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Daily Cognitive Appraisals, Daily Affect, and Long-Term Depressive Symptoms: The Role of Self-Esteem and Self-Concept Clarity in the Stress Process

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Abstract

The current study investigated how self-esteem and self-concept clarity are implicated in the stress process both in the short and long term. Initial and 2-year follow-up interviews were completed by 178 participants from stepfamily unions. In twice-daily structured diaries over 7 days, participants reported their main family stressor, cognitive appraisals (perceived stressor threat and stressor controllability), and negative affect. Results of multilevel modeling indicated that high self-esteem ameliorated the effect of daily negative cognitive appraisals on daily negative affect. Self-concept clarity also buffered the effect of low self-esteem on depressive symptoms 2 years later. Our findings point to the vulnerability of those having low self-esteem or low self-concept clarity in terms of both short- and long-term adaptation to stress. They indicate the need for the consideration of such individual differences in designing stress management interventions.

Keywords

self-esteem, self-concept clarity, cognitive appraisals, stress and coping, depression

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The process of adaptation to stress involves dynamic cognitive and behavioral efforts to manage the ever-changing psychological stressors with which individuals must contend (Lazarus & Folkman, 1984). However, in addition to those dynamic efforts, a more comprehensive understanding of the stress process must include more stable self-views. An intriguing place for research on how people adapt to stressful circumstances is the interchange between those dynamic efforts and more stable aspects of the self (Bolger & Zuckerman, 1995; Lee-Bagley, Preece, & DeLongis, 2005).

Traditionally, self-views have been examined in terms of two components: evaluative and knowledge (Nezlek & Plesko, 2003). Self-esteem, an evaluative component of the self, is theorized to be a key resource that individuals use in the face of stressors (Taylor & Stanton, 2007). In addition, self-concept clarity, which is a knowledge component of the self, has been suggested to help individuals be more resilient in stressful circumstances (Campbell, 1990). However, the mechanisms through which those components of the self influence the stress process remain unclear (Baumeister, Campbell, Krueger, & Vohs, 2003; Kernis, 2005; Swann, Chang-Schneider, & Larsen-McClarty, 2007).

The present study attempted to shed light on the role of self-esteem and self-concept clarity in the stress process by examining their association with both short- and long-term adaptational outcomes. For the longer term, the interaction between self-esteem and self-concept clarity was examined in relation to adaptational outcomes over time. For the short term, we looked at the role of stable self-views in cognitive appraisals of daily stressors.

More specifically, we used a contextual model of stress and coping (DeLongis & Holtzman, 2005) and predicted that self-esteem and self-concept clarity would modify the way appraisals of daily interpersonal stressful events are associated with daily fluctuations of negative affect. As we measured negative affect twice a day over 7 days, we were able to control for morning negative affect when predicting evening

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negative affect. Our study combined within- and between-person designs. This allowed the investigation of individual differences in the daily stress process.

For long-term outcomes, we examined the relation between self-esteem, self-concept clarity, and depressive symptoms over a 2-year period. Recently, Swann et al. (2007) argued in favor of the investigation of knowledge components of the self as a way to clarify the somewhat controversial relation between self-esteem and important adaptational outcomes. Consistent with this, we suggest that the effect of self-esteem on outcomes is dependent on the level of one's self-concept clarity. We examined whether individuals with low self-esteem and low self-concept clarity are at increased risk for depressive symptoms 2 years later, after controlling for baseline depressive symptoms.

Our study focused on stress processes in couples living in stepfamilies. Because of the unique set of interpersonal stressors with which many stepfamilies must cope, this family form provides a rich context in which to examine stress processes. On average, those in stepfamilies face both higher levels of stress and a greater variety of stress than do those in first-marriage families (Bray & Berger, 1993; Hetherington, 1993). Indeed, the stress in blended families has been reported to be consistently higher than that in first marriages, matching the level of first marriages only by the 14th year of marriage (Zeppa & Norem, 1993).

Adaptation to Stress

Individuals are faced with stressful episodes in their daily life (Bolger, DeLongis, Kessler, & Schilling, 1989), and although those episodes per se can take a toll on affective states (Hammen, 2005; Van Eck, Nicolson, & Berkhof, 1998), how individuals appraise the episodes plays a significant role in resulting affect (Baum, Fleming, & Singer, 1983; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Key dimensions of cognitive appraisal include: (a) how *threatening* the situation is (primary appraisal) and (b) evaluating the possibilities for overcoming or dealing with a stressor, as assessed with perceptions of how *controllable* the stressor is (secondary appraisal; Lazarus & Folkman, 1984).

Cognitive appraisals have been found to play a major role in how people respond to a stressful situation (Franks & Roesch, 2006; Lee-Bagley et al., 2005) and to ultimately have an effect on adaptational outcomes (Bouchard, Guillemette, & Landry-Leger, 2004; Denson, Spanovic, & Miller, 2009). Individuals who perceive events as uncontrollable (Van Eck et al., 1998), impactful (Timmermans, van Mechelen, & Nezlek, 2009), or threatening (Nezlek, Vansteelandt, van Mechelen, & Kuppens, 2008), or react more adversely to stressful events (i.e., have high affective reactivity) are more likely to experience negative affect or develop depressive symptoms over time (Cohen, Gunther, Butler, O'Neill, & Tolpin, 2005).

A contextual model of stress and coping suggests that there are three key contextual factors that influence the appraisal and outcomes of stressful events: the nature of the event, the social context in which the stress occurs, and stable aspects of the self (DeLongis & Holtzman, 2005). These factors are proposed to have synergistic effects on stress outcomes.

Although DeLongis and Holtzman (2005) and others (Bolger & Zuckerman, 1995) have demonstrated a key role of stable person traits in coping efforts, the proposed interplay between personality, affect, and *cognitive appraisals* of stress is largely unexplored (Tong, 2010). Recently, Nezlek et al. (2008), Timmermans et al. (2009), and Tong (2010) have shown that the effect of appraisals on affective states is influenced by individual differences and personality traits (extraversion and neuroticism). For example, events that were considered impactful were associated with more arousal among individuals low on extraversion and with less pleasantness among those high on neuroticism (Timmermans et al., 2009). Tong found that higher levels of neuroticism were also associated with stronger appraisal-affect relations, indicating that individuals higher on neuroticism are more emotionally reactive to negative appraisals. Those recent findings, together with theoretical suggestions (DeLongis & Holtzman, 2005), indicate that we can expect a dynamic interrelation between stable personality factors and appraisals in predicting affective states and adaptation to stress. Interestingly, there is no evidence that stable self-views, such as self-esteem and self-concept clarity, can play a similar role in the stress process, and so our study seeks to contribute to the emerging literature on the role of personality traits in the appraisal-affect relation by looking more closely at the role of those two stable aspects of the self.

