with functional ability ( $r = .31$ ), sociable and confident coping styles ( $r_s = .43$  and  $.45$ , respectively) and negatively to the use of avoidant coping styles ( $r = -.46$ ). Hope has been found to be negatively related to general maladjustment (Cramer & Dyrkacz, 1998), suicidal ideation (Range & Penton, 1994), and symptoms of depression (Chang, 2003). The impact of hope on depression and psychosocial adjustment was also studied in a group of adults with traumatic spinal cord injuries. Higher hope was associated with less depression and greater overall psychosocial adjustment, even after controlling for the amount of time since injury (Elliott, Witty, Herrick, & Hoffman, 1991). Kwon (2000) also found that hope was negatively correlated with severity of depressive symptoms and that the relationship was moderated by mature defense styles.

Recently, Chang and DeSimone (2001) investigated the relationship between hope and depression in greater detail via a mediational path model. They found that level of hope had both direct and indirect effects on severity of depressive symptoms, as measured by the Beck Depression Inventory (Beck, Ward, Mendelson, Mock,

& Erbaugh, 1961). The indirect effects were mediated via hope's effect on coping style and secondary appraisals of control and effectiveness in relation to a recent psychology exam. Importantly, however, hope still had a statistically significant direct relationship with depression after the indirect effects were partialled out.

### HOPE THEORY

Early theories of hope conceptualized the construct as a unidimensional motivational force. For example, Stotland (1969) described hope as an "an expectation greater than zero of achieving a goal" (p. 2). More recently, Snyder (1994; see also Snyder, 2000; Snyder et al., 1991) developed a model of hope that built upon and expanded that of Stotland's definition. In addition to defining hope as the positive expectation of goal attainment, Snyder et al. expanded the definition of hope to include two interrelated cognitive dimensions: agency and pathways (Snyder, 1994; Snyder et al., 1991). *Agency* refers to the determination and commitment that helps one move in the direction of a goal, and is considered the driving force of hope. Agency is considered to be a cognitive set consisting of having both important goals and believing that one can initiate and sustain action toward goal attainment. *Pathways* refers to an individual's perceived ability to find one or more effective ways to reach his or her goals, as well as the perceived ability to formulate alternative plans when obstacles get in the way of goal attainment. Snyder noted that the two dimensions of hope commonly, but not always, co-occur, indicating that both Agency and Pathways are necessary for the operation of hope. Therefore, Snyder has proposed a multidimensional cognitive model of hope that moves away from the unidimensional conceptualization of hope as simply the expectation of goal attainment.

### AGENCY AND PATHWAYS AS UNIQUE COMPONENTS OF HOPE

As Snyder et al. (2002) reiterated, "hopeful thinking necessitates *both* the perceived capacity to envision workable routes *and* goal-directed thinking" (p. 258, emphasis in original). The theoretical assertion that both the Agency and Pathways components are essential to the operation of hope implies that Agency and Pathways should both make unique contributions to the prediction of relevant external

correlates. However, very few empirical studies have focused specifically on the unique contributions of the Agency and Pathways components. Cramer and Dyrkacz (1998) examined the correlations between the Agency and Pathways subscales and the clinical scales of the Minnesota Multiphasic Personality Inventory–II (MMPI-2). They computed a composite of the MMPI-2 clinical scales as an indicator of general maladjustment and found that it correlated more strongly with the Agency subscale ( $r = -.44$ ) than with the Pathways subscale ( $r = -.28$ ), a difference that was statistically significant. Thus, they demonstrated that the Agency subscale was a stronger predictor of psychological maladjustment than the Pathways subscale score. However, although these results are interesting in that they indicate a different pattern of correlations for the Agency and Pathways components, the analyses do not directly address the question of whether or not Agency and Pathways predict unique variance. Instead, the use of either partial correlation analyses or a hierarchical multiple regression would have more directly addressed the question.

In another study evaluating Agency and Pathways separately, the Agency subscale was found to be the strongest predictor of suicidal ideation in college students (see Range & Penton, 1994). However, again, a specific test of the unique variance accounted for by the Agency and Pathways components was not directly addressed. In the present study, the Agency and Pathways components of hope will be modeled as separate latent variables, and the simultaneous modeling of both components in a structural model (described in detail later) will directly test the unique contributions of both Agency and Pathways in predicting anxiety and depression. Thus, the present study will provide new information beyond simply analyzing differential patterns of correlations of the Agency and Pathways subscales in isolation.

