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## Relationship of resilience to personality, coping, and psychiatric symptoms in young adults

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### Abstract

Developing a comprehensive understanding of resilience across the lifespan is potentially important for mental health promotion, yet resilience has been vastly understudied compared to disease and vulnerability. The present study investigated the relationship of resilience to personality traits, coping styles, and psychiatric symptoms in a sample of college students. Measures included the Connor–Davidson Resilience Scale, NEO Five Factor Inventory, Coping Inventory for Stressful Situations, and Brief Symptom Inventory. Results supported hypotheses regarding the relationship of resilience to personality dimensions and coping styles. Resilience was negatively associated with neuroticism, and positively related to extraversion and conscientiousness. Coping styles also predicted variance in resilience above and beyond the contributions of these personality traits. Task-oriented coping was positively related to resilience, and mediated the relationship between conscientiousness and resilience. Emotion-oriented coping was associated with low resilience. Finally, resilience was shown to moderate the relationship between a form of childhood maltreatment (emotional neglect) and current psychiatric symptoms. These results augment the literature that seeks to better define resilience and provide evidence for the construct validity of the Connor–Davidson Resilience Scale.

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*Keywords:* Resilience (psychological); Stress reactions; Emotional trauma; Five-factor personality model; Coping behavior; College students

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## Introduction

“*Resilience and protective factors* are the positive counterparts to both vulnerability, which denotes an individual’s susceptibility to a disorder, and risk factors, which are biological or psychological hazards that increase the likelihood of a negative developmental outcome in a group of people.” (Werner & Smith, 1992, p. 3).

Developmental psychologists have long been interested in the construct of resilience, which has been broadly defined as “a dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma” (Luthar & Cicchetti, 2000, p. 858). Resilience is often conceptualized as existing along a continuum with vulnerability and implies a resistance to psychopathology, though not total invulnerability to the development of psychiatric disorder (Ingram & Price, 2001). Early theories of resilience emphasized identification of child characteristics associated with positive outcomes in the face of adversity (Rutter, 1985; Werner, 1984). This line of research later expanded to include external protective factors that may promote resilience, such as effective schools and relationships with supportive adults (Luthar, Cicchetti, & Becker, 2000). Current theories view resilience as a multidimensional construct, which includes constitutional variables like temperament and personality, in addition to specific skills (e.g. active problem-solving) that allow individuals to cope well with traumatic life events.

Though the first wave of resilience research focused on characteristics of resilient individuals, a second wave of research in this area has focused more on understanding the process through which individuals are able to successfully adapt, or “bounce back” from stress or trauma. Resilience is seen as more than simple recovery from insult (Bonanno, 2004), rather it can be defined as positive growth or adaptation following periods of homeostatic disruption (Richardson, 2002). Although positive adaptation in response to extreme adversity was originally thought to characterize extraordinary individuals, more recent research suggests that resilience is relatively common among children and adolescents exposed to disadvantage, trauma, and adversity (Masten, 2001). The majority of resilience research has been conducted with these younger populations, and little is known about how resilience operates in adulthood.

This gap in the resilience literature is particularly troubling, since we know that despite high levels of exposure to potentially-traumatic events during their lifetimes (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) most adults do not go on to develop severe distress or psychopathology. Bonanno (2004) argues that because most research into trauma and loss has only included treatment-seeking populations, we continue to know very little about the process of resilient adaptation in adulthood. He suggests that in adults resilience should be conceptualized as the ability to maintain relatively healthy and stable levels of physical and psychological functioning in the wake of traumatic experiences. Though there is little research in this area, Bonanno proposes that several different paths may lead to resilience in adulthood, and that resilient adaptation may be far more common than previously believed.

Work like Bonanno’s (2004) calls attention to the fact that although resilience has been studied extensively by developmental researchers, it has received little attention in the psychiatry and psychopathology literature due to a longstanding focus on disease and pathology. However, many authors have advocated a new approach to psychopathology research that includes a focus on positive adaptation in response to stress. For example, a developmental psychopathology perspective emphasizes the need to study the mechanisms and processes that lead to positive

adaptation along with those leading to pathology in order to enhance our understanding of both normal and abnormal development (Cicchetti & Cohen, 1995). Developmental psychopathologists advocate an integrated multidisciplinary approach to assessment, diagnosis, and intervention that places equal emphasis on competencies and protective factors.