Self-Esteem and the Stress Process

Self-esteem is often conceptualized as a protective psychological resource that enables people to adapt and recover from stressful events (Greenberg et al., 1992). Researchers have established an association between low levels of self-esteem and poorer adaptational outcomes, such as depression and negative affect (Nezlek & Plesko, 2003; Orth, Robins, Trzesniewski, Maes, & Schmitt, 2009). Individuals with high self-esteem have been found to apply stress-reducing strategies that help them keep unpleasant and ruminative thoughts at bay (S. M. Smith & Petty, 1995). Applying those strategies over long periods can have positive influences on adaptational outcomes.

Although past research has suggested a main effect of self-esteem on adaptational outcomes, much attention has been devoted to understanding how self-esteem acts as a diathesis to stress (Butler, Hokanson, & Flynn, 1994). In line with the contextual model of stress and coping, we propose that self-esteem is associated with adaptation to stress by changing the impact of stress appraisals on adaptational outcomes.

We propose that negative cognitive appraisals (such as perceptions of threat and uncontrollability) can be particularly harmful to individuals with low self-esteem because they provide opportunity for negative feedback and emotional uncertainty (Bouchard et al., 2004). Low-self-esteem individuals are especially vulnerable to those unstable and negative circumstances because their feelings of self-worth tend to drop under failure (Brown & Dutton, 1995), they are more concerned about self-protection in stressful situations (Bernichon, Cook, & Brown, 2003), and they are more likely to have depressive attributions in response to negative events (Tennen, Herzberger, & Fisher Nelson, 1987). They also have a tendency to overgeneralize the negative consequences of a stressful situation (Kernis, Brockner, & Frankel, 1989) and find it difficult to repair their negative moods (Heimpel, Wood, Marshall, & Brown, 2002). The effects of these maladaptive responses to stressful situations can be aggravated when stressors are perceived as threatening and uncontrollable, first, because they can further impede an individual's ability to cope successfully and, second, because those perceptions only verify the initial negative biases.

In other words, a situation that is perceived as threatening and uncontrollable combined with low self-esteem can be expected to result in more pronounced unfavorable outcomes. The same situation can have very different results for individuals with high self-esteem. The ability of high-self-esteem individuals to focus on positive evaluations of the self (Bernichon et al., 2003) can help them recover from situations viewed as threatening and uncontrollable. They may thus suffer less from a negatively appraised encounter. Based on this, we expected self-esteem to moderate the relation between cognitive appraisals and daily negative affect. More specifically, we hypothesized the following:

Hypothesis 1: Higher self-esteem attenuates the negative effect of perceived threat on evening negative affect, after controlling for morning negative affect.

Hypothesis 2: Higher self-esteem attenuates the negative effect of low perceived stressor controllability on evening negative affect, after controlling for morning negative affect.

Self-Concept Clarity and the Stress Process

Self-concept clarity is the extent to which an individual's self-beliefs are clearly and confidently defined, internally consistent, and temporally stable (Campbell et al., 1996). Self-concept clarity has been found to predict depressive symptoms both cross-sectionally (M. Smith, Wethington, & Zhan, 1996; Treadgold, 1999) and prospectively (Campbell et al., 1996).

In addition to a direct effect on adaptational outcomes, self-concept clarity could play a protective role against important life stressors because individuals with a clear self-concept may be less affected by and more able to cope with

negative appraisals. For example, individuals who are certain of their self-beliefs (i.e., high self-concept clarity) are more likely to use the self to guide decisions (Setterlund & Niedenthal, 1993), to seek out verifying feedback on beliefs about which they are certain (Swann & Read, 1981), and to be more resistant to changing their self-beliefs (Swann & Ely, 1984; Swann, Pelham, & Chidester, 1988), hence being more resilient to stressors. When those individuals have to deal with stressors that are perceived as threatening and uncontrollable, they can be expected to respond more effectively by using their stable and clear aspects of the self. On the other hand, individuals with a confused self-concept are more likely to exhibit heightened reactions to stressful events because their self-concept does not provide them with effective and consistent input on how to behave (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000).

A recent study offers a direct test of this hypothesis in a sample of 217 university students (Constantino, Wilson, Horowitz, & Pinel, 2006). In this study, self-concept clarity did not ameliorate the negative effect of stressful life events on depressive symptoms and perceived stress. However, a direct association was found between baseline self-concept clarity and perceived stress 2 weeks later.

There are three key differences between the study by Constantino et al. (2006) and the present study. First, Constantino et al.'s study investigated the role of self-concept clarity in a sample of university students, whereas the current study examines a sample of persons in stepfamilies. Students may contend with a narrower range of stressors than do persons in stepfamilies, and this could limit the scope of the stress process that can be examined. Stepfamilies contend with a broad array of interpersonal stressors and challenges, and this provides a rich context in which to examine the stress process (Preece & DeLongis, 2005). Second, and perhaps more important, Constantino et al.'s study employed a between-subject design, whereas the present study looks at within-subject variation in the stress process. Associations found with between-subject studies can differ in both magnitude and direction from those found using a within-subject design (DeLongis, Hemphill, & Lehman, 1992; Tennen, Affleck, & Armeli, 2003). Finally, Constantino et al. investigated number of stressful life events, whereas we examine more specific aspects of stressor appraisals, namely, perceived threat and controllability.

In summary, past studies point to a direct effect of self-concept clarity on adaptational outcomes. Although, like self-esteem, self-concept clarity could play a buffering role in the stress process, only one study (Constantino et al., 2006) examined this possibility and found no support. Given the lack of existing evidence and the methodological differences between Constantino et al.'s study and the present one, this study is exploratory with regard to the buffering effect of self-concept clarity on the relation between cognitive appraisals and daily negative affect.