### **COMPARING HOPE, OPTIMISM, AND SELF-EFFICACY**

The hope construct defined by Snyder (1994) bears obvious resemblances to both optimism and self-efficacy. Although the similarities and differences between the constructs have been discussed previously in detail (see Snyder, 2000; Snyder, Rand, & Sigmon, 2002), we briefly discuss the main points to clarify hope as a related, but

independent construct. Optimism is a general expectation that good things will happen (Carver & Scheier, 2002; Chang, 2001). Although both optimism and hope are associated with positive expectations, the positive expectations associated with hope are specifically oriented toward goal attainment and specifically focused on the perceived ability to sustain action towards goal attainment. Optimism, on the other hand, is a more general expectation of positive events, is not specifically focused on the individual as the initiator of such events, and is not specifically focused on particular actions that may bring about those positive events.

Self-efficacy is also a construct that is similar to, but also distinguishable from, hope. Self-efficacy (Bandura, 1986) is an individual's perception of his or her ability to "produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71). Importantly, self-efficacy is not characterized as an outcome expectancy, nor is it characterized as a personality trait (Maddux, 2002). Whereas hope is conceptualized as a relatively stable, cross-situational predisposition, self-efficacy is traditionally characterized as being specific to particular abilities in particular domains or circumstances. However, it should be noted that some researchers have developed measures of generalized self-efficacy (e.g., Tipton & Worthington, 1984).

### **THE PRESENT STUDY**

The results reported by Chang and DeSimone (2001) were based on cross-sectional data, and, as they noted, longitudinal studies are still needed in order to shed light on issues of causality. Therefore, the primary purpose of the present study was to examine the relationships between hope and depression using a longitudinal design. In addition, Chang and DeSimone noted that the relationships between hope and other negative mood states besides depression should be explored in further detail. Consistent with this recommendation, we also examined the relationship between hope and anxiety, also using a longitudinal design. Cross-lagged panel analysis designs were tested using structural equation modeling so that the effects of hope on both depression and anxiety, as well as the reciprocal effects of anxiety and depression on hope, could be examined, while also controlling for the temporal stability of the constructs. As discussed

previously, Snyder et al. (2002) clearly posited that the Agency and Pathways components are both required for the full activation of hope. Therefore, for the present study, the Agency and Pathways components of hope were modeled as two latent variables in order to directly test whether both of these aspects of hope have unique influences on anxiety or depression. If both Agency and Pathways components are found to make significant contributions to predicting depression and anxiety, this will provide evidence for Snyder's theory that both components are necessary.

## METHOD

### *Participants*

Participants included 522 undergraduate college students who participated for partial fulfillment of course requirements for introductory psychology. The sample was 39.0% men and 61.0% women. The ethnicity of participants was primarily Caucasian (83.9%), but also included some Hispanic (9.2%), African American (2.1%), Asian American (2.5%), and "other" (2.3%). Most of the participants were freshmen (52.1%) or sophomores (37.4%), with a mean age of 18.7 ( $SD = 0.86$ ). Ninety-one percent ( $N = 476$ ) of the participants completed the questionnaires at all three administrations. However, there were also some unanswered items, even for participants who completed all three time points. Listwise deletion was used for cases with missing item responses, which led to an effective sample size of 467 (89%) for the depression analyses and 438 (84%) for the anxiety analyses.

Analyses were conducted to evaluate possible differences between participants with and without missing data. To evaluate possible differences in sex and ethnicity, chi-square tests were performed, and for possible differences in age, depression, and anxiety, *t*-tests of group means were conducted. For both the depression analysis dataset and the anxiety analysis dataset there were no significant differences in age, sex, or ethnicity for participants with or without missing data. For the depression analysis, there was a trend toward higher panic-related anxiety (Depression, Anxiety, Stress Scales, Anxiety subscale) for those with missing data ( $M = 7.3$ ,  $SD = 8.7$ ) versus those without missing data ( $M = 4.9$ ,  $SD = 5.4$ ), but this difference was not statistically significant ( $p = .062$ , unequal group variance assumed). There were no differences in general worry and stress (DASS Stress Scale [Lovibond & Lovibond, 1995]). For the anxiety analysis, there was a trend toward more depression as measured