Similarly, proponents of the positive psychology movement advocate a broader view of human experience that includes an understanding of individual strengths, talents, and virtues. Seligman and Csikszentmihalyi (2000) argue that in the last several decades the field of psychology has focused almost exclusively on understanding human functioning within a disease-focused medical model. Although psychologists have made great strides in understanding the biological, social, and environmental processes and contexts for pathology, many other human experiences have been neglected. In contrast, positive psychology encourages application of the scientific method to the full complexity of human behavior, including positive adaptation and growth. This approach is consistent with what has been termed the postmodern or new-science perspective, which also recommends a shift away from problem-oriented approaches to those focusing on strengths that allow individuals to survive and grow even in the face of adversity (Richardson, 2002).

Only recently have clinical researchers taken up the call to engage in research to understand positive adaptation despite adversity. For example, Charney (2004) has developed a model of the psychobiological systems implicated in resilient adaptation following acute stress. Building on previous models of the neural underpinnings of reward, motivation, fear conditioning, and social behavior, he proposes an integrative model of resilience and vulnerability that incorporates several brain regions and a number of neurochemical, neuropeptide, and hormonal mediators of the acute stress response. This type of theoretical model may help to balance the overwhelming focus on stress-related psychopathology that has thus far characterized this research domain. Tsuang (2000) has also suggested that research into the factors that promote resilience may have important clinical implications, particularly for preventive interventions. He notes that future molecular genetic studies may help to uncover the mechanisms underlying resilience, which could inform both psychological and pharmacological treatments.

As psychopathology researchers and clinicians become more interested in assessing resilience and understanding how it operates in the promotion and maintenance of mental health there is an increasing need for high quality measures of the construct. However, to date there are few well-validated measures of resilience for use with adult populations. To address this issue Connor and Davidson (2003) developed a new self-report instrument, the Connor–Davidson Resilience Scale (CD-RISC). This measure was designed with the dual goals of establishing norms for resilience in normal and clinical samples and of assessing the extent to which resilience scores change in response to treatment. The CD-RISC is made up of items reflecting several aspects of resilience including a sense of personal competence, tolerance of negative affect, positive acceptance of change, trust in one's instincts, sense of social support, spiritual faith, and an action-oriented approach to problem solving. Initial work suggests that the CD-RISC is a promising measure for use with adult psychiatric and normal populations (Connor & Davidson, 2003; Connor, Davidson, & Lee, 2003). Efforts to strengthen the psychometric properties of the CD-RISC may help this instrument to become the "gold standard" self-report measure for assessing resilience in adult populations. The existence of a well-validated resilience scale may also encourage researchers and clinicians to include this important construct in their assessment batteries along with more traditional measures of psychiatric morbidity.

The present study sought to enhance understanding of the relationship of resilience in young adulthood to personality traits, coping styles, and psychiatric symptoms. First, we predicted that resilience would demonstrate meaningful relationships to Costa and McCrae's (1992) five-factor model personality constructs. We hypothesized that resilience would have a strong negative relationship with neuroticism, as this trait captures vulnerability to negative emotions and has been shown to relate strongly to anxiety and depression (Bienvenu & Stein, 2003; Brown, Chorpita, & Barlow, 1998; Costa & McCrae, 1992). In contrast, we predicted that resilience would have a strong positive relationship with extraversion, because extraverted people tend to experience more positive emotions, form attachments to others easily, and seek out social interaction (Costa & McCrae, 1992). Both positive emotions and social support have been linked to resilience (Bonanno, 2004; Luthar et al., 2000; Tugade & Fredrickson, 2004). In addition, we predicted that resilience would have a moderately positive relationship to conscientiousness, mainly because highly conscientious persons would be more likely to have strong self-efficacy and would take an active problem-solving approach to dealing with stress. Task-oriented coping has been shown to be a generally adaptive manner of dealing with stress, particularly when the stressor is controllable (Penley, Tomaka, & Wiebe, 2002; Zeidner & Saklofske, 1996).

Resilience and coping are related constructs, but coping refers to the set of cognitive and behavioral strategies used by an individual to manage the demands of stressful situations (Folkman & Moskowitz, 2004), whereas resilience refers to adaptive outcomes in the face of adversity. We predicted that in addition to broad personality traits, coping styles would contribute to resilience. Because coping theorists generally emphasize the positive impact of task-oriented coping and negative impact of emotion-oriented coping on adaptive outcomes (Zeidner & Saklofske, 1996), we predicted that task-oriented coping would be positively related to resilience and emotion-oriented coping would be negatively related to resilience.