Relation Between Self-Concept Clarity and Self-Esteem

Self-esteem and self-concept clarity are conceptually distinct aspects of the self-concept. Self-esteem captures how *positively* one regards oneself, whereas self-concept clarity captures how *well* one knows oneself. Campbell et al. (1996) demonstrated that despite a significant positive correlation between self-concept clarity and measures of self-esteem, self-concept clarity and self-esteem can be reliably differentiated from one another. Given this assertion, examining the role of self-concept clarity in addition to that of self-esteem in the stress process may lead to increased understanding of how adaptational outcomes are influenced by self-views.

An individual with both low self-esteem and low self-concept clarity could be expected to have increased vulnerability to negative self-relevant information in daily life as compared to an individual with low self-esteem and high self-concept clarity (Campbell, 1990). Low self-esteem would lead an individual to accept negative feedback more readily, which coupled with further uncertainty, due to low self-concept clarity, can be expected to lead to more pronounced negative affective outcomes.

On the other hand, low-self-esteem individuals whose self-view is more confidently defined and more stable temporally (i.e., higher self-concept clarity) are better equipped to cope with stressful circumstances because they are more likely to use effective coping strategies (M. Smith et al., 1996). In this case, high self-concept clarity can be thought to ameliorate some of the negative effects of low self-esteem on adaptational outcomes. Consistent with this theorizing we examined whether self-concept clarity moderates the effects of self-esteem on long-term depressive symptoms. We hypothesized the following:

Hypothesis 3: Low self-esteem is associated with more depressive symptoms 2 years later for individuals with lower self-concept clarity, compared to individuals with higher self-concept clarity, after controlling for baseline depressive symptoms.

Method

Procedures

Data were collected as part of a larger research project that included telephone interviews, questionnaires and daily paper diaries (see DeLongis, Capreol, Holtzman, O'Brien, & Cambell, 2004). Each participant first completed a telephone interview. Then, participants completed an initial questionnaire that assessed levels of self-esteem, self-concept clarity, and depressive symptoms. This was followed by a week-long twice-daily paper diary measuring cognitive appraisals of interpersonal family stressors and negative affect. Two

years later, participants were recontacted by phone and completed assessments of depressive symptoms. Daily diaries were completed around lunchtime and before bedtime. Negative affect was assessed twice daily, whereas cognitive appraisals were included only in the evening diary.

We took several steps to help participants familiarize themselves with the diaries, build rapport, and maximize compliance, as emphasized by Green, Rafaeli, Bolger, Shrout, and Reis (2006). Green et al. demonstrated that the adoption of such measures greatly increased compliance, such that the quality of data collected with paper diaries became equivalent to that of data collected with electronic methods. To this effect, first, we conducted an initial telephone interview with each spouse to explain the purpose of the study, collect information on marital quality and other relevant variables, and discuss the questionnaire and diary portions of the study. Participants had the opportunity to express concerns and ask questions about how to complete the paper diaries, and they were encouraged to contact the researcher if they had more questions. This initial contact helped establish strong rapport with our participants.

Second, and in line with Green et al.'s (2006) recommendations, our protocol did not require participants to complete diaries at exact times but instead asked them to do so around lunchtime and before bedtime. This ensured that the study accommodated the needs and daily routines of our participants. This also eased the burden of participating, as there was a window of several hours to complete the diary. If participants did not complete the diary within the window requested, they were asked to complete it as soon as possible, indicating the *actual* completion time.

Third, the daily diaries were very brief (taking only a few minutes to complete), which limited participant burden and followed Green et al.'s (2006) recommendation for increasing compliance. Fourth, participants were explicitly asked to complete the diary independently of their spouse. They were also given adhesive tapes to seal each entry once completed as well as stamped envelopes to return each diary. Finally, Green et al. have suggested that compliance in studies on couples may be higher, as the spouses tend to remind each other to complete the diaries.

There was a within-person average of 93% complete data, with 65% of participants providing complete data for all scales at all times. Ninety percent of participants completed all diaries, with the remaining 10% missing on average 2.3 diaries ($SD = 1.3$). Similar rates for complete data have been reported by Diamond, Hicks and Otter-Henderson (2008). On average, participants reported 4.7 stressful family events ($SD = 1.5$) over 1 week, with 21% of participants reporting 3 or fewer stressful family episodes.

Participants

Participants were recruited through newspaper and radio advertisements (71%) and notices in school newsletters,

posters on community bulletin boards, and recruitment at local stepfamily support groups (29%). The participant pool was limited to individuals who were either married or living common law, and had at least one child from a previous union (of either spouse) living in the home for at least 3 months of the year. Also, participation was limited to those who were fluent in English. Three hundred and eight individuals participated in the initial interview. Of these, 178 (57%) individuals returned completed daily diaries and questionnaires and comprised our final sample.

Participants who completed the daily diaries were compared with those who did not complete the diaries, on the basis of education, income, years in the stepfamily, number of children from the current union, average age of children in the stepfamily, and relationship quality. The only significant difference was the average age of the children. In stepfamilies in which participants completed diary data the children were older than in stepfamilies in which participants did not complete the diaries ($M_s = 12.02$ and 9.79 , respectively), $t(153) = 2.94, p < .01$.

The participants were 52.8% female ($n = 94$). The mean age of participants was 41 years ($SD = 6.38$), ranging from 21 to 60 years. The majority of participants were Canadian born (74%), with the remainder largely from other English-speaking countries such as Great Britain (8.4%) and the United States (7.3%). The mean level of education was 14 years ($SD = 2.30$), ranging from 5 to 17 years. Participants were predominantly middle to upper-middle class, and the majority were employed outside the home (80%). At the time of the interview, participants had spent an average of 4.6 years living with their current spouse ($SD = 3.1$), ranging from 1 to 11 years. The majority of participants (77%) had been married at least once previously. The mean number of children in the stepfamily was 3.1, ranging from 1 to 8 children. The children spent, on average, 7.8 months of the year in the stepfamily home.

Telephone Interview and Questionnaire

Demographics. Demographics were assessed during the initial telephone interview. Age, gender, education, and self-reported total family income were used as control variables in the study.

