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### Vulnerability-specific stress generation: an examination of depressogenic cognitive vulnerability across multiple domains

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## Vulnerability-specific stress generation: an examination of depressogenic cognitive vulnerability across multiple domains

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**Background and Objectives:** Although there is supporting evidence for the stress generation hypothesis (i.e., the tendency for depression-prone individuals to experience more negative dependent events influenced by their behaviors and characteristics), additional research is required to advance current understanding of the specific types of dependent events relevant to this effect. The present study elaborated on the stress generation hypothesis, in which the content of negative dependent events experienced by individuals is contingent upon, and matches, the nature of their particular vulnerabilities. This extension was tested within the context of Cole's competency-based model of depression. **Design:** Participants ( $n = 185$ ) were assessed at two time-points separated by a four-month interval. **Methods:** Self-perceived competence in academic, social, and appearance domains at the initial time-point were examined in relation to negative life events prospectively occurring over the four-month follow-up period, assessed using the "contextual threat" method. **Results:** Partial support was obtained for vulnerability-specific stress generation. Stress-generation specificity was found for self-perceived competence in appearance and academic domains, but not for self-perceived social competence. **Conclusions:** The current findings are consistent with the possibility of a more complex relation between self-perceived social competence and domain-congruent stress generation. Individuals may be more likely to experience negative dependent events in domains matching their specific vulnerabilities.

**Keywords:** cognitive vulnerability; depression; negative life events; schema; stress generation

### Introduction

Although an extensive body of research has established that negative life events significantly increase the risk for developing depression (see Hammen, 2005; Kessler, 1997; Paykel, 2003 for reviews), relatively recently, researchers also have given theoretical and empirical consideration to the possibility of a more complex, transactional relation between negative life events and depression. According to Hammen's (1991) stress generation hypothesis, individuals vulnerable to depression are not simply passive respondents to negative life events, but active agents whose depressogenic characteristics may influence the generation of some of these life events. That is, depression-prone

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individuals are likely to experience higher rates of negative dependent events (i.e., events to which are at least partly influenced by their own behaviors and characteristics), particularly within interpersonal domains, but not independent or fateful events (i.e., events outside their control). As negative dependent events, when compared to independent ones, may be more predictive of depression (Hammen, Marks, Mayol, & DeMayo, 1985; Kendler, Karkowski, & Prescott, 1999), the generation of negative dependent events, in turn, may potentially maintain current depression or increase the likelihood of subsequent depression onset and recurrence (Hammen, 1991; Joiner, Wingate, & Otamendi, 2005b). Thus, stress generation, in some measure, may account for the often chronic course of depression (Belsher & Costello, 1988; Solomon et al., 2000).

Support for the stress generation perspective has been found in both clinical samples (Hammen, 1991; Hammen, Shih, & Brennan, 2004) and non-clinical samples (Joiner, Wingate, Gencoz, & Gencoz, 2005a; Kercher & Rapee, 2009). The consistent emerging trend is that depressed or depression-prone individuals are significantly more likely to experience high rates of negative events, and that this effect is specific to dependent ones rather than independent life events (see Liu, 2013, for a review).

Depression alone, however, does not adequately account for the stress generation phenomenon, as heightened rates of negative dependent events have been found to occur during depressive remission (Hammen, 1991; Hammen & Brennan, 2002). Indeed, maladaptive behaviors and characteristics (e.g., cognitive styles, personality traits, attachment styles) of the individual have been hypothesized to have a role in stress generation (Hammen, 1991, 2006). Several researchers have found support for this possibility with depressogenic cognitive styles (e.g., Joiner et al., 2005a, 2005b; Kercher & Rapee, 2009; Safford, Alloy, Abramson, & Crossfield, 2007; Shih, Abela, & Starrs, 2009).

Despite this support for the role of cognitive vulnerability characteristics in stress generation, further research is required to tease apart the specific components of these constructs that are relevant to the stress generation effect. An interesting possibility not yet adequately explored is that the content or domains of negative dependent events may match an individual's particular vulnerabilities. That is, differences in vulnerabilities may predict different patterns of negative dependent events. For example, two individuals, differing in terms of cognitive vulnerability, may experience high rates of negative dependent events that are relatively distinct from the other's in content, but each consistent with their own underlying vulnerability. An examination of this possibility may help to address the need to extend beyond the broad approach of focusing on *overall* rates of negative life events toward more refined analyses involving *domains* of life events in relation to depressogenic risk factors (Shahar, Joiner, Zuroff, & Blatt, 2004); such an approach may help to clarify the specific type of negative dependent events involved in stress generation (Hammen, 2006). Moreover, this elaboration of the stress generation effect may enhance our understanding of its possible role in the onset, maintenance, and recurrence of depression; insofar as specificity in the match between negative dependent events and underlying vulnerability is important in placing individuals at significantly greater likelihood for developing depression (i.e., event congruency hypothesis; Beck, 1983), those who are more likely to experience the very life events specific to their vulnerability represent a particularly high risk group.