A secondary purpose of the study was to investigate the construct validity of the CD-RISC and to evaluate its suitability as a broad measure of resilience in adulthood. Testing the relationships of the CD-RISC to personality and coping measures would help to establish the convergent and discriminant validity of the CD-RISC. However, we also felt that it was important that this measure capture the "essence" of resilience; namely, the capacity to rebound from stress effectively and to attain good functioning despite adversity. Therefore, we tested the moderating effects of resilience on the relationship between childhood maltreatment and later psychiatric symptoms. We predicted that resilience (as measured by the CD-RISC) would moderate the relationship between retrospective reports of childhood trauma and current psychiatric symptoms. Individuals endorsing relatively high levels of childhood trauma and low levels of resilience were expected to manifest high levels of current psychiatric symptoms. In contrast, individuals reporting high levels of childhood trauma in combination with high resilience were expected to manifest low levels of current psychiatric symptoms.

## Method

### *Participants*

Participants were 132 undergraduates from San Diego State University (SDSU) who elected to complete studies for course credit in Fall 2003 and Spring 2004. These studies were approved by

the Institutional Review Boards at SDSU and University of California, San Diego. Females comprised the majority of the sample (72.0%), and the mean age was 18.87 years ( $SD = 1.55$ ). Participants self-identified as Caucasian (60.6%), Hispanic (11.4%), Filipino (10.6%), Asian American (12.1%), African American (0.8%), and Mixed Ethnicity/Other (4.5%).

### Measures

*Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003)*: The CD-RISC is a 25-item scale that measures the ability to cope with stress and adversity. Items include: “I am able to adapt when changes occur,” “I tend to bounce back after illness, injury, or other hardships,” and “I am able to handle unpleasant or painful feelings like sadness, fear, and anger.” Respondents rate items on a scale from 0 (“not true at all”) to 4 (“true nearly all the time”). A preliminary study of the psychometric properties of the CD-RISC in general population and patient samples showed it to have adequate internal consistency, test-retest reliability, and convergent and divergent validity (Connor & Davidson, 2003). An exploratory factor analysis suggested that the CD-RISC might be multidimensional, with factors corresponding to personal competence/tenacity, trust in one’s instincts/tolerance of negative affect, positive acceptance of change/secure relationships, control, and spirituality. Although this multidimensional structure was found, the reliability and validity of the subscales has not been established and the authors use only the total score in data analyses (Connor & Davidson, 2003). Therefore, only CD-RISC total scores were used in this study.

*NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992)*: The NEO-FFI is a 60-item self-report measure of the “big five” dimensions of personality. It consists of five 12-item scales measuring neuroticism, extraversion, openness, agreeableness, and conscientiousness. Respondents rate each item on a five-point scale from “strongly disagree” to “strongly agree.” The NEO-FFI has been used extensively in psychology research and has demonstrated good internal consistency, test-retest reliability, and validity (Costa & McCrae, 1992).

*Coping Inventory for Stressful Situations: Short Form (CISS-SF; Endler & Parker, 1999)*: The CISS-SF is a 21-item self-report measure that measures task-oriented (e.g. “Focus on the problem and see how I can solve it”), emotion-oriented (e.g. “Blame myself for being too emotional about the situation”), and avoidance-oriented (e.g. “Take time off and get away from the situation”) coping. Respondents rate the extent to which they engage in various activities when confronted with a difficult, stressful, or upsetting situation using a five-point scale ranging from “Not at All” to “Very Much.” The CISS-SF has shown good internal consistency for the task-oriented, emotion-oriented, and avoidance-oriented subscales. The factor structure of the CISS-SF is comparable to that of the original instrument (Cohan, Jang, & Stein, *in press*).

*Childhood Trauma Questionnaire-Short Form (CTQ-SF; Bernstein et al., 2003)*: The CTQ-SF is a 28-item retrospective self-report questionnaire designed to assess five types of childhood trauma: emotional abuse (e.g. “I felt that someone in my family hated me”), emotional neglect (e.g. “There was someone in my family who helped me feel that I was important or special”—reverse-scored), physical abuse (e.g. “People in my family hit me so hard that it left me with bruises or marks”), physical neglect (e.g. “My parents were too drunk or high to take care of the family”), and sexual abuse (e.g. “Someone molested me”). Respondents rate the extent to which each item



was true of them growing up on a five-point scale ranging from “Never true” to “Very Often True.” The CTQ-SF has demonstrated good internal consistency and test–retest reliability. The CTQ-SF has also demonstrated convergent and discriminant validity with therapists’ independent ratings of child abuse (Bernstein et al., 2003).