by the DASS Depression scale for participants with missing data ( $M = 7.6$ ,  $SD = 6.8$ ) versus those without missing data ( $M = 5.6$ ,  $SD = 6.8$ ), but this difference was not statistically significant ( $p = .06$ , unequal group variances assumed). Furthermore, there were no differences in depression as measured by the Beck Depression Inventory–II (Beck, Steer, & Brown, 1996) or the Center for Epidemiological Studies Depression Scale (Radloff, 1977). In summary, the only differences between participants with and without missing data were that those with missing data showed a trend toward being more anxious and depressed, but the degree of this difference was minimal and was not statistically significant.

### *Procedure*

After giving informed consent, participants completed measures of depression, anxiety, and hope, as part of a larger battery of questionnaires. The depression measures included the Beck Depression Inventory–II (BDI-II; Beck, Steer, & Brown, 1996), the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), and the Depression subscale from the Depression Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995). To measure anxiety, both the Anxiety and Stress subscales of the DASS were used. Hope was measured by the Snyder Hope Scale (SHS; Snyder et al., 1991).

The same battery of questionnaires was administered at three time points, with 1 month between administrations. To minimize attrition, participants were contacted via email to remind them of the date and time of the second and third administrations.

### *Measures*

*BDI-II.* The BDI-II (Beck et al., 1996) is a 21-item self-report measure of the severity of depressive symptomatology. Each item consists of four self-evaluative statements asking respondents to rate their symptoms from the last 2 weeks. The severity chosen could range from 0 to 4. The reliability and validity of BDI-II scores have been demonstrated in a number of studies described by Beck et al. (1996).

*CES-D.* The CES-D (Radloff, 1977) is a 20-item self-report measure of depression symptomatology. Items are rated on a 4-point Likert scale indicating the degree to which the respondent has experienced each symptom over the past 2 weeks. The CES-D has been shown to have good internal consistency with nonpatient ( $\alpha = .85$ ) and patient ( $\alpha = .90$ ) populations and test-retest reliability ranging from .45 to .70. It has been shown to have adequate discriminative and convergent validity (Radloff, 1977).

*DASS.* The DASS (Lovibond & Lovibond, 1995) is a 42-item self-report measure of depression and anxiety symptoms. The measure is composed of three subscales, one for depression and two for anxiety. One of the anxiety subscales, called Anxiety, taps cognitive and physiological symptoms of panic, whereas the other anxiety subscale, called Stress, measures symptoms of more general anxiety, including worry, irritability, tension, and inability to relax. The DASS was designed to allow maximum differentiation and minimal overlap of depression, generalized anxiety, and panic constructs.

*Snyder Hope Scale.* The Snyder Hope Scale (SHS; Snyder et al., 1991) is a 12-item self-report measure developed to assess the Agency (4 items) and Pathways (4-items) components of hope. It also contains 4 filler items. Respondents rate each item on the degree to which it is true or not true of them, using a 4-point Likert scale (0 = *Definitely False*, 3 = *Definitely True*). Items from both subscales can be summed to yield a total hope score.

Total SHS scores appear to be reasonably temporally stable, with retest correlations ranging from .85 over a 3-week retest period to .82 over a 10-week retest period (Snyder et al., 1991). In addition to the convergent correlations discussed previously, SHS scores have also been found to be correlated with measures of other theoretically related constructs, such as optimism ( $r = .50$ , Snyder et al., 1991; see also Cronister, 1998) and perceived problem-solving ability ( $r = .62$ ). Consistent with predictions from Snyder's hope theory, high hope people tend to have more goals, and more difficult goals, than do low hope people, and they also use more active and problem-solving coping strategies (Snyder et al., 1991).

Evidence for the two-dimensional nature of hope was reported by Snyder et al. (1991) who conducted a series of exploratory factor analyses (total  $N = 4,126$ ), and also by Babyak, Snyder, and Yoshinobu (1993) who reported a series of confirmatory factor analyses.

### *Statistical Analyses*

*Structural equation modeling.* A three-wave cross-lagged panel analysis was conducted using structural equation modeling to examine the reciprocal effects of both the Agency and Pathways components of hope on depression and vice versa. The model was estimated using LISREL 8.71 for Windows (Jöreskog & Sörbom, 1996, 2004). Note that the effects of hope on anxiety were also tested using a cross-lagged panel model but were estimated separately from the hope and depression model.