Relevant to this elaboration of stress generation are a few preliminary stress generation studies involving personality traits, such as sociotropy and autonomy. According to Beck's (1983) formulation of these two constructs, highly sociotropic

individuals' sense of self-worth is unduly dependent on interpersonal interactions, making them especially sensitive to criticism and rejection from others, whereas highly autonomous individuals' self-worth is heavily based on independence and goal attainment, making them, in turn, susceptible to depression when confronted with loss of control or personal failure. Interestingly, in a sample of adolescent women, Nelson, Hammen, Daley, Burge, and Davila (2001) reported a general mismatch between personality style and chronic stress. Specifically, the autonomy subscale of need for control predicted increases in chronic interpersonal stress over an 18-month period, whereas sociotropy interacted with poor problem solving or poor self-evaluations of interpersonal competence to predict increases in chronic achievement stress. In contrast, Shih (2006) found that, over a six-week period, sociotropy predicted higher episodic dependent interpersonal stress in women but not men, and neither sociotropy nor autonomy predicted episodic dependent achievement stress. In a third study focusing on the constructs of dependency and self-criticism, these two variables were found to be associated in women with prospective increases in the matching domains of romantic and academic stress, respectively, over a two-week period (Mongrain & Zuroff, 1994). For men, however, although self-criticism failed to predict the frequency of negative life events, dependency predicted higher rates of academic stress and marginally higher levels of stress in romantic relationships. These mixed results, in some measure, may be due to the short duration of and reliance on self-report measures of life stress in one study (Mongrain & Zuroff, 1994; see Blaney, 1986 and Hammen, 2005 for discussions of mood-congruent subjective biases in self-report measures of life events), and the differing focus between studies on chronic (Nelson et al., 2001) and episodic stress (Mongrain & Zuroff, 1994; Shih, 2006). Nevertheless, they collectively highlight the need for further research. Finally, in a more recent stress generation study (Conway, Hammen, & Brennan, 2012), internalizing and externalizing forms of psychopathology were found to be related to different types of dependent stress. Specifically, internalizing psychopathology was generally related to interpersonal dependent stressors, whereas externalizing psychopathology was generally more predictive of non-interpersonal dependent stressors. These findings are consistent with the possibility that the types of stress involved in stress generation may differ depending upon the nature of an individual's underlying vulnerability.

The purpose of the present study was further to assess the possibility of vulnerability-specific stress generation based on cognitive vulnerability characteristics. Cole's (1990, 1991) competency-based model of depression in children and adolescents offers a promising theoretical framework in which to evaluate this possibility. This model suggests that an individual's cognitive self-schemata, in the form of self-perceived competencies in various domains, develop during childhood, and that the construction of these self-schemata is influenced by information in the child's environment, especially evaluative feedback from others (e.g., teachers and peers). Negative life events, particularly in terms of competency feedback, negatively affect the formation of children's self-perceptions, which in turn increase their risk for depression. This mediational model has received considerable empirical support (e.g., Cole, Martin, & Powers, 1997; Tram & Cole, 2000).

Within the context of the present study, Cole's (1990, 1991) competency-based model allows for several interesting possibilities. First, as of yet, only one study has considered whether this model may in part account for the stress generation effect. In this study (Starrs et al., 2010), an association was observed between cognitive vulnerability in the

form of low self-perceived competence, as conceptualized by Cole (1990, 1991), and stress generation in Chinese adolescents. This relation was not better accounted for by a history of clinical depression and current depression symptom severity, suggesting that low self-perceived competence uniquely predicted greater stress generation. Although this finding is important in supporting the need for more research in this area, only overall self-perceived competence rather than within specific domains was assessed in relation to stress generation. In acknowledging the multidimensional nature of self-concept (Wylie, 1974), Cole's (1990, 1991) competency-based model of depression conceptualizes self-perceived competency in a similarly multifaceted manner. Several studies have provided support for this multidimensional view of self-competency (Cole, 1991; Seroczynski, Cole, & Maxwell, 1997). Thus, this model offers a useful framework in which to evaluate the vulnerability-specific extension of stress generation. To the extent that separate domains of self-perceived competence constitute distinct aspects of cognitive vulnerability, and to the extent that depressogenic cognitive schemata influence the manner in which an individual navigates their environment, as well as the negative life events they might encounter, it would not be unreasonable to suspect that negative self-appraisal of competence in a specific domain will be associated with the generation of more congruent negative dependent events than incongruent ones (Beck, 1983; Monroe & Simons, 1991). Several different processes may account for this possibility. For example, based on the literature on self-fulfilling prophecies (e.g., Kuklinski & Weinstein, 2001), individuals with a low self-concept in a given domain may act in ways that ultimately confirm their self-expectations and maintain their self-schemata. Suggestive of this possibility, prior research has found that rejection-sensitive individuals unknowingly behave in ways that tend to bring about the rejection they fear (Downey, Freitas, Michaelis, & Khouri, 1998). Another possibility is that low self-perceived competence causes anxiety relating to performance within that domain, resulting in poorer actual domain-related performance (Lang & Lang, 2010). Additionally, self-perceived competence has been found to predict domain-relevant task enjoyment (Harackiewicz & Larson, 1986). It may be that this lack of enjoyment, and resultant decreased motivation and persistence, leads to a greater probability of negative outcomes within the relevant domain.

Finally, although Cole's (1990, 1991) model has been extensively studied in youth, only two studies (Uhrlass & Gibb, 2007; Uhrlass, Schofield, Coles, & Gibb, 2009) have assessed it in adults. Although these two studies are important in providing a preliminary examination of the relation between negative life events and cognitive vulnerabilities, both featured a self-report measure of life events. Although these studies do not differ in this approach from previous ones examining negative life events within the context of Cole's (1990, 1991) model in children, self-report life events checklists may be susceptible to reporting biases reflecting underlying vulnerabilities (e.g., mood-congruent response bias; Brown & Harris, 1978; for further discussion on this point, see Hammen, 2005; Monroe & Reid, 2008). In addition to being relatively more immune to subjective reporting biases, interviews, particularly those using a "contextual threat" approach (Brown & Harris, 1978), are especially important to the study of stress generation insofar as they provide the contextual information necessary for accurately rating dependence/independence for each event and possible related ambiguity (e.g., did an individual change schools after being expelled from the previous one or because the family has moved?).