*Brief Symptom Inventory 18* (BSI; Derogatis, 2001): The BSI serves as a screen for psychological distress and consists of 18 items that measure symptoms that have occurred in the past week. The questionnaire assesses emotional and physical symptoms often associated with anxiety (e.g. “nervousness or shakiness inside”) and depression (e.g. “feeling blue”). Respondents rate each symptom on a 5-point scale ranging from 0 (not at all) to 4 (extremely). The BSI has demonstrated good internal consistency, test–retest reliability, and convergent and discriminant validity (Derogatis & Melisaratos, 1983; Morlan & Tan, 1998).

### *Statistical analysis*

Prior to hypothesis testing, data were examined to ensure that the assumptions of parametric testing were met. One variable that displayed a non-normal distribution (a subscale of the CTQ) was subjected to a logarithmic transformation so that it could be included in a regression analysis. Hypotheses were then tested using correlational and multiple regression methods. When interaction effects were tested in multiple regression, variables were mean-centered to prevent problems associated with multicollinearity (Holmbeck, 1998).

Although we did not advance any specific hypotheses about gender and ethnicity, we conducted exploratory analyses to determine whether these variables should be included in our regression models (e.g. we re-ran regression analyses with gender and ethnicity included as predictors). Unless otherwise specified in the results section, gender and ethnicity had no significant impact on the outcomes of interest.

## **Results**

The following results are presented: (1) absolute and relative strength of correlations between resilience and the “Big Five” factors of personality; (2) contributions of personality and coping styles to the prediction of resilience; and (3) the moderating effect of resilience on the relationship between childhood maltreatment and current psychiatric symptoms.

### *Relationship of resilience to the five factor model of personality*

Consistent with the study hypotheses, CD-RISC scores manifested statistically significant and salient ( $r > 0.30$ ) relationships with three of the five factor model personality constructs. Correlations of resilience with neuroticism, extraversion, conscientiousness, openness, and agreeableness were  $-0.65$ ,  $0.61$ ,  $0.46$ ,  $0.20$ , and  $0.15$ , respectively. These correlations indicate that resilience demonstrates a strong inverse relationship with neuroticism and strong positive relationships with extraversion and conscientiousness (all  $ps < 0.001$ ). Resilience also demonstrated a small but statistically significant positive relationship with openness ( $p < 0.05$ ), and a non-significant relationship with agreeableness ( $p = 0.10$ ).

Meng, Rosenthal, and Rubin's (1992) method for comparing correlated correlation coefficients was used to test the differential magnitude of the resilience/five-factor trait relationships. These tests confirmed that resilience manifests the strongest relationship to neuroticism, which is significantly stronger than its relationship to extraversion ( $z = -9.83$ ). The magnitudes of the relationships of extraversion and conscientiousness to resilience did not differ significantly ( $z = 1.92$ ); however, both are more strongly related to resilience than openness ( $z_s = 4.21$  and  $2.43$ , respectively). Finally, the strength of resilience's relationship to openness and agreeableness does not differ significantly ( $z = 0.50$ ), suggesting that both of these constructs have weak relationships with resilience despite the statistical significance of the correlation between resilience and openness.

*Effects of gender and ethnicity:* Fisher's method (Howell, 1997) was used to compare the correlation coefficients obtained for males and females, and for Caucasian and ethnic minority participants (sufficient  $n_s$  were not available to treat each ethnic group separately). None of the gender comparisons reached statistical significance ( $z_s = 0.05-1.09$ ). However, one ethnicity comparison was significant (all other  $z_s = 0.21-1.77$ ): the correlation between resilience and conscientiousness was significantly higher for members of ethnic minority groups than for Caucasian participants ( $r_s = 0.59$  and  $0.29$ , respectively;  $z = 2.03$ ).

#### *Contributions of personality and coping styles to the prediction of resilience*

Hierarchical multiple regression was used to test a model of personality, coping, and resilience. The first regression included the five-factor model traits that had salient relationships to resilience: neuroticism, extraversion, and conscientiousness. Coping styles were hypothesized to predict variance in resilience over and above the variance accounted for by broad personality dimensions. Therefore, we added the task-oriented coping and emotion-oriented coping subscales from the CISS as predictors in the second regression. These two scales were intended to represent generally adaptive and maladaptive methods of coping, respectively. Avoidance-oriented coping was not included in the model because this subscale was considered a heterogeneous mixture of adaptive coping (e.g. seeking social contact) and maladaptive coping (e.g. using substances).

