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# Hope as a Source of Resilience in Later Adulthood

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**Abstract:** This research provided a preliminary investigation of how variations in trait and state hope are associated with positive adaptation to stress in later adulthood. Trait hope and neuroticism were measured by questionnaires and state hope, stress, and negative emotions were assessed daily for 45 days. Results from multilevel random coefficient modeling analyses suggested that daily hope provides protective benefits by keeping negative emotions low, while also contributing to adaptive recovery from stress. The dynamic linkages between daily hope, stress, and emotion were further moderated by individual differences in trait hope. Compared with those low in trait hope, high-hope individuals showed diminished stress reactivity and more effective emotional recovery.

## 1. Introduction

Few things more poignantly reveal our remarkable capacity for resilience as our ability to sustain hope in the face of vulnerability, pain, and loss. As defined by Snyder and colleagues, "Hope is a

positive motivational state that is based on an interactively derived sense of successful *agency* (goal-directed energy) and *pathways* (planning to meet goals)" (Snyder, Irving, & Anderson, 1991, p. 287). Considerable empirical research suggests that hope is directly related to adjustment and well-being (Snyder, 2002). The manifold associations between hope and measures of psychological health have been documented across a wide variety of contexts, both in within-person (Snyder et al., 1996) and between-person analyses (Snyder, Harris, et al., 1991). The robustness of these associations has been demonstrated in both clinical and nonclinical samples of children and adolescents, as well as adults (for a review, see Edwards, Rand, Lopez, & Snyder, in press). The present study sought to extend the extant literature, while addressing four shortcomings in prior investigations.

First, although hope has been posited to play an important role in moderating stressful life events (Snyder, 2002), in many studies, particular life challenges (e.g., acute and chronic health conditions) are inferred to be stressful rather than directly assessed. Without empirical assessments of actual challenges experienced, it is difficult to map the diverse pathways through which positive adaptation to stress might occur (Chang & DeSimone, 2001). Second, studies to date have only examined concurrent temporal relationships between daily ratings of hope (Snyder et al., 1996). The presence of lagged relationships among the same variables separated in time would provide additional empirical support for the adaptational significance of daily hope processes. Third, surprisingly little is known about how hope shapes the unfolding experience of stress and emotion in later adulthood. The larger literature on adult resilience suggests that the everyday stressors that accumulate in late adulthood provide a compelling context in which to investigate positive outcomes in response to challenge (Ong & Bergeman, 2004). Studying naturally occurring stressors in later life may thus provide an opportunity to assess the prevalence of individuals who in fact demonstrate positive outcomes in the face of adversity. Finally, although considerable efforts have now focused on documenting the psychological sequelae of both between- and within-person differences in hope (Snyder, Hoza, Pelham, & Rapoff, 1997; Snyder et al., 1996), relatively less attention has been given to examining the potential interactive links between trait and state assessments of hope. Such assessments may shed light on the

unique ways in which individual and contextual factors are interrelated during times of stress (Fleeson, 2004).

The current study examines the question of how variations in trait and state hope modify the everyday experience of stress and emotion in later adulthood. Does the experience of hope function to interrupt negative emotional arousal following stress? Are high-hope individuals more adept at harnessing the adaptive benefits of hope during times of stress, intuitively using hope to their advantage? We examined these questions using a multilevel daily process design. Throughout, we predicted that variations in trait and state hope would afford adaptive benefits by protecting individuals from negative emotions, as well as speeding the recovery from such emotions.

## **2. Method**

Participants were randomly selected from a proband sample of 226 individuals who had previously participated in the *Notre Dame Family Study of Aging*. Forty-five participants were contacted and invited to participate in a study of daily stress and emotion. Twenty-seven participants, age 62–80 ( $M = 72.09$ ,  $SD = 5.29$ ), agreed to take part in the 45-day study. Participants were predominantly European–American (95.7%) and half (52%) were educated through high school. There were no significant differences in age, sex or educational status for those who did not complete the study. Participants received a \$5.00 gift certificate for each week of assessment completed, for a total of \$30.00.