### ***The present study***

The current study examined the specificity of the relation between depressogenic vulnerability characteristics in the form of self-perceived domain-specific competence, and prospectively occurring negative life events. It was hypothesized that low self-perceived competence would predict prospectively occurring negative dependent, but not independent, events. To assess the vulnerability-specific stress generation model, the second hypothesis was that low self-perceived competence within a given domain would better predict matching negative dependent events than would other vulnerability domains.

## **Method**

### ***Participants***

Participants were recruited from the undergraduate population through psychology courses and flyers posted in the campus community of a public university in the northeastern United States. Participants received either research credits in partial fulfillment of their class research requirements or a small monetary compensation for their participation. Of the 203 participants who completed baseline (Time 1) assessment, 185 (91%) completed the follow-up phase (Time 2) of the study and constitute the final sample. A series of independent samples *t* tests and chi-square tests was conducted to assess potential differences between those who dropped out of the study and those who did not on demographic and baseline study variables (i.e., age, gender, ethnicity, depression symptoms, as well as self-perceived competence in academic, social, and appearance domains). Relative to those who remained in the study, those who dropped out scored lower on Time 1 depression symptoms ( $t = 2.167, p < .05, d = .30$ ). The demographic and descriptive statistics for participants who completed Time 2 are presented in [Table 1](#).

### ***Measures***

#### ***Depression symptoms***

The Beck Depression Inventory II (BDI-II; Beck, Brown, & Steer, 1996) is a 21-item self-report questionnaire used to assess baseline depressive symptoms, with higher scores indicating greater severity. The BDI-II has been shown to have high internal consistency ( $\alpha = .89$ ; Whisman, Perez, & Ramel, 2000), and test-retest reliability (Beck et al., 1996). The internal consistency was similarly found to be good in the current sample ( $\alpha = .89$ ).

#### ***History of clinical depression***

The Schedule for Affective Disorders and Schizophrenia-Lifetime version (SADS-L; Endicott & Spitzer, 1978) is a widely used semi-structured diagnostic interview for lifetime history of Axis I psychopathology, and has demonstrated high inter-rater reliability (Endicott & Spitzer, 1978). For the current study, an expanded version of the SADS-L (Alloy et al., 2000) was used to allow for the assessment of Diagnostic and Statistical Manual IV - Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000) diagnoses of depression. The expanded SADS-L was administered by research assistants and graduate students in clinical psychology who had received extensive training in diagnostic interviewing, including didactic instruction, role-playing, and observation and practice of live interviews. The expanded SADS-L has demonstrated



Table 1. Demographic and descriptive characteristics of the sample.

Variable	<i>N</i>	%	<i>M (SD)</i>
Gender (female)	140	75.7	
<i>Ethnicity</i>			
Caucasian	104	56.2	
African-American	44	23.8	
Asian-American	23	12.4	
Latino-American	9	4.9	
Other	5	2.7	
Age (years)			19.65 (1.49)
Education (years)			13.19 (1.02)
<i>Depression</i>			
Time 1 BDI-II			8.19 (7.15)
Time 1 history of depression	43	23.2	
<i>Cognitive vulnerability characteristics</i>			
Self-perceived competence in academic domain			11.96 (2.62)
Self-perceived competence in social domain			12.45 (2.85)
Self-perceived competence in appearance domain			11.09 (2.88)
<i>Negative life events<sup>a</sup></i>			
Negative independent events	89	48.1	
Negative dependent events	156	84.3	
Dependent events in academic domain	103	55.7	
Dependent events in social domain	139	75.1	
Dependent events in appearance domain	29	15.7	

BDI-II = Beck Depression Inventory II.

<sup>a</sup>Values are the percentage of participants who experienced at least one event for each subtype.

high inter-rater reliability ( $\kappa \geq .90$ ; Alloy et al., 2000) for depression diagnoses. Within the current sample, 23.2% had a lifetime history of depression. This lifetime prevalence rate is comparable to what has been reported in a previous study utilizing the same recruitment source (28.9% in a low cognitive risk subgroup; Alloy et al., 2000) and in another study utilizing a similar undergraduate sample (28.3%; Carver, Johnson, & Joormann, 2013).

### *Self-perceived competence*

The Self-Perception Profile for College Students (SPPCS; Neeman & Harter, 1986) is a self-report measure of global self-worth and self-perceived competence in 12 domains relevant to college-aged students. In the current study, only three of the domain-specific scales were included (i.e., academic competence, social competence, and physical appearance), chosen specifically because of their correspondence to scales in the Self-Perception Profile for Children (SPPC; Harter, 1985) and the Self-Perception Profile for Adolescents (SPPA; Harter, 1988). These scales on the SPPC and SPPA have been widely used in previous research on Cole's (1990, 1991) competency-based model of depression (e.g., Seroczynski et al., 1997; Tram & Cole, 2000). Items are scored on a 4-point Likert scale, with higher total scores reflecting higher self-perceived competence. The SPPCS has demonstrated high reliability and validity (Neeman & Harter, 1986; Uhrlas & Gibb, 2007). In the current sample, internal consistency for each subscale was adequate ( $\alpha = .82$  for academic competence, .82 for social competence and .84 for physical appearance).



*Negative life events*

The Life Events Scale (LES; Safford et al., 2007) and Life Events Interview (LEI; Safford et al., 2007) are a combination of questionnaire and semi-structured interview designed to assess the occurrence of negative life events spanning a wide range of content domains relevant to college students (e.g., school, family, relationships, finances). The LES included 14 items in the academic domain, 15 items in the social domain, and 7 items in the appearance domain. In addition to indicating whether an item event occurred, participants were instructed to indicate the number of occurrences for the item event over the period assessed. This allowed for the capturing of multiple distinct events for any given item (e.g., ending multiple friendships). The LES and LEI were used in the current study to assess negative life events that occurred prospectively between Time 1 and Time 2, four months later. Life events with onsets prior to Time 1 were excluded from analysis. This four-month follow-up interval was chosen based on previous findings that recollection of non-severe life events tend to become less reliable after about half a year (Brown & Harris, 1982), while also being of sufficient duration to allow for meaningful variability in the occurrence of negative life events under consideration, particularly within the academic domain (e.g., finals).