Although some of the predictors entered into the regression models were significantly correlated, collinearity statistics were within the limits deemed appropriate for multiple regression (e.g. VIFs < 10, tolerances > 0.10; Belsley, Kuh, and Welsch, 1980). The first regression model was significant,  $R = 0.76$ ,  $R^2 = 0.57$ ,  $F(3, 128) = 57.13$ ,  $p < 0.001$ . All three five factor model traits contributed significantly to the prediction of resilience (Neuroticism:  $\beta = -0.40$ ,  $t = -5.93$ ,  $p < 0.001$ ; Extraversion:  $\beta = 0.36$ ,  $t = 5.44$ ,  $p < 0.001$ ; and Conscientiousness:  $\beta = 0.20$ ,  $t = 3.10$ ,  $p < 0.005$ ). The second regression model also was statistically significant,  $R = 0.82$ ,  $R^2 = 0.67$ ,  $F(5, 126) = 51.74$ ,  $p < 0.001$ . Moreover, this model explained significantly more variance than the model that included only the five factor model traits, as indicated by the hierarchical  $F$  test,  $F(2, 126) = 19.24$ ,  $p < 0.001$ ,  $R^2$  change = 0.10.

Examination of regression coefficients showed that both task-oriented coping and emotion-oriented coping contributed significantly to the prediction of resilience (Task-oriented coping:  $\beta = 0.39$ ,  $t = 6.06$ ,  $p < 0.001$ ; Emotion-oriented coping:  $\beta = -0.18$ ,  $t = -2.39$ ,  $p < 0.05$ ). While neuroticism and extraversion remained significant predictors of resilience after coping styles were

entered into the model (Neuroticism:  $\beta = -0.28$ ,  $t = -3.40$ ,  $p < 0.001$ ; Extraversion:  $\beta = 0.27$ ,  $t = 4.45$ ,  $p < 0.001$ ), conscientiousness did not ( $\beta = -0.01$ ,  $t = 0.16$ ,  $p > 0.80$ ).

It is of interest that conscientiousness failed to be a significant predictor of resilience once task-oriented coping was included in the regression model. Indeed, we had hypothesized that the good problem-solving skills of persons high on conscientiousness would be the main vehicle through which they would display more resilience. To test this mediational hypothesis statistically, the Sobel test of mediation was utilized (MacKinnon & Dwyer, 1993). Sobel's  $z$  indicated that task-oriented coping did in fact mediate the relationship between conscientiousness and resilience ( $z = 5.80$ ,  $p < 0.001$ ).

### *Trauma, resilience, and psychiatric symptoms*

Our final hypothesis was that resilience (as measured in young adulthood) would moderate the relationship between childhood trauma and current psychiatric symptoms. The emotional neglect subscale of the CTQ-SF (CTQ-EN) was used as a measure of childhood trauma, because this subscale had a more favorable distribution in the current sample than the other CTQ-SF subscales (i.e. other subscales had more positively skewed distributions). The log of the CTQ-EN subscale was entered as a measure of childhood trauma and the CD-RISC total score was entered as a measure of resilience. The BSI total score was used as a measure of current psychiatric symptoms.

To test the potential moderating effect of resilience on the relationship between trauma and psychiatric symptoms, a hierarchical multiple regression was conducted in which the CTQ-EN and CD-RISC scores were entered in the first step and a product term representing the interaction of CTQ-EN  $\times$  CD-RISC was entered on the second step. The outcome variable was total BSI score. Values of the predictor variables were mean-centered prior to the regression.

The first regression model was significant,  $R = 0.57$ ,  $R^2 = 0.33$ ,  $F(2, 128) = 30.80$ ,  $p < 0.001$ ; however, only resilience contributed significantly to the prediction of psychiatric symptoms (CTQ-EN:  $\beta = 0.12$ ,  $t = 1.49$ , *ns*; CD-RISC:  $\beta = -0.51$ ,  $t = -6.32$ ,  $p < 0.001$ ). The second regression model (which contained the interaction term) also was statistically significant,  $R = 0.62$ ,  $R^2 = 0.39$ ,  $F(3, 127) = 26.65$ ,  $p < 0.001$ . Moreover, this model explained significantly more variance than the first model, as indicated by the hierarchical  $F$  test,  $F(1, 127) = 12.72$ ,  $p < 0.001$ ,  $R^2$  change = 0.06. There was a significant main effect of resilience, as well as an effect of the interaction between resilience and emotional neglect, on psychiatric symptoms (CD-RISC:  $\beta = -0.52$ ,  $t = -6.78$ ,  $p < 0.001$ ; CD-RISC  $\times$  CTQ-EN:  $\beta = -0.26$ ,  $t = -3.57$ ,  $p < 0.001$ ).