### *2.1. Person-level measures*

#### *2.1.1. Trait hope*

Trait hope was assessed with the *Adult Trait Hope Scale* (Snyder, Harris, et al., 1991). The scale is comprised of eight items, with four items each assessing agency (e.g., “I energetically pursue my goals”) and pathways thinking (e.g. “There are lots of ways around any problem”). Items are rated on a four-point scale (from 1, *definitely false* to 4, *definitely true*). In the current study, the total hope score was used. Snyder, Harris, et al. (1991) reported coefficient alpha’s ranging from .74 to .84 for the total scale. For this sample, the coefficient alpha reliability was .76.

### 2.1.2. Neuroticism

Neuroticism was assessed using a 9-item short form of the Eysenck Personality Inventory (Eysenck & Eysenck, 1975). Sample items include "I am often anxious," and "I am extra sensitive sometimes." The scale score is based on the sum of yes and no responses to nine items. Coefficient alpha for this sample was .75.

## 2.2. Day-level measures

### 2.2.1. State hope

Daily levels of hope were measured in this study with the *State Hope Scale* (Snyder et al., 1996). The scale is comprised of six items, with three items each assessing agency (e.g., "At the present time, I am energetically pursuing my goals") and pathways thinking (e.g., "There are lots of ways around any problem that I am facing now"). Items are rated on a seven-point scale (from 1, *totally disagree* to 7, *totally agree*). Over all daily reports, moderately high intercorrelations were observed between agency and pathway scales ( $r = .54, p < .01$ ). In the present study, the total state hope score was used.

### 2.2.2. Negative mood

Daily negative emotions were measured using the *Positive and Negative Affect Schedule* (PANAS; Watson, Clark, & Tellegen, 1988). Participants were asked to indicate on a five-point scale (from 1, *very slightly or not at all*, to 5, *extremely*) the extent to which they had experience each of 10 negative emotion items during the day. The items included "afraid," "ashamed," "distressed," "guilty," "hostile," "irritable," "jittery," "nervous," "scared," and "upset." In addition to the original negative emotion PANAS items, which are generally high in arousal, we included four additional, low-arousal items from selected octants of the mood circumplex. The additional negative affect items included "depressed," "worried," "lonely," and "miserable."

### 2.2.3. Daily Stress

In addition to reporting on their daily hope and emotion, participants completed a single item on the most stressful event of the day and then rated their perceptions of how stressful the event was on a scale of 1 (very stressful) to 5 (not very stressful).

## 2.3. Procedure

Prior to the daily-assessment phase of the study, participants completed trait measures of hope and neuroticism. The daily data is from a 45-day study in which participants received a packet of diaries every two weeks. Each diary contained 14 days of response sheets. Each response sheet contained 14 emotion items traditionally assessed in dimensional measures of negative affect. In addition, participants completed a single item on the most stressful event of the day and then rated their perceptions of how stressful the event was. Participants were instructed to respond to the daily items in the evening and return the completed diaries at the end of each two-week period. The total number of days participants were in the study ranged from 35 to 42 ( $M = 37.4$ ,  $SD = 3.6$ ). The total number of days in the study for all participants was 1215 (27 participants  $\times$  45 days). The total number of days of data the participants provided was 1118 (92% complete).

## 3. Results

### 3.1. Descriptive findings

Preliminary analyses were conducted to obtain descriptive statistics and correlations among the person- and day-level variables. The daily variables were centered within each participant and aggregated across time. In comparison with daily stress ( $M = 1.41$ ,  $SD = .62$ ) and negative emotion ( $M = 1.35$ ,  $SD = .78$ ), daily hope scores were higher and more variable ( $M = 3.68$ ,  $SD = .91$ ). Overall, higher daily stress was associated with lower hope ( $r = -.42$ ,  $p < .05$ ) and higher negative emotion ( $r = .44$ ,  $p < .05$ ). Trait hope, moreover, was significantly correlated with daily hope ( $r = .56$ ,  $p < .01$ ), stress ( $r = -.39$ ,  $p < .05$ ), and neuroticism ( $r = -.43$ ,  $p < .05$ ), but was unrelated to daily negative emotion ( $r = -.15$ , ns).