Following completion of the LES, participants were interviewed with the LEI by a trained research assistant or graduate student. The LEI was adapted in the current study to be based on the “contextual threat” method (Brown & Harris, 1978), and serves as a reliability and validity check on the LES, as it allows for life events to be more objectively identified in order to reduce potential subjective report biases. The LEI includes explicit criteria for event definition and a priori probes to help the interviewer determine whether reported events on the LES meet the event definition criteria. Specifically, a written narrative was generated for each endorsed event on the LES by probed for objective information regarding the circumstances surrounding its occurrence, as well as its timing, duration, and consequence. Endorsed events for which there were concrete criterial indicators of their occurrence (e.g., receiving a failing grade on a report card) qualified as a life event, whereas endorsed events that were more subjective in nature (e.g., the subjective impression that one has failed an exam) were excluded. Any events that did not meet the event definition criteria were disqualified, as were events that occurred prior to the initial study visit.

In addition to allowing for a determination of the objective impact of individual events, separate from participants’ subjective interpretation and response, the contextual information derived from the interview was separately coded by three raters blind to participants’ diagnoses, depression symptoms, and vulnerabilities. Following Brown and Harris’s (1978) approach, raters coded individual events in terms of their objective impact on a three-point scale (*0 = mild/minimal; 1 = moderate; 2 = major*) for the amount of objective impact it would have on most people in the same circumstances. Events with ratings of one or more were dichotomized as non-mild. As non-mild events were the primary focus of the current study, objective impact ratings served as a means of identifying and screening out mild events (i.e., hassles) that had been endorsed. Thus, mild events were excluded from all analyses. Raters also coded individual events in terms of independent versus dependence on a three-point scale (*1 = mostly independent of participant; 2 = at least partly dependent on participant; 3 = mostly dependent on participant*). Events with ratings of two or more were dichotomized as dependent.

Past studies have found the LES and LEI to exhibit good reliability and validity (Needles & Abramson, 1990; Safford et al., 2007). In the current study, inter-rater reliabilities (i.e., intra-class correlations) were .87 for dependence ratings and .85 for objective impact ratings.

### **Procedure**

Participants were assessed at two time-points, separated by four months ( $M = 117.28$  days,  $SD = 9.67$ ). During the initial assessment at Time 1, they completed the BDI-II and SPPCS. At the follow-up assessment at Time 2, participants completed the LES, and they also completed two semi-structured interviews: LEI and SADS-L.

### **Data analysis**

Evaluation of the general stress generation hypothesis was conducted with a series of logistic regression analyses in which overall negative dependent and independent events, respectively, were regressed on to self-perceived competence in academic, social, and appearance domains, with gender, Time 1 BDI-II scores, and past history of clinical depression covaried. To examine whether self-perceived competence within a given domain would better predict domain-congruent negative dependent events than would self-perceived competence in other domains, three sequential logistic regression analyses were conducted. Gender, Time 1 BDI-II scores, and history of clinical depression were entered as covariates, and cognitive vulnerabilities incongruent with the negative dependent events domain of interest were entered as the predictor variables in Step 1, with domain-specific negative dependent events as the criterion variable. The domain-congruent cognitive vulnerability was then entered as the predictor in Step 2.

## **Results**

### **Preliminary analyses**

Correlations among the main study variables are presented in Table 2. Consistent with a multidimensional conceptualization of self-perceived competence (Cole, 1990, 1991; Seroczynski et al., 1997; Wylie, 1974), self-perceived competence in the academic domain was not significantly correlated with self-perceived competence in social ( $r = .122$ ,  $p = .099$ ) or appearance domains ( $r = .121$ ,  $p = .103$ ). Additionally, self-perceived competence in social and appearance domains were only moderately correlated with each other ( $r = .317$ ,  $p < .001$ ).

As Time 1 BDI-II scores were positively skewed, they were submitted to a square root transformation to satisfy assumptions of normality. To account for potential stress generation effects associated with depression itself, Time 1 BDI-II scores and past history of clinical depression were covaried in all analyses. As female gender has similarly been associated with stress generation (Liu & Alloy, 2010; Shih, 2006), gender was also treated as covariate in the analyses. Additionally, to account for the relative low rate of domain-specific negative events, all independent and dependent event variables were dichotomized by occurrence versus non-occurrence.

Table 2. Summary of intercorrelations between main study variables.

Variable	1	2	3	4	5	6	7	8	9	10
1. Female gender	—									
2. Time 1 BDI-II	.033	—								
3. Time 1 history of depression	-.016	.106	—							
4. SPPCS – academic domain	.058	-.349***	-.021	—						
5. SPPCS – social domain	-.035	-.319***	-.067	.122	—					
6. SPPCS – appearance domain	-.115	-.236***	-.071	.121	.317***	—				
7. Negative independent events	.067	.145*	.136	-.067	-.056	-.037	—			
8. Negative dependent events – Overall	.033	.273***	.202**	-.218**	-.011	-.003	.147*	—		
9. Negative dependent events – academic	-.151*	.325***	.130	-.287***	-.075	-.064	.075	.483***	—	
10. Negative dependent events – social	.111	.222**	.169*	-.173*	-.029	-.035	.153*	.749***	.242***	—
11. Negative dependent events – appearance	.071	.311***	.150*	-.118	-.078	-.221**	.150*	.186*	.205**	.145*

Note: Spearman correlations are reported for history of clinical depression and Pearson correlations for all remaining variables.