Self-concept clarity. Participants completed the 12-item Self-Concept Clarity Scale (Campbell et al., 1996). Answers were given on a 5-point scale (1 = *not at all descriptive of me*, 3 = *perhaps descriptive of me*, 5 = *very descriptive of me*). Example items were "My beliefs about myself often conflict with one another" (reversed), "Sometimes I think I know other people better than I know myself" (reversed), and "In general, I have a clear sense of who I am and what I am." In this sample, the Cronbach's alpha was .86. Higher scores reflect greater self-concept clarity.

Self-esteem. The 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to assess self-esteem. Participants

gave their answers on a 5-point scale (1 = *not at all descriptive of me*, 3 = *perhaps descriptive of me*, 5 = *very descriptive of me*). The internal consistency for self-esteem was high ($\alpha = .88$). Higher scores represent greater self-esteem.

Depressive symptoms. The 20-item Center for Epidemiologic Studies Depression Scale (Radloff, 1977) was used to measure depressive symptoms both at baseline and 2 years later. Responses to statements were given on a 4-point scale (1 = *rarely or none*, 2 = *some*, 3 = *occasionally*, 4 = *most or all of the time*). We constructed scores by averaging across each person's answers. In this sample, Cronbach's alpha was .93. Higher scores represent greater depressive symptoms.

Daily Diary Measures

Cognitive appraisals. Participants were asked to report the most bothersome interpersonal family event or problem for that day, and they completed a seven-item measure of stressor threat appraisal and a single item measure of stressor controllability adapted from items used in previous coping studies (Folkman et al., 1986; Folkman & Lazarus, 1980). Participants were asked: "To what extent would you say each of the following was of concern to you in this situation?" Items regarding perceived stressor threat included: "things not running as smoothly as you would like," "not accomplishing something you set out to do," "not getting the support and understanding you want," "losing someone's respect and love," "losing your self-respect," "harm to your physical health or safety," and "something bad happening to someone you care about." The response format was a 3-point scale ranging from 1 (*not at all*) to 3 (*a lot*). The ratings on the seven items were combined into a single score, with higher scores reflecting an appraisal of greater threat. The reliability for both perceived threat and stressor controllability was ICC = .80, representing the generalizability of the person level means averaged across items and days (Nezlek, 2007). The respondent's secondary appraisal of perceived control over the stressful situation was assessed with the following question: "With this problem today, how much control or influence did you feel you had over the way that the problem was handled?" The respondent used a 4-point scale ranging from 1 (*not at all*) to 4 (*a lot*). Higher scores reflect greater perceived stressor controllability.

Daily negative affect. Negative affect was measured with a short form of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Participants reported the extent to which they experienced five feelings (i.e., feeling guilty, nervous, upset, irritable, and afraid). Given that the PANAS does not tap deactivated emotion, we also asked participants to complete an additional item representing sadness derived from the Affects Balance Scale (Derogatis, 1975). Participants were asked to rate all items in terms of their mood since their last diary entry on a 3-point scale (1 = *not at all*, 3 = *a lot*). The reliability for negative affect was ICC = .85 (Nezlek, 2007).

Handling of Missing Data

The burden placed on participants in daily process methodology inevitably results in instances of missing data (Little & Rubin, 1987; Little & Shenker, 1995; Schafer, 1997). The present study conducted multilevel regression analyses using hierarchical linear modeling (HLM) software (version 6.04; Raudenbush, Bryk, Cheong, & Congdon, 2004), which deals with any missing variable at the trait level by casewise deletion.

To avoid casewise deletion, multiple imputation was performed. Multiple imputation involves multiple, model-based imputations resulting in M "complete" data sets. The statistical package NORM (Schafer, 1999) was used to perform the multiple imputations in the present study. Five imputations were performed, as three to five imputed files are typically sufficient for an effective imputation (Schafer & Olsen, 1998).

In the present study, multiple imputation was performed to "fill in" the following variables: education (2.8% missing data), family income (2.8% missing data), self-esteem (0.6% missing data), self-concept clarity (3.4% missing data), Time 1 (T1) depressive symptoms (5.3% missing data), and Time 2 (T2) depressive symptoms (7.3% missing data). In addition to the relations among these variables, other variables from the larger data set—that is, the five subscale scores of the NEO Five Factor Inventory (Costa & McCrae, 1992), trait rumination and trait reflection (Rumination-Reflection Questionnaire; Trapnell & Campbell, 1999), T1 and T2 marital satisfaction (Dyadic Adjustment Scale; Spanier, 1976)—and the aggregated values of the daily-level study variables were included to generate more accurate replacements. Each of the five imputed data sets was then analyzed with HLM so that each reported model had, in effect, five sets of parameter estimates (e.g., five b s, five SE s, etc.). These five sets of parameter estimates were combined using a series of formulae that properly account for the standard error of the averaged parameter estimates (Schafer, 1997, pp. 108-110).

Results

Descriptive Statistics

Paired t tests comparing T1 and T2 depressive symptoms revealed that participants were reporting fewer depressive symptoms at T2, $t(160) = 2.44, p < .05$.

Mixed-Level Regression Analyses

Hypotheses 1 and 2 used both daily process data and panel data, and they were tested with a three-level model (HLM3); Hypothesis 3 used panel data only and was tested with a two-level model (HLM2). Using HLM3, within-person variation (i.e., repeated measures) was modeled at Level 1, between-person variation was modeled at Level 2, and the nesting of

individuals within couples was controlled for at Level 3. Level 1 predictor variables were centered around the mean of each individual's score over the course of the diary (Blackwell, Mendes de Leon, & Miller, 2006; Nezlek, 2001; Schwartz & Stone, 1998). Within-person aggregate means were calculated for each person-centered Level 1 predictor variable and entered at Level 2. This ensured that treatment of the intercepts as random factors did not bias the coefficients of the within-person factors (Schwartz & Stone, 1998). Level 2 study variables (self-esteem, self-concept clarity, T1 and T2 depressive symptoms) were standardized, whereas demographic variables (age, gender, family income, education) were left unstandardized. Level 2 variables were centered around the grand mean of that variable.