Several components of the model are worthy of note. First, there are three time points, and the effects of Agency and Pathways on depression



and the reciprocal effects of depression on Agency and Pathways are estimated. These aspects of the model are referred to as cross-lagged effects.

Second, the model also includes the influence of depression at one time point on depression at subsequent time points. The same is true for the influence of both components of hope at one time point on like components of hope at later time points. These aspects of the model, called autoregressive effects, can be thought of as indicators of the temporal stability of the latent constructs. Estimation of these parameters in the model control for the stability of the constructs; thus, any cross-lagged effects can be considered effects that add predictive power over and above that which can be obtained from simply the stability of the constructs.

Finally, note that Agency, Pathways, and depression are also all allowed to intercorrelate within each time point, represented by the curved, double-headed arrows. Estimating these “disturbances” in the model allows for correlations between variances in hope and depression that are not already explained by the influences of the latent variables of hope and/or depression from earlier time points.

*Model identification.* For the present study, the structural models were identified by fixing one pattern coefficient per latent factor to 1.00 (Byrne, 1998). In addition, to ensure the measurement of the latent constructs did not change over time, the pattern coefficients for any given indicator were constrained to be equal across all three time points.

Because the error variances for each of these indicators were expected to be similar at different time points, error variances of the indicators were allowed to correlate across time points. For example, the error variance for the BDI total score at Time 1 was allowed to correlate with the error variance for the BDI total score at Time 2, and Time 2 was allowed to correlate with Time 3, and these two error covariances were also constrained to be equal to one another. The error variance for Time 1 and Time 3 were also allowed to covary, but this covariance was not constrained to be equal to the Time 1–Time 2 and Time 2–Time 3 covariances, because the covariance is over a different time frame than the other two.

Finally, the degree of influence of Agency and Pathways on depression (as well as reciprocal effects) should be the same regardless of the time point. Therefore, the cross-lagged effects were constrained to be equal between time points. Likewise, the stability of the constructs theoretically should be the same across time, and so the autoregressive path coefficients were also constrained to be equal across time points.

*Assessment of model fit.* Most researchers advocate using multiple fit indices for evaluating model fit (e.g., Hoyle & Panter, 1995; Thompson &

Daniel, 1996). Currently, the most rigorous evaluation of fit criteria has been conducted by Hu and Bentler (1999). Therefore, for the current study, we followed the recommendations of Hu and Bentler, and evaluated model fit using a combination of the standardized root mean square residual (SRMR; expected to be .08 or less) and the comparative fit index (CFI; expected to be .95 or greater). Although the chi-square is sometimes regarded as problematic, given its sensitivity to sample size (Fan, Thompson, & Wang, 1999; Stevens, 1996), it was included in these analyses for the interested reader as it has traditionally been included in evaluations of structural models. However, for the present study, the value of the chi-square was *not* factored into an evaluation of the model fit. Given the skewness associated with measures of depression and anxiety, the Satorra-Bentler scaled chi-square and associated robust standard errors were used (see Satorra & Bentler, 1994).

In addition to assessing model fit, the ratios of the absolute values of the parameters to their respective standard errors were also inspected in order to determine statistical significance of the parameters. A ratio value of 2.0 is commonly accepted as noteworthy (see Marsh & Hocevar, 1985; Thompson & Borrello, 1992) and is also the value at which the parameter becomes statistically significant.

## RESULTS

### *Structural Model of Hope and Depression*

The total scores from the CESD, BDI, and the Depression subscale of the DASS were used as indicators of the latent depression variables. Individual items from the Agency and Pathways subscales of the SHS served as indicators of the Agency and Pathways latent variables. The structural model was estimated using the covariances of these indicators. The means and standard deviations of the indicators for both the depression and the anxiety structural models are presented in Table 1. Due to space considerations, the indicator correlation matrix is not presented here, but it is available from the primary author upon request.