BDI-II = Beck Depression Inventory II; SPPCS = Self-Perception Profile for College Students.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

### ***Test of the general stress generation hypothesis***

Low self-perceived competence in the academic ( $OR = .814$ , 95%  $CI = .668-.992$ ), but not in the social ( $OR = 1.088$ , 95%  $CI = .917 - 1.291$ ) or appearance ( $OR = 1.104$ , 95%  $CI = .927-1.315$ ) domains, predicted overall negative dependent events. None of the self-perceived competence domains predicted prospectively occurring negative independent events (for academic competence,  $OR = .980$ , 95%  $CI = .868-1.107$ ; for social,  $OR = .997$ , 95%  $CI = .889-1.118$ ; and for appearance,  $OR = 1.012$ , 95%  $CI = .905-1.131$ ).

Although, as detailed in Table 2, self-perceived social competence was only moderately correlated with self-perceived competence regarding appearance and not correlated with self-perceived academic competence, and there was no indication of multicollinearity based on Variance Inflation Factors (VIFs), suppressor effects were observed in both regression analyses (for more details regarding suppressor variables, see Cohen & Cohen, 1983; Tabachnick & Fidell, 1996; Tzelgov & Avishai, 1991). Specifically, self-perceived social and appearance competence were negatively correlated at the bivariate level with overall negative dependent events, but had positive associations in the regression model with overall negative dependent events as the criterion variable. To assess the degree to which the observed suppressor effects affected our outcomes, the analysis with negative dependent events as the criterion variable was repeated with self-perceived social and appearance competence separated out of the regression model (see Gibb et al., 2006; Liu, Jager-Hyman, Wagner, Alloy, & Gibb, 2012, for prior research similarly addressing suppressor effects). The results for low self-perceived academic competence remained essentially unchanged. When suppressor effects were separated out of the model assessing self-perceived social and appearance competence as a predictor of overall negative dependent events, respectively, both nonetheless remained non-significant predictors.

A suppressor effect was also observed in the analysis with negative independent events as the outcome variable. Specifically, self-perceived competence in the appearance domain was negatively correlated at the bivariate level with negative independent events, but had a positive association in the regression model with negative independent events as the criterion variable. Even after addressing the suppressor effect for this predictor, the results remained essentially unchanged.

### ***Test of stress generation specificity between domains of cognitive vulnerability***

As detailed in Table 3, self-perceived competence in both academic and appearance domains predicted domain-congruent dependent events in the final regression models, indicating that both vulnerabilities of interest predicted domain-congruent negative dependent events over and above what could be accounted for by domain-incongruent vulnerabilities. In both cases, lower self-perceived competence was associated with more domain-congruent negative dependent events, and domain-incongruent self-perceived competence did not predict domain-specific negative dependent events in the full regression model. In contrast, however, self-perceived competence in the social domain was not predictive of subsequent domain-congruent negative dependent events. Self-perceived competence in the academic and appearance domains were similarly non-predictive of negative dependent events in the social domain.

Suppressor effects were also observed in the three regression analyses. Specifically, suppressor effects were evident for gender, and self-perceived competence in the social and appearance domains in the regression model with negative dependent events in the

Table 3. Cognitive vulnerability domains predicting domain-specific negative dependent and independent events.

	OR (95% CI)	<i>p</i>
<i>Predicting negative dependent events in academic domain</i>		
Step 1		
Female gender	.407 (.188–.880)	.022
Time 1 BDI-II	1.757 (1.336–2.311)	<.001
Time 1 history of depression	1.629 (.756–3.509)	.212
SPPCS – social domain	1.023 (.906–1.154)	.718
SPPCS – appearance domain	.995 (.882–1.121)	.930
Step 2		
Female gender	.427 (.195–.935)	.033
Time 1 BDI-II	1.606 (1.206–2.138)	.001
Time 1 history of depression	1.670 (.761–3.663)	.713
SPPCS – academic domain	.840 (.734–.961)	.011
SPPCS – social domain	1.023 (.904–1.158)	.713
SPPCS – appearance domain	1.001 (.885–1.133)	.981
<i>Predicting negative dependent events in social domain</i>		
Step 1		
Female gender	1.979 (.898–4.363)	.091
Time 1 BDI-II	1.349 (1.004–1.814)	.047
Time 1 history of depression	2.949 (1.049– 8.296)	.040
SPPCS – academic domain	.877 (.752–1.024)	.098
SPPCS – appearance domain	1.041 (.913–1.189)	.547
Step 2		
Female gender	1.997 (.904–4.410)	.087
Time 1 BDI-II	1.387 (1.019–1.887)	.038
Time 1 history of depression	2.991 (1.061–8.428)	.038
SPPCS – academic domain	.878 (.752–1.024)	.097
SPPCS – social domain	1.048 (.913–1.204)	.505
SPPCS – appearance domain	1.030 (.899–1.180)	.672
<i>Predicting negative dependent events in appearance domain</i>		
Step 1		
Female gender	1.775 (.590–5.343)	.307
Time 1 BDI-II	2.115 (1.421–3.147)	<.001
Time 1 history of depression	2.489 (.999–6.206)	.050
SPPCS – academic domain	.977 (.827–1.154)	.784
SPPCS – social domain	1.030 (.886–1.197)	.702
Step 2		
Female gender	1.528 (.499–4.680)	.458
Time 1 BDI-II	2.100 (1.399–3.154)	<.001
Time 1 history of depression	2.459 (.965–6.263)	.059
SPPCS – academic domain	.990 (.838–1.170)	.904
SPPCS – social domain	1.085 (.924–1.274)	.318
SPPCS – appearance domain	.835 (.711–.982)	.030