To understand the nature of the interaction effect, high and low values of resilience and emotional neglect were entered into the regression equation. High values were defined as one standard deviation above the mean, while low values were defined as one standard deviation below the mean (Holmbeck, 1998). Fig. 1 shows the predicted BSI scores for hypothetical individuals classified as “low emotional neglect/low resilience,” “low emotional neglect/high resilience,” “high emotional neglect/high resilience,” and “high emotional neglect/low resilience.” The figure displays the main effect of resilience, in that individuals who endorsed high resilience generally had low psychiatric symptoms, no matter how much emotional neglect they reported. Moreover, the figure illustrates that resilience moderates the impact of childhood emotional neglect on current psychiatric symptoms—individuals who report significant emotional neglect



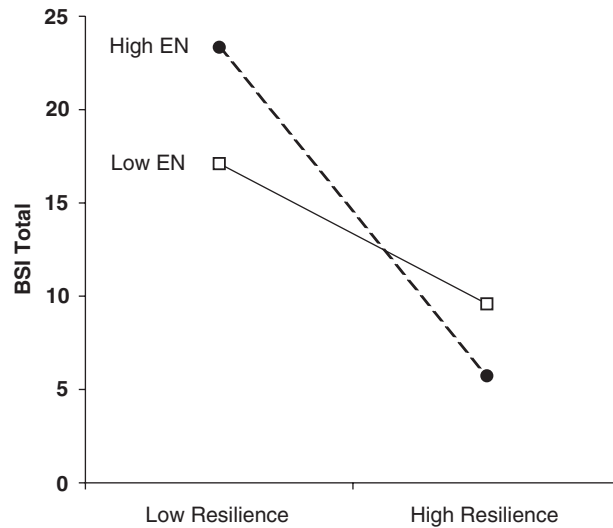


Fig. 1. Regression plot displaying the main effect of resilience and the emotional neglect (EN) x resilience interaction effect on current psychiatric symptoms.

and low resilience are highly symptomatic, while individuals who report significant emotional neglect and high resilience are virtually asymptomatic.

## Discussion

The current study evaluated hypotheses about the relationship of resilience to personality traits, coping, and psychiatric symptoms. The analyses also inherently tested the construct validity of the CD-RISC, a relatively new measure of resilience that can be administered to adults. Results were consistent with study hypotheses in that the self-report measure of resilience demonstrated meaningful relationships with well-established personality constructs and measures of coping, trauma, and psychiatric symptoms.

Resilience demonstrated a strong negative relationship with neuroticism, a construct that encompasses proneness to negative emotions, poor coping, and difficulty controlling impulses (Costa & McCrae, 1992). Although high neuroticism scores are not diagnostic of clinical problems, evidence suggests that neurotic people are indeed more vulnerable to emotional distress and disorder (Kling, Ryff, Love, & Essex, 2003; Ormel, Oldehinkel, & Vollebergh, 2004). In contrast, individuals with low neuroticism scores are conceptualized as well adjusted, emotionally stable, and able to cope with stress (Costa & McCrae, 1992). It is therefore unsurprising that resilience would demonstrate a strong negative relationship with neuroticism. One question that arises is whether the construct of resilience has incremental validity when compared to neuroticism (i.e. does the construct of resilience add anything to our understanding of mental health and disorder beyond that which is explained by neuroticism?). Indeed, vulnerability to stress is one facet of neuroticism and individuals who score low on this facet are very likely to obtain high scores on measures of resilience.

We believe that the incremental validity of the resilience construct merits additional study; however, we also feel that retaining resilience as an independent construct is warranted at this time. From a purely definitional perspective, researchers do intend to measure something more than simply lack of neuroticism when they measure resilience. Resilience is viewed as a dynamic concept capturing positive adaptation and even growth in the face of stress and trauma (Bonanno, 2004; Luthar & Cicchetti, 2000). Having a temperament characterized by low neuroticism does not necessarily mean that positive adaptation or growth will occur under adverse circumstances. From an empirical perspective, we conducted a preliminary analysis of the incremental validity of resilience by repeating the analysis of the relationship between childhood emotional neglect and current psychiatric symptoms, but with neuroticism (instead of resilience) as the moderating variable. Although neuroticism predicted increased psychiatric symptoms, it did not significantly moderate the relationship between childhood emotional neglect and current psychiatric symptoms.<sup>1</sup> At least in this analysis, resilience seemed to capture positive adaptation in response to stress more aptly than neuroticism did.