An examination of the null model to determine the proportion of between- and within-person variability present in the dependent variable (Nezlek, 2001) indicated that 19% of the variance was due to couples, 13% was due to differences between individuals, and 68% was due to variance within individuals, plus error.

Initial models were run in which each of the demographic variables (age, gender, education, family income) was modeled individually onto NA_{PM} (evening negative affect) while controlling for NA_{AM} (daytime negative affect). None of the demographic variables were found to be significantly related to NA_{PM} . Hence, in accordance with recommended multi-level model specifications for dropping nonsignificant predictors (Kreft & de Leeuw, 1998; Raudenbush & Bryk, 2002; Snijders & Bosker, 1999), subsequent HLM3 analyses did not include any demographic control variables.

Self-Esteem and Self-Concept Clarity Moderate the Relation Between Cognitive Appraisals and Daily Negative Affect

Before examining the moderating effects, we looked at the main effects of cognitive appraisals on daily negative affect. Results indicated that when the most stressful situation of the day was appraised as more threatening or less controllable than an individual's own mean threat and controllability appraisal over the week, there was a significant positive association with NA_{PM} , $b = 0.31, t(780) = 6.71, p < .001$ for threat appraisal, and $b = -0.03, t(766) = -1.9, p = .058$ for controllability, above and beyond the significant effect of NA_{AM} .

Next, we examined whether between-person differences in levels of self-esteem and self-concept clarity moderated the association of within-person variation in appraisals and fluctuations in daily negative affect. The following random intercept model was run on day i for person j in couple k :

$$\text{Level 1: } Y_{ijk}(NA_{PM}) = \pi_{0jk} + \pi_{1jk}(\text{Threat Appraisal}) + \pi_{2jk}(NA_{AM,ijk}) + e_{ijk}$$

Table 1. Relations of Morning Negative Affect, Self-Esteem, Self-Concept Clarity, Threat Appraisal, and Stressor Controllability With Evening Negative Affect

Effect	NA _{PM}			
	B	SE	B	SE
Aggregate mean of NA _{AM}	0.68***	0.06	0.69***	0.07
NA _{AM}	0.12	0.06	0.19**	0.06
Aggregate mean of threat appraisal	0.05	0.05		
Threat appraisal	0.29***	0.04		
Self-esteem	0.01	0.01	0.02	0.02
Self-concept clarity	-0.04*	0.01	-0.04*	0.02
SE × Threat Appraisal	-0.09*	0.04		
SCC × Threat Appraisal	-0.01	0.04		
Aggregate mean of stressor controllability			-0.01	0.07
Stressor controllability			-0.02	0.01
SE × Stressor Controllability			0.03*	0.02
SCC × Stressor Controllability			0.01	0.03
Level 1 residual SD	0.26		0.27	
Level 2 intercept SD	0.00		0.00	
Level 3 intercept SD	0.07		0.06	

This table represents the combined results from the five imputed data sets that were analyzed using a three-level hierarchical linear model (HLM3). NA_{PM} = evening negative affect; NA_{AM} = morning negative affect; SE = self-esteem; SCC = self-concept clarity. **p* < .05. ***p* < .01. ****p* < .001.

Level 2: $\pi_{0jk} = b_{00} + b_{01}(SE) + b_{02}(SCC) + b_{03}(\text{Threat Appraisal}_{AGGR}) + b_{04}(NA_{AM_AGGR}) + r_{0jk}$
 $\pi_{1jk} = b_{10} + b_{11}(SE) + b_{12}(SCC)$
 $\pi_{2jk} = b_{20}$
 Level 3: $b_{00} = \gamma_{000} + u_{00k}$
 $b_{01} = \gamma_{010}$
 $b_{02} = \gamma_{020}$
 $b_{03} = \gamma_{030}$
 $b_{04} = \gamma_{040}$
 $b_{10} = \gamma_{100}$
 $b_{11} = \gamma_{110}$
 $b_{12} = \gamma_{120}$
 $b_{20} = \gamma_{200}$

A similar model was run for stressor controllability. Combined results from the five imputed data sets demonstrated that self-esteem, but not self-concept clarity, moderated the relation between threat appraisal and NA_{PM}, $b = -0.09$, $t(776) = -2.02$, $p < .05$, and between stressor controllability and NA_{PM}, $b = 0.03$, $t(762) = 2.03$, $p < .05$ (see Table 1).

To illustrate the nature of the interactions between self-esteem and cognitive appraisals on NA_{PM}, simple slopes regression analyses were conducted (Aiken & West, 1991). As shown in Figure 1, the significant positive association between a stressful situation being appraised as more threatening than an individual’s own mean threat appraisal over the week and NA_{PM} was attenuated in participants with higher (i.e., 1 SD above the mean), $b = 0.20$, $t(776) = 3.46$, $p < .01$, versus lower (i.e., 1 SD below the mean), $b = 0.38$, $t(776) = 6.10$, $p < .001$, self-esteem.

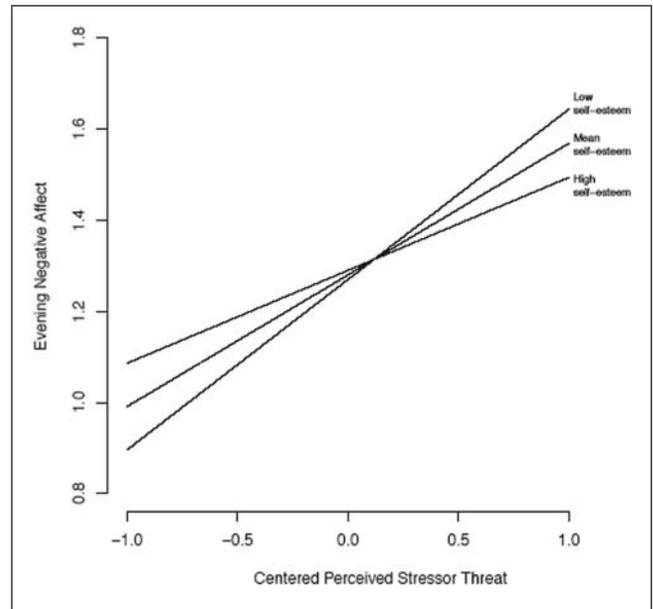


Figure 1. Evening negative affect as a function of threat and self-esteem

For stressor controllability, simple slopes analyses indicated that there was a significant negative relation between appraising the most stressful situation of the day as more controllable than an individual’s own mean of stressor controllability and NA_{PM} for participants with lower levels of self-esteem (i.e., 1 SD below the mean), $b = -0.05$, $t(762) = -2.75$, $p < .01$. However,