BDI-II = Beck Depression Inventory II; SPPCS = Self-perception Profile for College Students; OR = odds ratio; CI = confidence interval.

academic domain. To assess the degree to which the suppressor effects affected our analysis, the regression analysis with dependent events in academic domain as criterion variable was repeated with these predictors separated out. Similarly, suppressor effects were found for self-perceived social and appearance competence in the regression model with negative dependent events in the social domain. To address this issue, self-perceived appearance competence was separated out of this analysis. Finally, a suppressor effect was detected for self-perceived social competence in the regression model with negative dependent events in the appearance domain as the criterion variable. This predictor was removed from the model to ascertain whether it influenced the results. In all cases, the results remained essentially identical, suggesting that the observed suppressor effects did not have an effect on our findings.

## Discussion

The current study sought to test a conceptual extension of the stress generation hypothesis by examining whether specificity exists in the relation between depressogenic vulnerabilities and the negative dependent events that they generate. Additionally, it extended the stress generation literature by providing the first full test of this phenomenon within the framework of Cole's (1990, 1991) competency-based model of depression. It also offered the first assessment of Cole's (1990, 1991) model of depression using a rigorous interview-based measure of negative life events, and, as such, provided an important methodological advancement on prior studies.

As a preliminary step prior to examining the main study hypotheses, the general stress generation hypothesis was tested. Consistent with the stress generation hypothesis, we found that only low self-perceived academic competence prospectively predicted greater overall negative dependent, but not independent, events. In contrast, we found self-perceived competence within the social and appearance domains both failed to predict either overall negative dependent or independent events.

We also found partial support for the vulnerability-specific model of stress generation. That is, low self-perceived competence in academic and appearance domains prospectively predicted domain-congruent negative dependent events when covarying self-perceived competence in incongruent domains. Furthermore, in all cases, the domain-incongruent self-perceived competences were not predictive of negative dependent events in the domain of interest, after accounting for the effect of the domain-congruent self-perceived competence. This pattern of results was not found, however, for self-perceived social competence, which was not significantly predictive of prospectively occurring negative interpersonal events.

The failure to detect a stress generation effect with low self-perceived social competence, either in terms of general or domain-congruent negative dependent events, is curious, given the evidence of stress generation with the other self-perceived competence domains. Interestingly, this lack of finding for self-perceived social competence parallels recent research examining this same construct within the context of a stress-diathesis model of depression and Beck's (1983) event congruency hypothesis (Uhrlass & Gibb, 2007). In this study, self-perceived academic competence, but not self-perceived social competence, interacted with domain-congruent negative events to account for depression symptoms. Previous stress generation studies have also yielded mixed results. Mirroring the results of the current study, Segrin (2001) found little evidence of

a relation between self-perceived interpersonal competence and later negative interpersonal events. In contrast, Caldwell, Rudolph, Troop-Gordon, and Kim (2004) reported a relation between negative relational self-schemata, characterized as a composite of social self-worth and self-competence, and prospectively occurring negative peer-related interpersonal events. These results, however, also differed from findings from another study that found *high* self-perceived interpersonal competence to interact with trait hostility to predict greater daily negative dependent events (Sahl, Cohen, & Dasch, 2009).

Collectively, these findings suggest that if a relation between self-perceived social competence and stress generation does indeed exist, it is likely to be a complex one. One possibility is that the relation between self-perceived social competence and interpersonal stress generation may be non-linear in nature, with certain individuals with high and low social competence being at particular risk for stress generation, but for different reasons altogether. That is, individuals with low social competence may experience greater difficulty navigating social situations, resulting in greater interpersonal stressors. Individuals with high social competence, on the other hand, may also have more opportunity for interpersonal stressors as a product of having a wider social network, and thus, greater opportunity for social interactions. Perhaps very social and outgoing individuals who also possess certain other traits (e.g., hostility; Sahl et al., 2009) experience a facility in making new social connections, but also a difficulty in retaining them. Thus, more research is required before firm conclusions can be drawn regarding the potential role of self-perceived social competence in stress generation.

The current study is characterized by several strengths. Perhaps chief among them is the use of diagnostic and rigorous context-based life events interviews (for information regarding the importance of interview-based measures of diagnostic and life event data, as well as limitations inherent in self-report approaches, see Hammen, 2005; Liu, 2013; Monroe & Reid, 2008). Such context-based approaches, in addition to being generally viewed as the gold standard for assessing life stress (Hammen, 2005; Monroe, 2008), are especially invaluable for providing the contextual information necessary for accurately determining dependence/independence for events and resolving potentially related ambiguity (e.g., did a child change schools after being expelled from a previous one or because the family had moved?). Furthermore, interview-based methodologies focus on concrete and objective indicators of event occurrences, and are consequently relatively more immune than self-report checklists to subjective reporting biases (e.g., mood-congruent biases; Brown & Harris, 1978). Thus, our use of a life event interview allows for greater certainty that each event under consideration was an actual occurrence rather than the mere perception of it. Additionally, the four-month prospective interval was ideal in terms of mitigating memory biases and errors associated with more long-term recall (Brown & Harris, 1982), while also of sufficient duration to allow for meaningful variability in the occurrence of life events.