Resilience also was positively related to two other five-factor model traits: extraversion and conscientiousness. The strong relationship of resilience to extraversion likely reflects the benefits of positive affective style, capacity for interpersonal closeness, and high levels of social interaction and activity. In particular, positive affect has been shown to help individuals rebound subjectively and physiologically from stressful experiences (Tugade & Fredrickson, 2004). Fredrickson (2001) hypothesizes that positive emotions contribute to resilience because they broaden the “thought-action repertoires” that are available to individuals under stress. Having more flexible thinking and expanded behavioral options as a result of positive affect may increase the personal resources of extraverted individuals during times of adversity. Furthermore, the tendency of extraverted individuals to build strong networks of social support may allow them access to this important protective factor during stressful situations (Rutter, 1985). Results from a prospective study of high-risk children showed that infants with sociable temperaments were able to elicit more supportive responses from adults during childhood, which translated into better functional outcomes later in life (Werner & Johnson, 2004).

Although conscientiousness also demonstrated a positive relationship to resilience, a hierarchical regression showed that the tendency to use task-oriented coping fully explained this association. The active, problem-solving approach exemplified by task-oriented coping has been shown to promote effective recovery from many types of stressful situations (Penley et al., 2002; Zeidner & Saklofske, 1996). The hard-working style of conscientious individuals may lend itself well to this style of coping, allowing them to move beyond stressors effectively and experience a resulting sense of self-efficacy. While task-oriented coping may not be optimal in all situations (flexibility in coping also is important; cf. Bonanno, Papa, Lalande, Westphal, &

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<sup>1</sup>The first step of the hierarchical regression showed that a model including main effects of neuroticism and childhood emotional neglect on current psychiatric symptoms was significant,  $R = 0.66$ ,  $R^2 = 0.43$ ,  $F(2, 128) = 48.09$ ,  $p < 0.001$ . Both neuroticism and emotional neglect predicted psychiatric symptoms (Neuroticism:  $\beta = 0.59$ ,  $t = 8.40$ ,  $p < 0.001$ ; Emotional neglect:  $\beta = 0.16$ ,  $t = 2.29$ ,  $p < 0.05$ ). However, the addition of a neuroticism x emotional neglect interaction term in the second step was not significant, hierarchical  $F(1, 127) = 3.77$ , *ns*,  $R^2$  change = 0.02. Therefore, neuroticism was not shown to moderate the relationship between childhood emotional neglect and current psychiatric symptoms in the way that resilience did.

Coifman, 2004), it seems that a general tendency to respond to adversity with an active, problem-solving approach promotes resilience in conscientious individuals.

The contributions of conscientiousness and task-oriented coping to resilience may be even more pronounced for members of ethnic minority groups. In our sample, resilience and conscientiousness were modestly but significantly correlated for Caucasian participants ( $r = 0.29$ ), and strongly correlated for members of ethnic minority groups ( $r = 0.59$ ). This finding may be the result of chance characteristics of our sample, and needs to be replicated before strong inferences are made about the nature of resilience in ethnic minority groups. However, we can speculate that the types of hardships commonly faced by members of ethnic minority groups (e.g. reduced access to academic or occupational resources) are made more manageable by task-oriented coping and other facets of conscientiousness. The ability to tackle obstacles with an emphasis on hard work and problem solving—and relatively less emphasis on one's emotional reactions—may allow some individuals from ethnic minority groups to thrive. Moreover, conscientiousness may be more highly valued by certain ethnic groups than others. The cultural value placed on conscientious behavior may impact its relationship to resilience (e.g. individuals may display more resilience to a stressor if they judge themselves to have responded in a culturally appropriate manner). Unfortunately, the small sample size of our study restricted us to Caucasian versus ethnic minority comparisons, which are of limited value in assessing factors that promote resilience for different ethnic groups. Future studies should explore this question in a more refined manner.

Finally, resilience was found to moderate the relationship between retrospective reports of childhood emotional neglect and current psychiatric symptoms. Individuals who reported relatively high levels of emotional neglect during childhood also endorsed higher levels of current psychiatric symptoms, but only if they scored low on resilience. Individuals who experienced significant emotional neglect but scored high on resilience actually reported the lowest symptoms of all. One would intuitively expect low neglect/high resilience individuals to have the lowest levels of psychiatric symptoms; however, there are some plausible explanations for our finding that high neglect/high resilience individuals appeared healthier. First, the finding is consistent with Bonanno's (2004) contention that resilience constitutes not just recovery but growth and strengthening from adversity. Individuals who suffered some adversity in their home environments yet coped effectively may have experienced additional personal growth beyond that which characterized the young adults who came from more nurturing environments. The result also may be explained in the context of stress inoculation theory, whereby a psychological and physiological "toughening" occurs through exposure to moderate levels of stress (Rutter, 1987). Prior experience of stress during childhood and adolescence may in some cases increase resistance to more minor stresses, which could translate into lower levels of symptoms. Finally, individuals who display resilience in the face of childhood emotional neglect may represent a highly selective group of "super-resilient" individuals who are extremely unlikely to manifest psychiatric symptoms.