### 3.2. Overview of multilevel level modeling analyses

We tested our hypotheses using multilevel random coefficient modeling (MRCM) using the program HLM (Raudenbush, Bryk, Cheong, & Congdon, 2004; Version 6). The basic daylevel (within-person or level 1) model is as follows:

$$y_{ij} = \beta_{0j} + r_{ij}$$

In this model,  $\beta_{0j}$  is a random coefficient representing the mean of  $y$  (daily negative emotion) for person  $j$  (across the  $i$  days for which each person provided data),  $r_{ij}$  represents the error associated with each measure of negative emotion, and the variance of  $r_{ij}$  constitutes the daylevel residual (or error) variance. The basic person-level (between-person or level 2) model is as follows:

$$\beta_{0j} = y_{00} + u_{0j}$$

In this model,  $y_{00}$  represents the grand mean of the person-level means ( $\beta_{0j}$ s) from the day-level model;  $u_{0j}$  represents the error of  $\beta_{0j}$ , and the variance of  $u_{0j}$  constitutes the personlevel residual variance.

The first set of analyses examined the reliability of the day-level measure of negative emotion and other daily measures. Following recommendations by Raudenbush and Bryk (2002), all day-level variables were centered on individuals' means, and all person-level variables were centered on sample means. This analysis estimated the mean level of daily negative emotion to be 1.35. The estimated within-person variance of daily negative emotion (the variance of  $r_{ij}$ ) was .58, and the estimated between-person variance (the variance of  $u_{0j}$ ) was 1.12. The estimated with-in-person reliability (defined as the ratio of true to total variance) of daily negative emotion was .97. These data, thus, indicated that the daily ratings of negative emotion were reliable and that there was sufficient variability at the day level to allow for the possibility of modeling with-in-person relationships. The reliability estimates for daily hope and stress were examined with a similar set of procedures and are presented in Table 1.

### *3.3. Moderating relationships between stress, hope, and negative emotions*

To test the hypothesis that daily hope moderates the effects of stress, the following daylevel model was analyzed:

$$y_{ij} = \beta_{0j} + \beta_{1j}(\text{Stress}) + \beta_{2j}(\text{Hope}) + \beta_{3j}(\text{Stress} \times \text{Hope}) + r_{ij}$$

In this model,  $\beta_{0j}$  is a random coefficient representing the intercept of  $y$  (daily negative emotion) for person  $j$  (across the  $i$  days for which each person provided data);  $\beta_{1j}$  (Stress) is a random coefficient, a slope, representing the day-level (within-person) relationship between stress and negative emotion for person  $j$ ;  $\beta_{2j}$  (Hope) represents the relationship between hope and negative emotion,  $\beta_{3j}$  (Stress  $\times$  Hope) is the concurrent interaction between stress and hope, and  $r_i$  represents error.<sup>1</sup>

To examine whether day-level relationships were significantly different from 0 across the individuals in the study, the following person-level model was examined:

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + u_{0j}, \\ \beta_{1j} &= \gamma_{10} + u_{1j}, \\ \beta_{2j} &= \gamma_{20} + u_{2j}, \\ \beta_{3j} &= \gamma_{30} + u_{3j}.\end{aligned}$$

In this model, the significance of  $\gamma_{10}$  indicated if, on average, the within-person relationship between stress and negative emotion differed from zero; the significance of  $\gamma_{20}$  indicated if, on average, the within-person relationship between hope and negative emotion differed from zero; and the significance of  $\gamma_{30}$  indicated if, on average, the within-person interaction between stress and hope differed from zero.