The standardized parameter estimates for the structural model are presented as a structural diagram in Figure 1. In the measurement model, all of the parameter estimates for the loadings of the measured variables onto the latent variables were statistically significant. However, 8 of the 22 across-time error covariances were less than

**Table 1**  
Indicator Means and Standard Deviations for the Depression and Hope Model

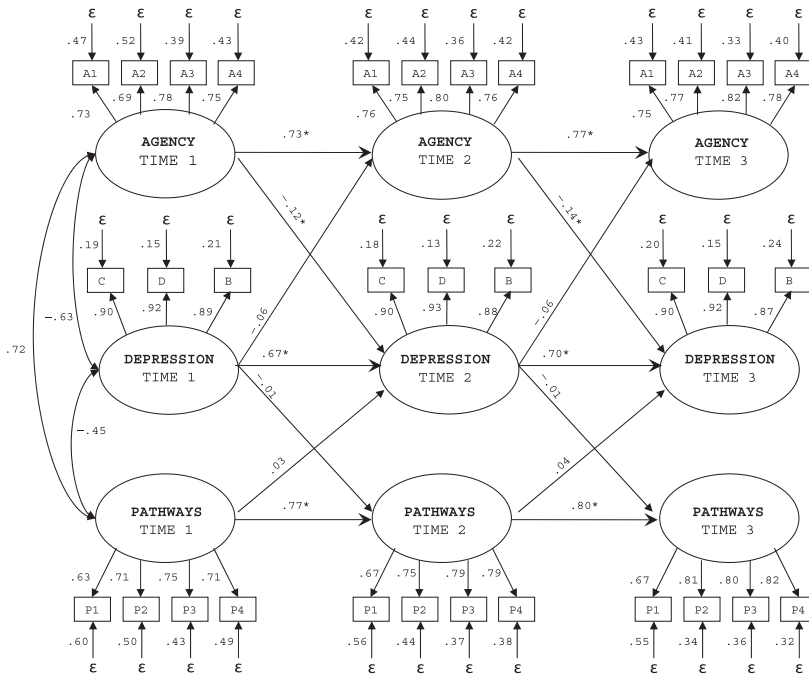
Indicator	Mean	SD
Hope1_1	2.19	0.67
Hope2_1	2.19	0.62
Hope3_1	2.24	0.66
Hope4_1	2.25	0.67
Hope5_1	2.07	0.69
Hope6_1	2.43	0.64
Hope7_1	2.44	0.59
Hope8_1	2.17	0.63
Hope1_2	2.25	0.66
Hope2_2	2.25	0.65
Hope3_2	2.35	0.67
Hope4_2	2.35	0.69
Hope5_2	2.18	0.70
Hope6_2	2.43	0.67
Hope7_2	2.45	0.64
Hope8_2	2.21	0.66
Hope1_3	2.33	0.73
Hope2_3	2.28	0.67
Hope3_3	2.40	0.64
Hope4_3	2.38	0.71
Hope5_3	2.27	0.66
Hope6_3	2.49	0.62
Hope7_3	2.45	0.60
Hope8_3	2.24	0.65
DASSDep_1	5.72	6.91
DASSDep_2	5.10	6.93
DASSDep_3	4.66	6.71
BDI_1	8.32	8.00
BDI_2	7.11	8.19
BDI_3	6.54	8.58
CESD_1	14.69	9.92
CESD_2	13.09	10.11
CESD_3	12.56	9.96
Anxiety1_1	2.21	2.79
Anxiety2_1	2.60	2.98
Anxiety1_2	1.80	2.80
Anxiety2_2	2.15	2.66

(Continued)

**Table 1. (Contd.)**

Indicator	Mean	SD
Anxiety1_3	1.59	2.67
Anxiety2_3	2.07	2.86
Stress_1	9.73	8.08
Stress_2	8.00	7.81
Stress_3	7.46	7.63

*Note.* Numeric suffixes prior to the underscore denote indicator number and numeric suffixes after the underscore denote time point. DASSDep = Depression subscale of the Depression Anxiety Stress Scales; BDI = Beck Depression Inventory-II; CESD = Center for Epidemiological Studies-Depression Scale.



**Figure 1**

Standardized structural model of Agency, Pathways, and depression. C = CESD total score, D = DASS Depression subscale score, B = BDI total Score, A = SHS Agency items, P = SHS Pathways items. Statistical significance is denoted only for the autoregressive and cross-lagged parameters. \* $p < .05$

twice their standard errors, meaning that these particular error terms did not correlate with each other to a statistically significant degree. Note that, for the sake of clarity, the across-time error covariances and the disturbance variances and covariances are not depicted in the structural diagram. However, they were estimated in the model as previously discussed and are available from the primary author upon request.