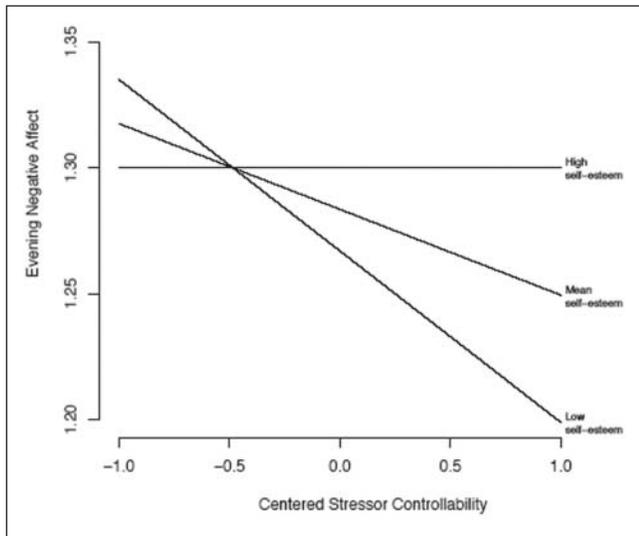


Figure 2. Evening negative affect as a function of stressor controllability and self-esteem

this relation is attenuated in participants with mean levels of self-esteem, $b = -0.02$, $t(762) = -1.75$, $p > .05$, and higher levels of self-esteem (i.e., 1 *SD* above the mean), $b = 0.01$, $t(762) = 0.48$, $p > .10$ (see Figure 2). In Figure 2, when those lower in self-esteem appraised their most bothersome event of the day as particularly controllable (i.e., more controllable than their average controllability rating over 1 week), they showed the lowest NA_{PM} . However, it is important to note that the findings control for NA_{AM} . So, essentially, the finding here means that those lower in self-esteem have the largest *change* in negative affect from morning to evening, depending on how controllable they appraise the daily stressor.^{1,2,3}

Moderated Effects of Self-Esteem and Self-Concept Clarity on T2 Depressive Symptoms

We examined T2 depressive symptoms as a function of between-person variation in self-esteem and self-concept clarity while controlling for initial depressive symptoms and demographic variables. We used a fixed-effects HLM2 model.⁴ Initial models testing for potential effects of demographic variables (age, gender, education, family income) on T2 depressive symptoms, while controlling for T1 depressive symptoms, revealed that gender and family income were significant predictors. Nonsignificant demographic predictors were dropped from further analyses.

To examine the moderated effects of self-esteem and self-concept clarity on T2 depressive symptoms while controlling for T1 depressive symptoms, the following model was run for any person i in couple j :

$$\text{Level 1: } Y_{ij}(\text{T2 Depression}) = b_{0j} + b_{1j}(\text{Gender}) + b_{2j}(\text{Income}) + b_{3j}(\text{T1 Depression}) + b_{4j}(\text{SE}) + b_{5j}(\text{SCC}) + b_{6j}(\text{SE} \times \text{SCC}) + r_{ij}$$

Table 2. Multilevel Relations of Initial Depressive Symptoms, Gender, Income, Self-Esteem, and Self-Concept Clarity With 2-Year Follow-Up Depressive Symptoms

Effect	Depressive symptoms T2	
	B	SE
Depressive symptoms T1	0.19*	0.09
Gender ^a	0.15*	0.06
Family income	-0.00**	0.00
Self-esteem	0.02	0.09
Self-concept clarity	-0.21*	0.08
SE \times SCC	0.16*	0.06

This table represents the combined results from the five imputed data sets that were analyzed using a two-level hierarchical linear model (HLM2).

T1 = Time 1; T2 = Time 2; SE = self-esteem; SCC = self-concept clarity.

^aHigher values on gender denote women.

* $p < .05$. ** $p < .01$.

$$\begin{aligned} \text{Level 2: } & b_{0j} = \gamma_{00} \\ & b_{1j} = \gamma_{10} \\ & b_{2j} = \gamma_{20} \\ & b_{3j} = \gamma_{30} \\ & b_{4j} = \gamma_{40} \\ & b_{5j} = \gamma_{50} \\ & b_{6j} = \gamma_{60} \end{aligned}$$

Combined results from the five imputed data sets indicated that higher levels of self-concept clarity were significantly associated with fewer T2 depressive symptoms, $b = -0.21$, $t(171) = -2.52$, $p < .05$.⁵ Also, the interaction between self-esteem and self-concept clarity was significantly associated with depressive symptoms at 2-year follow-up, $b = 0.16$, $t(171) = 2.55$, $p < .05$ (see Table 2).⁶ In addition, participants with lower levels of family income and women reported more T2 depressive symptoms, $b = -0.003$, $t(171) = -2.85$, $p < .01$, and $b = 0.15$, $t(171) = 2.42$, $p < .05$, respectively.

Simple slopes regression analyses (see Figure 3) showed that for participants with lower levels of self-esteem (i.e., 1 *SD* below the mean), self-concept clarity was significantly and negatively associated with T2 depressive symptoms, $b = -0.36$, $t(171) = -3.91$, $p < .001$. It is important to note that we found no individuals with low self-esteem and high self-concept clarity, so that the positive association mentioned above relates to low and medium levels of self-concept clarity. For individuals with higher levels of self-esteem (i.e., 1 *SD* above the mean), self-concept clarity was not significantly associated with T2 depressive symptoms, $b = -0.03$, $t(171) = -0.24$, $p > .10$.