Across all participants, daily negative emotion scores tended to be higher on days when stress was higher ( $\gamma_{10} = .381$ ,  $t = 6.21$ ,  $p < .001$ ). This within-person coefficient is functionally equivalent to an unstandardized regression coefficient and can be interpreted as such. Thus, for every unit increase in daily stress, mean daily negative emotion increased .38 units. The strength of this relationship was examined by comparing random parameter estimates, and strength was operationalized as the between-person variance in daily negative emotion accounted for by stress (for a discussion, see Bryk & Raudenbush, 1992, p. 65). Examination of the random parameter estimates indicated that inclusion of daily stress resulted in an 18% reduction of within-person variance in negative emotion. This corresponds to a correlation of .42 (the square root of .18) between daily stress and negative emotion. As predicted, higher levels of hope

interacted with stress to weaken its influence on negative emotion ( $\gamma_{30} = -.328, t = -4.97, p < .001$ ), a finding that is consistent with research suggesting that hope buffers the effects of stress (Snyder, 2002).

### *3.4. Mediating relationships between daily stress, hope, and negative emotions*

We also tested the hypothesis that daily hope would mediate the effects of stress recovery. To analyze mediated relationships, lagged associations between daily stress and emotion were examined. These analyses required that data be provided on consecutive days. Of the total 1043 days recorded in the study, 935 had data recorded for the days immediately preceding them and were included in the analyses. To rule out the possibility that any lagged effect of stress on negative emotion might be an artifact of initial level of negative emotion, baseline negative emotion was included in the model as a control variable. In such a model, the dependent variable can be interpreted as the residual change in negative emotion scores from day  $t$  to day  $t + 1$  (Kessler & Greenberg, 1981).<sup>2</sup> The analysis model for changes in daily negative emotion for each individual can be expressed as follows:

$$\Delta\gamma_{t+1} = \beta_{0j} + \beta_{1j}(\text{NEG}_t) + \beta_{2j}(\text{Stresst}) + \beta_{3j}(\text{Hope}_t) + r_{t+1}$$

where  $\Delta\gamma_{t+1}$  is the change in negative emotion scores between day  $t$  and day  $t + 1$ ;  $\beta_{0j}$  is a random regression intercept for person  $j$ .  $\beta_{1j}$  is a random coefficient representing an individual's level of negative emotion on day  $t$  (with the grand mean across all person-days subtracted);  $\beta_{2j} - \beta_{3j}$  represent the within-person associations of stress and hope on next day's negative emotion; and  $r_{t+1}$  is a residual component of change in negative emotion.

In order to test the hypothesis that daily hope mediates stress recovery, we used a *product of coefficients* test recently described by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002). This test assesses the indirect effect of a mediating variable as the product of two regression coefficients, one linking the explanatory variable and the mediator and the other linking the mediator and the dependent

variable. The significance of this cross-product is divided by its standard error and tested for significance using a specialized sampling distribution. If the inclusion of daily hope ( $\beta_{3j}$ ) renders the slope between stress and next day's negative emotion ( $\beta_{2j}$ ) nonsignificant (when it was significant in an analysis without  $\beta_{3j}$ ), then it can be concluded that daily hope mediates the relationship between stress and next day's negative emotion. Our analyses revealed that when daily hope was included in the analysis of emotional recovery, the relationship between stress and next day's negative emotion was reduced to nonsignificance (.12), whereas it was significant in an analysis without hope (.34). A significant Sobel (1982) test indicated the drop in the value of the betas was significant ( $z = 3.36, p < .01$ ), providing evidence for mediation. To the extent that such results can be used as a basis for making inferences about directionality of effects, it would appear that changes in emotional recovery from stress are due to changes in daily hope. More specifically, part of the impact that stress may have on negative emotional recovery may be due to decreases in hope brought about by stress. The presence of daily hope, in contrast, functions to speed recovery from stress.

### *3.5. Individual differences in within-person relationships*

An important focus of research on day-to-day covariation between psychological states and daily mood is the extent to which within-person relationships vary as a function of trait differences (Fleeson, 2004). Although relationships between traits may parallel relationships between the same constructs measured as states, trait and state covariation may also measure the operation of qualitatively distinct processes (Tennen, Affleck, Armeli, & Carney, 2000). To determine if day-level relationships between stress and emotion varied as a function of personlevel variables (i.e., trait hope), coefficients from the previously described day-level models were analyzed at the person level using the following models:

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}(\text{Trait Hope}) + u_{0j}, \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}(\text{Trait Hope}) + u_{1j}, \\ \beta_{2j} &= \gamma_{20} + \gamma_{21}(\text{Trait Hope}) + u_{2j},\end{aligned}$$

$$\beta_{3j} = \gamma_{30} + \gamma_{31}(\text{Trait Hope}) + u_{3j}.$$

In these models, each person's day-level slopes are predicted by an intercept, trait hope, and a random error component.<sup>3</sup> For example,  $\gamma_{10}$  can be interpreted as the predicted value of the stress–negative emotion association at average levels of trait hope;  $\gamma_{11}$  can be interpreted as the partial relationship between trait hope and the stress–negative emotion relationship. In addition, given that trait hope was negatively correlated with neuroticism in the current data, any observed associations with daily stress and emotion may be due to this shared neuroticism component rather than any actual adaptive benefits of trait hope. Thus, we also examined the extent to which the correlations between trait hope and daily stress and emotion exist independently of their mutual associations with neuroticism. Table 2 shows the relationships between trait hope and stress and emotion, with and without controlling for neuroticism. Although the coefficients for trait hope, stress, and daily hope, and their interactions were smaller than they were in an analysis without neuroticism, Table 2 shows that all coefficients maintained their valence and remained statistically significant after neuroticism was controlled.

The results indicated that trait hope moderated the relationship between daily stress and negative emotion ( $\gamma_{11} = -.262, t = -3.84, p < .001$ ). In addition, the individual slopes relating daily hope to negative emotion on days of above average stress were also predictable from trait hope ( $\gamma_{31} = -.227, t = -2.91, p < .01$ ). A test of planned contrast (see Bryk & Raudenbush, 1992, pp. 48–56) revealed that this relationship differed significantly across high (–.33) and low (–.12) stress days,  $\chi^2(1) = 8.12, p < .01$ . Finally, a similar set of analyses examining individual differences in the strength of lagged coefficients found one significant moderating relationship. More specifically, the effect of stress on next day's negative emotion was found to be stronger for individuals chronically low in trait hope ( $\gamma_{31} = -.234, t = -3.17, p < .01$ ).

## 4. Discussion

The results confirmed the primary hypotheses of the study. At both the within- and between-person levels, hope was associated with positive adaptation to stress. At the within person level, the experience

of daily hope served to moderate stress reactivity and mediate stress recovery. At the between-person level, low-hope individuals reported higher levels of daily stress. Noteworthy was the interaction between trait hope and daily stress. The slope defining the stress–negative emotion association was steeper among persons habitually low in hope than those high on the trait. This finding is consistent with prior studies that suggest compared with those low in trait hope, high-hope individuals are, in general, less reactive to stressful situations (Chang & DeSimone, 2001; Snyder, 2002). Of particular importance was the presence of cross-level interactions between trait and state variables: There was a significant interaction between trait hope and day-level slopes predicting negative emotion, such that the stress-dampening impact of daily hope on negative emotion was most pronounced among highhope individuals. Taken together, the results suggest that it is the dynamic interplay between trait and state processes (Fleeson, 2004) that provides substantive insight into the role of hope in adaptation to daily stress.

An important analytic feature of the current study was the introduction of tests of lagged and cross-lagged relationships. The larger literature on stress and resilience suggest that highresilient individuals may recovery more quickly from stress (Curtis & Cicchetti, 2003). Using MRCM, we tested the lagged effects of trait and state hope on emotional recovery from stress. The results of these analyses revealed a cascade of reciprocal relationships between hope, stress, and emotion. Tellingly, these relations were not limited to concurrent (same-day) effects, but extended to influence each other as much as 24 hours later. Specifically, among individuals low in trait hope, the unpleasant experience of one daily stressful event tends to follow on the heels of another, thereby ratcheting up subsequent levels of stress and negative emotion even higher. Conversely, those high in trait hope showed a greater capacity to minimize the detrimental impact of stress on subsequent negative emotion. These findings lend support to the hypothesis that the experience of daily hope exerts continual influence on health and wellbeing over time (Snyder et al., 1996).