The Satorra-Bentler scaled chi-square statistic, with 473 degrees of freedom, was 972.13 ( $p < .01$ ). The CFI was .99, and the SRMR was .057. These fit statistics indicate that this model represents a very good representation of the data.

Several aspects of this model are noteworthy. First, all three of the latent variables, were moderately stable across the 1-month intervals, as evidenced by the large autoregressive effects for Depression (.67 and .70), Agency (.73 and .77), and Pathways (.77 and .80). There was also a cross-lagged effect of the Agency component of hope on depression, such that higher levels of Agency at one time point was related to a decreased level of depression at the subsequent time point. This is evidenced by the statistically significant parameters of  $-.12$  (Time 1 to Time 2) and  $-.14$  (Time 2 to Time 3) for the cross-lagged effects of Agency on depression. However, the cross-lagged effects of the Pathways component of hope on depression was not statistically significant. Likewise, the reciprocal effects of depression on the Pathways and Agency components of hope were close to zero and not statistically significant.

*Structural Model of Hope and Anxiety.* To test the longitudinal effects of Agency and Pathways on anxiety, another cross-lagged panel analysis with three time points was conducted. As in the previous analysis, individual items from the Agency and Pathways subscales of the SHS served as indicators of the Agency and Pathways latent variables. Scores from the Stress and Anxiety subscales of the DASS were used as indicators of the Anxiety latent variable. In order to have three indicators for the Anxiety latent variable, the Anxiety subscale items were divided randomly into two parcels, and the sum of these parcels served as two indicators. The sum of the DASS Anxiety subscale served as the third indicator. The structural model was estimated using the covariances of these indicators. As mentioned previously, the means and standard deviations of the indicators for both the depression and anxiety models appear in Table 1.

The correlation matrix for the indicators used in the anxiety analysis is available upon request from the primary author.

The standardized parameter estimates of the structural model are depicted as a structural diagram in Figure 2. Again, note that for the sake of clarity, the across-time error covariances and the disturbance variances and covariances are not depicted in the model presented in Figure 2, but they were estimated in the model and are available from the primary author.

In the measurement model, all of the parameter estimates for the loadings of the measured variables onto the latent variables were statistically significant. However, 10 of the 22 across-time error covariances were less than twice their standard errors, meaning that these particular error terms did not correlate with each other to a statistically significant degree. The Satorra-Bentler scaled chi-square

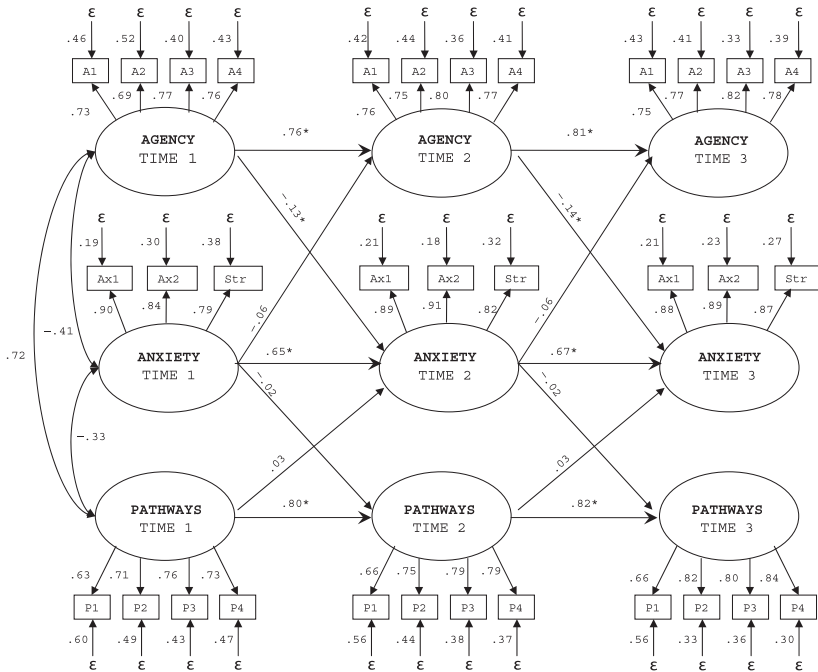


Figure 2

Standardized structural model of Agency, Pathways, and Anxiety. Ax1 = DASS Anxiety parcel 1, Ax2 = DASS Anxiety parcel 2, Str = DASS Stress subscale score, A = SHS Agency items, P = SHS Pathways items. Statistical significance is denoted only for the autoregressive and cross-lagged parameters. \* $p < .05$

statistic, with 473 degrees of freedom, was 927.14 ( $p < .01$ ). The CFI was .99, and the SRMR was .057. These fit statistics indicate that the model is a very good representation of the data.