The present findings, however, must also be interpreted within the context of its limitations. First, the study sample was predominantly female, limiting the generalizability of the findings to males, and precluding the possibility of examining gender interactions. Given the evidence of a degree of gender specificity in stress generation (Liu & Alloy, 2010; Shih, 2006), this is an important consideration for future research. Just as there may be vulnerability processes specific to stress generation in females, it is important also to uncover processes specific to males (Shih, 2006). Second, although the present sample was diverse and a sizeable percentage had a history of depression,



additional research is required to replicate current findings with clinical samples. Third, and of particular clinical relevance, the current study provided only a partial assessment of the etiological chain underlying the chronicity of depression articulated in the stress generation hypothesis. Specifically, although cognitive vulnerabilities were assessed in relation to negative dependent events, the degree to which these events, in turn, precipitate future depressive episodes is unclear. As only one study to date has examined clinical depression as a pathological consequence of stress generation (Bos, Bouhuys, Geerts, van Os, & Ormel, 2007), there is a need for additional research to address this gap in the literature. Finally, the current study did not account for prior levels of negative life events at baseline in predicting prospectively occurring life events. For most psychological constructs, it would be meaningful to include a baseline assessment of the dependent variable, as it would be reasonable to expect some degree of continuity between assessment points. For example, one would expect baseline depression symptoms to predict some of the variance in symptoms at follow-up. Given our focus on stress generation (and thus the occurrence of discrete life events rather than subjective levels of stress), however, we did not include a baseline assessment of life events. This approach is consistent with several past stress generation studies (e.g., Daley et al., 1997; Hammen, 1991; Shih, 2006). Episodic life events differ from most psychological constructs in that they are discrete occurrences, having a relatively clear onset and offset (Hammen, 2005). In contrast, many other psychological constructs tend not to be so discrete, but rather may wax and wane. One would also reasonably not expect some life events to predict future recurrence (e.g., one relative passing away in the past should under most circumstances not predict another relative passing away in the future). For events that *are* predictive of future recurrences (e.g., getting into a conflict with one peer predicting a later conflict with another peer), we would argue that a third variable (e.g., aggression, maladaptive interpersonal styles) prospectively accounting for *both* events (i.e., stress generation) offers a more compelling explanation than that the first event in and of itself accounted for the future occurrence.

In terms of clinical implications of the current findings, they provide preliminary support for the importance of assessing depressogenic vulnerability and functioning in multiple domains within treatment settings. To the degree that subsequently generated negative dependent events are specific to vulnerability domain, negative dependent events within the congruent domain may provide a very clear and focused goal and measure of progress in treatment. In contrast to attempting to reduce the occurrence of negative dependent events more generally, this greater precision in prioritizing and targeting maladaptive cognitions and characteristics, and in measuring progress and therapeutic gains, allows for greater customization of treatment to patient-specific needs. Thus, the current extension of the stress generation model highlights the potential importance of similar specificity in identifying vulnerabilities and negative life events domains as targets and outcome measures of treatment and prevention efforts.

## References

- Alloy, L. B., Abramson, L. Y., Hogan, M., Whitehouse, W., Rose, D., Robinson, M., ... Lapkin, J. B. (2000). The temple-Wisconsin cognitive vulnerability to depression project: Lifetime history of Axis I psychopathology in individuals at high and low cognitive risk for depression. *Journal of Abnormal Psychology*, 109, 403–418. doi:10.1037/0021-843X.109.3.403

- American Psychiatric Association. 2000. *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Beck, A. T. (1983). Cognitive therapy of depression: New perspectives. In P. J. Clayton & J. E. Barrett (Eds.), *Treatment of depression: Old controversies and new approaches* (pp. 265–290). New York, NY: Raven Press.
- Beck, A. T., Brown, G., & Steer, R. A. (1996). *Beck depression inventory II manual*. San Antonio, TX: The Psychological Corporation.
- Belsher, G., & Costello, C. G. (1988). Relapse after recovery from unipolar depression: A critical review. *Psychological Bulletin*, 104, 84–96. doi:10.1037/0033-2909.104.1.84
- Blaney, P. H. (1986). Affect and memory: A review. *Psychological Bulletin*, 99, 229–246. doi:10.1037/0033-2909.99.2.229
- Bos, E. H., Bouhuys, A. L., Geerts, E., van Os, T. W. D. P., & Ormel, J. (2007). Stressful life events as a link between problems in nonverbal communication and recurrence of depression. *Journal of Affective Disorders*, 97, 161–169. doi:10.1016/j.jad.2006.06.011
- Brown, G. W., & Harris, T. O. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York, NY: Free Press.
- Brown, G. W., & Harris, T. O. (1982). Fall-off in the reporting of life events. *Social Psychiatry*, 17, 23–28. doi:10.1007/BF00583889
- Caldwell, M. S., Rudolph, K. D., Troop-Gordon, W., & Kim, D. Y. (2004). Reciprocal influences among relational self-views, social disengagement, and peer stress during early adolescence. *Child Development*, 75, 1140–1154. doi:10.1111/j.1467-8624.2004.00730.x
- Carver, C. S., Johnson, S. L., & Joormann, J. (2013). Major depressive disorder and impulsive reactivity to emotion: Toward a dual-process view of depression. *British Journal of Clinical Psychology*, 52, 285–299. doi:10.1111/bjc.12014
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cole, D. A. (1990). Relation of social and academic competence to depressive symptoms in children. *Journal of Abnormal Psychology*, 99, 422–429. doi:10.1037/0021-843X.99.4.422
- Cole, D. A. (1991). Preliminary support for a competency-based model of depression in children. *Journal of Abnormal Psychology*, 100, 181–190. doi:10.1037/0021-843X.100.2.181
- Cole, D. A., Martin, J. M., & Powers, B. (1997). A competency-based model of child depression: A longitudinal study of peer, parent, teacher, and self-evaluations. *Journal of Child Psychology and Psychiatry*, 38, 505–514. doi:10.1111/j.1469-7610.1997.tb01537.x
- Conway, C. C., Hammen, C., & Brennan, P. A. (2012). Expanding stress generation theory: Test of a transdiagnostic model. *Journal of Abnormal Psychology*, 121, 754–766. doi:10.1037/a0027457
- Daley, S. E., Hammen, C., Burge, D., Davila, J., Paley, B., Lindberg, N., & Herzberg, D. S. (1997). Predictors of generation of episodic stress: A longitudinal study of late adolescent women. *Journal of Abnormal Psychology*, 106, 251–259. doi:10.1037/0021-843X.106.2.251
- Downey, G., Freitas, A. L., Michaelis, B., & Khouri, H. (1998). The self-fulfilling prophecy in close relationships: Rejection sensitivity and rejection by romantic partners. *Journal of Personality and Social Psychology*, 75, 545–560. doi:10.1037/0022-3514.75.2.545
- Endicott, J., & Spitzer, R. A. (1978). A diagnostic interview: The schedule for affective disorders and schizophrenia. *Archives of General Psychiatry*, 35, 837–844. doi:10.1001/archpsyc.1978.01770310043002
- Gibb, B. E., Alloy, L. B., Walshaw, P. D., Comer, J. S., Shen, G. H. C., & Villari, A. G. (2006). Predictors of attributional style change in children. *Journal of Abnormal Child Psychology*, 34, 425–439. doi:10.1007/s10802-006-9022-2
- Hammen, C. (1991). The generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology*, 100, 555–561. doi:10.1037/0021-843X.100.4.555
- Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*, 1, 293–319. doi:10.1146/annurev.clinpsy.1.102803.143938
- Hammen, C. (2006). Stress generation in depression: Reflections on origins, research, and future directions. *Journal of Clinical Psychology*, 62, 1065–1082. doi:10.1002/jclp.20293
- Hammen, C., & Brennan, P. A. (2002). Interpersonal dysfunction in depressed women: Impairments independent of depressive symptoms. *Journal of Affective Disorders*, 72, 145–156. doi:10.1016/S0165-0327(01)00455-4