Several limitations of this research deserve comment. First, a number of variables known to have an effect on the stress process were not examined in the current research. In particular, we did not attempt to measure variation in life events (Affleck, Tennen, Urrows, &

Higgins, 1994) or social networks (Uchino, Holt Lunstad, Uno, & Flinders, 2001) as possible predictors of either reactivity or recovery from daily stressful events. Thus, it will be important for future studies to determine the unique ways in which hope interacts with interpersonal and situational factors to influence adaptation to stress. Second, the data for this study is correlational in nature and cannot demonstrate causality (Rogosa, 1979). Determining the causal relationships between hope and adaptation to stress clearly requires more research. Finally, our analyses of daily hope, stress, and emotion relied heavily on retrospective reports from respondents. All daily entries were end-of-day assessments and may have been affected by retrospection. Because participants were instructed to complete the daily diaries each evening, the data do not control for possible time-of-day mood effects associated with personality (Rusting & Larsen, 1998).

In spite of these limitations, the results of the current study represent a first step toward articulating how individual differences in hope are reflected in daily life and ultimately influence the well-being of older adults. Results from this study suggest that hope is an important source of resilience in later adulthood: Both within and across individuals, hope appears to shape the meaning of daily stressors in ways that reduce their intensity and hinder their proliferation. When viewed together, the trait–state representations of hope in the current study lend further support to the notion of *multifinality* (see Cicchetti & Rogosch, 1996), which emphasizes that individual and contextually determined factors can unfold and coalesce into series and patterns of experiences that can evolve and change in highly contingent ways. We think this complex interplay is one of the most promising areas for future study.

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## **Notes**

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- <sup>1</sup>Because the associations between variables of interest may reflect the influence of linear trends, we included day of study as a control variable in all analyses.
- <sup>2</sup>We also explored whether nonstationarity accounted for some of the lagged effects by conducting regressions of residualized variables in the time series. We note that all coefficients maintained their valence and remained statistically significant when residualized scores were included as control variables.
- <sup>3</sup>Throughout this investigation, age was assessed in the same multilevel models as trait hope. We did not, however, find any significant variation across people in the size of the primary slope coefficients as a function of age.

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## Appendix

**Table 1. Descriptive statistics and correlations among study variables**

Variable	M	SD	Reliability	1	2	3	4	5
1. Daily negative emotion	1.35	.78	.97	1.00				
2. Daily stress	1.41	.62	.84	.44 <sup>a</sup>	1.00			
3. Daily hope	3.68	.91	.92	-.26	-.42 <sup>a</sup>	1.00		
4. Trait hope	23.18	2.73	.76	-.15	-.39 <sup>a</sup>	.56 <sup>b</sup>	1.00	
5. Neuroticism	12.29	2.14	.75	.49 <sup>b</sup>	.42 <sup>a</sup>	-.23	.43 <sup>a</sup>	1.00

Note.  $N = 27$  for person-level correlations. Significance tests for the number of participants were used instead of the number of observations to adjust for within-subject dependency.

<sup>a</sup> $p < .05$ .

<sup>b</sup> $p < .01$ .

**Table 2. Parameter estimates for daily negative emotions, with and without controlling for Neuroticism**

	Coefficient	t(df)	p level
<i>Without neuroticism</i>			
Trait hope	-.127	-.89 (22)	ns
Stress	.381	6.21 (925)	.001
Hope	-.092	-.81 (925)	ns
Stress × Hope	-.328	-4.97 (925)	.001
Stress × Trait hope	-.278	-3.95 (925)	.001
Hope × Trait hope	-.052	-.69 (925)	ns
Stress × Hope × Trait hope	-.248	-3.14 (925)	.01
<i>With neuroticism</i>			
Trait hope	-.104	-.81 (22)	ns
Stress	.314	4.81 (925)	.001
Hope	-.071	-.73 (925)	ns
Stress × Hope	-.285	-4.36 (925)	.001
Stress × Trait hope	-.262	-3.84 (925)	.001
Hope × Trait hope	-.041	-.46 (925)	ns
Stress × Hope × Trait hope	-.227	-2.91 (925)	.01

Note. All day-level predictors were group-mean centered, and all person-level predictors were centered on sample means.

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