As seen in Figure 2, anxiety, as well as both components of hope, were moderately stable over time, as evidenced by the parameter estimates for the autoregressive effects. The Agency component of hope had a noteworthy and statistically significant longitudinal effect on anxiety, such that higher levels of Agency at one time point were related to a decreased level of anxiety at the subsequent time point, as evidenced by the statistically significant cross-lag parameters of  $-.13$  (Time 1–Time 2) and  $-.14$  (Time 2–Time 3). However, the cross-lagged effects of the Pathways component of hope on anxiety were not statistically significant. Likewise, the reciprocal effects of anxiety on the Agency and Pathways components of hope were not statistically significant.

## DISCUSSION

The goal of the present study was to evaluate the longitudinal relationships between depression, anxiety, and the Agency and Pathways components of hope. According to Snyder et al. (1991), Agency and Pathways are two related yet separate components of hope, both of which are necessary for the beneficial activation of hopefulness. Therefore, in addition to evaluating the longitudinal relationships between hope, depression, and anxiety, the current study also represented a direct evaluation of the hope theory outlined by Snyder et al. (1991), in that the current study modeled the individual effects of the Agency and Pathways components.

Results of a three-wave, cross-lagged structural equation model demonstrated a small negative effect of hope on later depression, but this effect was accounted for by the Agency component of hope, with the Pathways component having no statistically significant effect on depression controlling for Agency. In addition, no reciprocal effects were found for the reverse direction. In other words, although higher levels of hope (or at least the Agency component of hope) predicted decreased levels of depression 1 month later, depression did not have any longitudinal effect on hope.

Similar results were found for a second structural model, evaluating the longitudinal effect of hope on anxiety. As was the case for

the depression analysis, Agency had a small, but noteworthy and statistically significant, negative effect on later levels of anxiety symptoms, controlling for Pathways, but Pathways had no significant effect on anxiety controlling for Agency. Furthermore, there were no reciprocal effects of anxiety on either Agency or Pathways. In other words, as was the case for depression, higher levels of the Agency component of hope at one time point were associated with lower levels of anxiety symptoms 1 month later, but anxiety symptoms did not have any effect on levels of hope.

These findings are interesting for a number of reasons. First, the findings provide further evidence for hope as a resiliency or protective factor, given that it was found to have at least a small effect of reducing the severity of depression symptoms one month later. Second, it is interesting, and perhaps encouraging, that severity of depression symptoms did not have any effect on future levels of hopefulness. This speaks, perhaps, to the resilience of hope itself, as a personality trait.

Finally, these results have implications for Snyder et al.'s (1991) hope theory. Although the theory posits that both Agency and Pathways are necessary for the activation of hope, only Agency demonstrated an independent, statistically significant effect on depression and anxiety. There are several possible reasons for these results. It could be the case that the Pathways component simply plays no role in the effect of hope on depression and anxiety but perhaps plays a role in the relationships between hope and other outcomes besides the ones evaluated in the current study. Another possibility is that both Agency and Pathways have noteworthy effects, but that they are both accounting for the same variance, rather than each making independent contributions to the relationship. Either one of these scenarios would lead to the results found in the current study, given that if Agency and Pathways are both accounting for the same variance in depression and anxiety, then one latent variable would arbitrarily receive "credit" for the effect with a statistically significant cross-lag parameter estimate in the structural model and the other receiving a statistically insignificant parameter (see Courville & Thompson, 2001; Thompson & Borrello, 1985). When this occurs, it is often due, at least in part, to the two variables being correlated, which is certainly the case for the SHS Agency and Pathways subscales in the current study ( $r = .59$ ) and other studies (for example,  $r = .69$ , Cramer & Dyrkacz, 1998;  $r$ 's = .39 to .57,



Snyder et al., 1991). However, even if this is the explanation for the lack of effect for Pathways in the current study, which would argue for the need to continue to include the Pathways component in the measurement of hope, it is still important to note that, contrary to Snyder et al.'s (1991) hope theory, Agency and Pathways do not necessarily make unique, independent contributions to the activation of hope, at least in longitudinally predicting anxiety and depression.