Discussion

The present study investigated the prospective roles of self-esteem and self-concept clarity in the stress process, examining both short- and long-term outcomes. Both self-esteem and self-concept clarity were found to be implicated in the

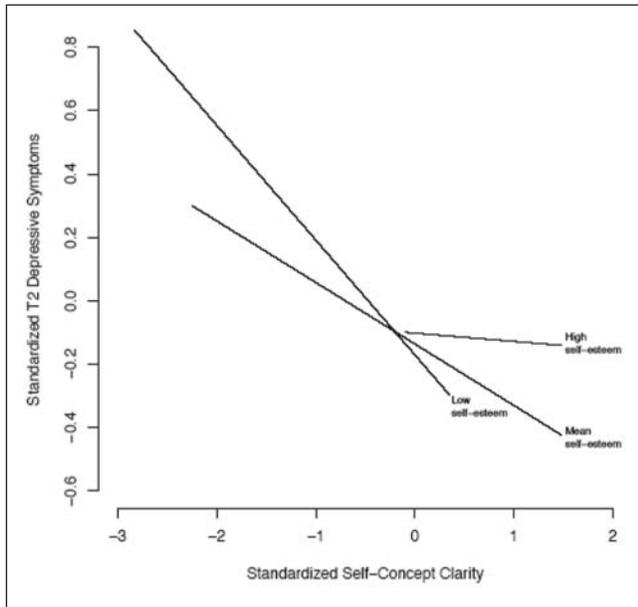


Figure 3. Two-year follow-up depressive symptoms as a function of self-concept clarity and self-esteem
T2 = Time 2.

stress process. For the long term, the interaction between self-esteem and self-concept clarity was associated with depressive symptoms over a 2-year period. In the short term, this interaction was not significantly associated with daily negative affect. Rather, stable self-views influenced daily negative affect by moderating the effectiveness of cognitive appraisals. We found that having higher self-esteem played a buffering role in the daily stress process, especially against stressors that were considered threatening and uncontrollable.

Our examination of short-term outcomes demonstrated that higher self-concept clarity was associated with lower average levels of evening negative affect over a 7-day period, controlling for morning negative affect and self-esteem. This finding agrees with prior research on self-concept clarity using different methodologies, such as experimental work (Stucke & Sporer, 2002) and cross-sectional assessments (Bigler, Neimeyer, & Brown, 2001). These studies together suggest that having a sense of self that is clear and temporally stable contributes considerably to psychological adjustment.

Recently, research on the situational specificity of personality traits has shown that appraisals can moderate the trait-affect relation (Timmermans et al., 2009; Tong, 2010). We found a significant interaction between self-esteem and daily stressor appraisals. More specifically, self-esteem attenuated the detrimental effect of negative stressor appraisals on daily negative affect. When participants appraised their most important stressful event of the day as more threatening, those with high self-esteem tended to experience lower subsequent negative affect than those with low self-esteem.

We found similar results with regard to low stressor controllability. Those with high self-esteem did not seem to be affected by lower controllability. In other words, high self-esteem buffered the negative effects of perceived lack of control over the most bothersome event of the day.

Interestingly, as perceptions of stressor controllability increased, those with *low* self-esteem tended to report greater decreases in negative affect, indicating that stressor controllability was particularly beneficial for low-self-esteem individuals. This is an interesting finding and confirms prior work on emotional reactivity associated with low self-esteem (Greenier et al., 1999). On days when low-self-esteem individuals are confronted with uncontrollable events, they experience heightened negative affect; on days when events are perceived as controllable, negative affect greatly drops. This volatility leaves those individuals vulnerable to events and, possibly, to long-term negative health outcomes (Cohen et al., 2005; Jacobs et al., 2007). It is unclear whether the short-term gain in decreased negative affect of low-self-esteem individuals can lead to long-term beneficial effects or whether this short-term gain is only a part of their reactivity cycle. This is an intriguing possibility that warrants further investigation.

In the present study we wanted to explore whether self-concept clarity would play a similar role to that of self-esteem. We did not find any significant moderating effects of self-concept clarity. This is consistent with prior research (Constantino et al., 2006). However, both our and Constantino et al.'s (2006) studies found a direct relation between self-concept clarity and adaptational outcomes. Future studies should explore alternate pathways through which self-concept clarity is implicated in the stress process. For example, M. C. Smith and Dust (2006) found that self-concept clarity is associated with coping choice.

Our examination of long-term outcomes demonstrated that higher levels of self-concept clarity were associated with lower levels of depressive symptoms at 2-year follow-up, controlling for initial levels of depressive symptoms and self-esteem. The interaction between self-esteem and self-concept clarity was also significantly associated with change in depressive symptoms over time. The negative relation between self-concept clarity and depressive symptoms tended to hold only for those with average or lower levels of self-esteem. It is important to note that we controlled for T1 depressive symptoms in this analysis, and thus, results represent change in symptoms over a 2-year period. We found that those with a combination of average levels of self-esteem and relatively high self-concept clarity reported the largest decrease in depressive symptoms, even compared to those with a combination of high self-esteem and high self-concept clarity. Those who were high on both self-esteem and self-concept clarity showed little change in depressive symptoms. It is possible that high-self-esteem individuals who also have a clear sense of self are more stable emotionally over time. Individuals with average self-esteem and high self-concept

clarity may be more volatile in their affect. Our results represent findings over a 2-year cycle. Future work may look more closely at the temporal trajectory of symptoms as a result of different levels of self-esteem and self-concept clarity: Is change in symptoms over time beneficial or is stability of symptoms (especially at a low level) more favorable?

Our findings have implications for and potential to bridge two distinct predictive models of adaptational outcomes: models of stress and coping and theory on stable self-views. Stable self-views and, more specifically, self-esteem seem to provide a context within which both primary and secondary appraisals of stressors affect daily affect (see DeLongis & Holtzman, 2005).

The present study focused on cognitive appraisals and did not take into account other components of the stress process. A more complete examination would include the effect of self-views on cognitive appraisals, on resulting coping efforts, and on the effectiveness of the total process of dealing with stressful events. Studies with a daily process design enable researchers to follow individuals' attempts to cope with daily stressors as they unfold over time and further elucidate the potential moderating role of self-views.