In addition to clarifying the relationships of resilience to personality, coping, and psychiatric symptoms, the current study aids in evaluating the construct validity of the CD-RISC. The convergent validity of the measure is supported by its positive relationships with a personality trait generally thought to correlate with mental health (extraversion) and an adaptive coping style (task-oriented coping), as well as its strong negative relationship with a personality trait

associated with susceptibility to stress (neuroticism). Discriminant validity is supported by the lack of salient relationships with the relatively unrelated constructs of openness and agreeableness. Moreover, the finding that CD-RISC scores moderated the relationship of childhood emotional neglect and current psychiatric symptoms suggests that this questionnaire measures a critically important aspect of resilience; namely, the ability to make positive adaptations in the face of stress.

The CD-RISC has emerged as a promising measure of the construct of resilience. However, further evaluation of this measure is needed including studies of its factor structure and investigations of its predictive and incremental validity. The measure includes some domains that appear less essential to the construct of resilience than others (e.g. spirituality vs. tolerance of stress and emotion). Future investigations of the measure may lead to a narrowing of its focus and a corresponding refinement of the definition of resilience that it captures.

In addition to further scrutiny of the CD-RISC, resilience research would benefit from the development and validation of alternate modes of resilience assessment. Because individuals are unlikely to be perfect judges of their own resilience, a more accurate assessment of resilience might be obtained through measures that capitalize on informant reports or coding of responses to stressful situations by clinicians or other expert observers. Furthermore, laboratory challenges should be used to test hypotheses regarding the biochemical, physiological, and neural response patterns associated with resilience (Charney, 2004), which could lead to identification of biological markers of this construct.

The current study has several limitations that are worth noting. First, the sample for this study was comprised entirely of college students, which limits the variation of age and education level. Results may not generalize to adults in middle or older age, or to individuals who have lower or higher educational achievement. On the other hand, the CD-RISC had not previously been examined in college students, so the current study adds to the literature on this measure by examining its validity in another demographic group.

The sample used in this study also had a relatively low incidence of childhood trauma, as indicated by the positively skewed distributions on the CTQ subscales. One challenge in studying resilience is that this construct encompasses reactions to certain types of life experience (i.e. trauma, stress) that not every person may have experienced. Although only a small proportion of our sample appeared to have experienced childhood maltreatment, we assumed that measuring resilience in the total sample was meaningful because most individuals have experienced some stress or adversity by young adulthood. However, some would argue that the construct of resilience is most germane to individuals who have experienced clear traumatic events. Therefore, it will be important to continue validation of the CD-RISC and investigation of factors that predict resilience in traumatized samples.

Cross-sectional measurement also limits our ability to draw causal conclusions from these data. Reports of childhood emotional neglect were retrospective and self-reported, and thus may not be fully accurate (e.g. they may be influenced by memory biases and social desirability). Moreover, mediation and moderation were tested in a purely statistical manner, and viable alternative models exist. For instance, we assumed that resilience led to fewer psychiatric symptoms in individuals with high levels of emotional neglect; however, it is also possible that psychiatric symptoms caused these individuals to represent themselves in a more negative way (e.g. depressive states might lead people to temporarily perceive themselves as less

resilient). Future studies with prospective designs could strengthen our ability to interpret the present results.

Despite these limitations, the present investigation increases understanding of an understudied phenomenon: resilient adaptation in adulthood. Resilience covaries with certain personality traits and coping styles, and moderates the impact of adversity on emotional health. Future studies will benefit from treating resilience as an important counterpart to vulnerability, deserving equal scientific scrutiny. A comprehensive biopsychosocial understanding of resilience could aid in the promotion of mental health and development of treatments that emphasize the building of psychological strength rather than simple remediation of symptoms. Existing results (including those of the present study) suggest that developing task-oriented coping skills and increasing access to experiences that elicit positive emotions and/or social support may help to promote resilience in the face of stress and adversity.

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