The fact that the longitudinal effects of hope on depression and anxiety found in the current study were small warrants further discussion. It should be noted that although these effects were small, they are noteworthy. These effects were not expected to be large for two reasons. First, depression was quite stable across the three time points. In other words, much of the variance in depression was already explained by the level of depression from previous, contiguous time points. Second, there are certainly a number of other variables that would be expected to have direct or moderating effects on depression that are not a focus of the current study. For example, the number of recent stressors, major life events, coping style, and social support could all have direct effects on depression. Given these reasons, the effect of hope on depression would not be expected to be large, and, therefore, it is noteworthy that a statistically significant effect was found, even though it was small. The same argument can be made regarding the small effect of hope on anxiety. Overall, these analyses provided further support for a positive relationship between hope and mental health.

As mentioned previously, the finding of a negative association between hope and depressive symptoms is not new. However, previous studies have utilized cross-sectional data, which have not allowed for conclusions about the direction of the relationships. Although the current study is still correlational and does not rule out other causal factors, the three-wave longitudinal design provides stronger evidence than previous studies for the potentially causal relationships between hope and severity of anxiety and depressive symptoms. Specifically, the current study provided evidence that higher levels of hope are associated with decreases in both anxiety and depressive symptoms, but that neither depression nor anxiety has a significant influence on hope. Although not conclusive, the current study points to the possibility that hope may have a causal influence on reducing symptoms of anxiety and depression.

*Study Limitations and Future Research*

The current study used a sample consisting only of college students, which limits generalizing our findings to other samples. Accordingly, an important focus of future research should be replication of the current study, utilizing more diverse community samples. The current study also utilized a relatively short time span of 2 months. Of course, such a time period is certainly worthy of study—and also conveniently covers two relatively stressful time periods for college students: the beginning of a new academic year and the period just before final exams. Nevertheless, it would be informative to study larger time periods also, such as over the span of a year or more, to determine if the same or perhaps even stronger relationships are found when larger periods of time are examined.

In addition, the current study was one of only a handful that has specifically evaluated the independent contributions of the Agency and Pathways components of hope. The value of future studies employing the SHS will be enhanced if researchers compare the predictive utility of the SHS total score with that of the Agency and Pathways as separate scores, such as via a hierarchical regression analysis. It may turn out to be the case that, for some outcomes, Agency and Pathways both account for unique variance, yielding a better predictive utility than the overall hope score, which would be consistent with Snyder et al.'s (1991) hope theory.

The current study represents a first step towards further explicating the relationship between hope, depression, and anxiety by utilizing a longitudinal study using latent variable modeling. An important next step will be to explore mediational mechanisms of this relationship. For example, as discussed previously, Chang and DeSimone (2001) found that the relationship between hope and dysphoria was partially mediated by hope's relationship with appraisals and coping styles. Those data, however, were cross-sectional, and so future research should further explore these and other potential mediators via longitudinal designs.

Another potentially fruitful area for future research would be to replicate the current study with a clinical sample, studying not only symptom severity, but also onset and remission of depressive and anxiety disorders, such as major depressive disorder, dysthymia, and panic disorder. At the other end of the spectrum, research addressing the influence of hope on positive emotions and well-being may also

prove to be fruitful. Indeed, as Peterson and Chang (2003) pointed out, for the field of positive psychology to move forward, researchers need to begin to evaluate outcomes that represent more than the absence or reduction of pathology. As Peterson and Chang put it, “It is not enough to study ‘positive’ predictors . . . one must also study ‘positive’ outcomes” (p. 68). Eventually, as the influences of hope on both negative and positive outcomes are better elucidated, such information should be useful for not only helping to alleviate psychological disorders but also helping people move beyond the simple absence of illness towards a state of flourishing (Peterson & Chang, 2003), or what Menninger (1963) referred to as “weller than well” (p. 406).

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