Our results suggest that individuals with high self-esteem are less affected by negative cognitive appraisals. This finding indicates that self-esteem is a valuable resource especially for people coping with important daily stressors. Our findings regarding individuals with low self-esteem indicate that those individuals are particularly vulnerable. Low-self-esteem individuals reported greater negative affect when confronted with threatening and uncontrollable stressors, compared to high-self-esteem individuals. This finding suggests another pathway through which low-self-esteem individuals become at risk for negative outcomes. From the point of view of treatment, our findings suggest that individuals with low self-esteem could benefit from cognitive interventions focused on shifting the way they appraise stressors. Because our study focused on individuals living in stepfamilies, who often face frequent and threatening interpersonal circumstances, future research on self-esteem and daily cognitive appraisals in other populations is warranted.

Campbell and colleagues (Campbell, 1990; Campbell et al., 1996; Campbell & Fehr, 1990; see also Baumgardner, 1990; Heimpel et al., 2002; Tice, 1993; Wood, Giordano-Beech, Taylor, Michela, & Gaus, 1994) have demonstrated that although high-self-esteem individuals have clearly articulated, positive beliefs about the self, prototypical low-self-esteem individuals do not have clearly articulated, negative views about the self. Rather, the self-concepts of low-self-esteem individuals are better described as poorly articulated and evaluatively neutral; more important, they are characterized by high levels of uncertainty and temporal and situational instability and inconsistency. This description implies that an interaction between self-concept clarity and self-esteem may be a better explanation for the association between

self-esteem and adaptational outcomes. In accordance with Campbell's description, our findings indicated that for high-self-esteem individuals, level of self-concept clarity did not seem to make a difference in terms of resulting depressive symptoms. However, as self-esteem decreased, individuals with a better defined self-concept reported fewer depressive symptoms than those with a more vaguely defined self-concept.

A relevant self-related variable that has attracted considerable attention is stability of self-esteem. Researchers (Franck & De Raedt, 2007; Kernis et al., 2000; Roberts & Kassel, 1997) have demonstrated that stability of self-esteem has validity in predicting outcomes. Although it appears there is some conceptual overlap between the constructs of self-concept clarity and stability of self-esteem, it is important to keep in mind that perceptions of self-esteem are only *part* of the body of perceptions of the self-concept. Certainly, stability in *other* aspects of the self-concept is likely included in the construct of self-concept clarity. More research on the relation among level of self-esteem, stability of self-esteem, and self-concept clarity is needed. For example, studies can look at the possibility that if one has ill-defined and unstable beliefs about the self (low self-concept clarity), this might cause any positive judgments held about the self (self-esteem) to become unstable (unstable self-esteem), and vice versa.

Baumeister et al. (2003) observed that studies on self-esteem and adaptational outcomes that rely solely on self-report tend to yield higher correlations than studies that include alternate methodologies to obtain information on adaptational outcomes. Common method seems to inflate those correlations in between-subject designs. Although the present study relied solely on self-report measures, the use of a within-subject design allowed us to hold individual differences stable and thus limit the potential impact of common method. We were able to study whether self-esteem and self-concept clarity influence outcomes on days when stress appraisals are more unfavorable relative to other days within a single individual. A within-subject design is thus another way of limiting inflated correlations between stable self-views and adaptational outcomes.

The present study concentrated on a single, albeit important, interpersonal stressor, and thus we cannot generalize our results to other stressors people may face in their daily life. Because we focused on a single stressor and because people are confronted with multiple stressors in their daily lives (Van Eck et al., 1998), we may not have comprehensively captured a person's stress experience and appraisal. However, daily stressors with the greatest impact on mood and health are often interpersonal in nature (Bolger et al., 1989), and a number of researchers have found that interpersonal factors have a strong influence on every aspect of the stress and coping process (Taylor, Repetti, & Seeman, 1997).

It is common practice to use brief versions of original scales in daily process studies, as it reduces the otherwise

prohibitive burden placed on participants (Bolger, Davis, & Rafaeli, 2003; Tennen, Affleck, Coyne, Larsen, & DeLongis, 2006). Nevertheless, the present study's smaller or unexpected effects might be attributed to the potentially compromised reliability and validity of using brief scales for our daily measures of cognitive appraisals and negative affect. However, it should be noted that, although brief, our measures demonstrated satisfactory internal reliability.

In summary, findings from the present study suggest that self-esteem and self-concept clarity have distinct, yet complementary, roles in the stress process. At a proximate level, self-concept clarity, independent of self-esteem, is associated with average levels of evening negative affect over 1 week, and self-esteem attenuates the relation between cognitive appraisals and subsequent evening negative affect. This moderation suggests that one pathway through which self-esteem has beneficial effects on adjustment is via cognitive appraisals. At a long-term level, self-esteem and self-concept clarity have a synergistic effect in predicting depressive symptoms 2 years later. Our findings are an initial step toward mapping out how self-views affect the process of adaptation to stress in both the short and long term.

Authors' Note

The first two authors have contributed equally to the current study. We would like to thank Jennifer Campbell for her contributions at an earlier phase of this research.

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The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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Notes

1. The interaction between self-esteem and self-concept clarity was initially specified in this model, but it was not a significant predictor, so it was subsequently dropped from the analyses in accordance with multilevel modeling specifications.
2. We repeated the analyses without the mean terms of stressor threat and controllability, and results remained unchanged.
3. We repeated the analyses with positive affect (calm, happy, excited) as the dependent variable. We found no significant relations.
4. Initially, two-level hierarchical linear models (HLM2) were specified in which both intercepts and slopes were specified as random. However, to get models to converge, it was necessary

to fix the slope coefficients and the intercepts (Nezlek, 2001; Raudenbush & Bryk, 2002). The final HLM2 models were fixed-effects models. A fixed-effects model was not specified a priori because we do not consider this participant sample, or the time frame from which the daily diary was drawn, to be special and not generalizable to the larger population of people and days, respectively. Nevertheless, it was statistically necessary to fix the coefficients to get the models to converge.

5. All models predicting evening negative affect (NA_{PM}) or Time 2 depression symptoms that included the main effects of self-esteem and self-concept clarity were run with only self-esteem or with only self-concept clarity to confirm that patterns of statistical significance were not due to a high positive correlation ($r = .65$) between those two variables. All results remained unchanged.
6. In all models that included an interaction between a predictor and either self-esteem or self-concept clarity, we examined the possibility that those interactions were significant because of a quadratic term of self-esteem or self-concept clarity. The squared terms were not significant predictors of either NA_{PM} or Time 2 depression symptoms.

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