- Hammen, C., Marks, T., Mayol, A., & DeMayo, R. (1985). Depressive self-schemas, life stress, and vulnerability to depression. *Journal of Abnormal Psychology*, 94, 308–319. doi:[10.1037/0021-843X.94.3.308](https://doi.org/10.1037/0021-843X.94.3.308)
- Hammen, C., Shih, J. H., & Brennan, P. A. (2004). Intergenerational transmission of depression: Test of an interpersonal stress model in a community sample. *Journal of Consulting and Clinical Psychology*, 72, 511–522. doi:[10.1037/0022-006X.72.3.511](https://doi.org/10.1037/0022-006X.72.3.511)
- Harackiewicz, J. M., & Larson, J. R., Jr. (1986). Managing motivation: The impact of supervisor feedback on subordinate task interest. *Journal of Personality and Social Psychology*, 51, 547–556. doi:[10.1037/0022-3514.51.3.547](https://doi.org/10.1037/0022-3514.51.3.547)
- Harter, S. (1985). *Manual for the self-perception profile for children*. Denver, CO: University of Denver.
- Harter, S. (1988). *Manual for the self-perception profile for adolescents*. Denver, CO: University of Denver.
- Joiner, T. E., Jr., Wingate, L. R., Gencoz, T., & Gencoz, F. (2005a). Stress generation in depression: Three studies of its resilience, possible mechanism, and symptom specificity. *Journal of Social and Clinical Psychology*, 24, 236–253. doi:[10.1521/jscp.24.2.236.62272](https://doi.org/10.1521/jscp.24.2.236.62272)
- Joiner, T. E., Jr., Wingate, L. R., & Oatamendi, A. (2005b). An interpersonal addendum to the hopelessness theory of depression: Hopelessness as a stress and depression generator. *Journal of Social and Clinical Psychology*, 24, 649–664. doi:[10.1521/jscp.2005.24.5.649](https://doi.org/10.1521/jscp.2005.24.5.649)
- Kendler, K. S., Karkowski, L. M., & Prescott, C. A. (1999). Causal relationship between stressful life events and the onset of major depression. *American Journal of Psychiatry*, 156, 837–848.
- Kercher, A., & Rapee, R. M. (2009). A test of a cognitive diathesis-stress generation pathway in early adolescent depression. *Journal of Abnormal Child Psychology*, 37, 845–855. doi:[10.1007/s10802-009-9315-3](https://doi.org/10.1007/s10802-009-9315-3)
- Kessler, R. C. (1997). The effects of stressful life events on depression. *Annual Review of Psychology*, 48, 191–214. doi:[10.1146/annurev.psych.48.1.191](https://doi.org/10.1146/annurev.psych.48.1.191)
- Kuklinski, M. R., & Weinstein, R. S. (2001). Classroom and developmental differences in a path model of teacher expectancy effects. *Child Development*, 72, 1554–1578. doi:[10.1111/1467-8624.00365](https://doi.org/10.1111/1467-8624.00365)
- Lang, J. W. B., & Lang, J. (2010). Priming competence diminishes the link between cognitive test anxiety and test performance: Implications for the interpretation of test scores. *Psychological Science*, 21, 811–819. doi:[10.1177/0956797610369492](https://doi.org/10.1177/0956797610369492)
- Liu, R. T. (2013). Stress generation: Future directions and clinical implications. *Clinical Psychology Review*, 33, 406–416. doi:[10.1016/j.cpr.2013.01.005](https://doi.org/10.1016/j.cpr.2013.01.005)
- Liu, R. T., & Alloy, L. B. (2010). Stress generation in depression: A systematic review of the empirical literature and recommendations for future study. *Clinical Psychology Review*, 30, 582–593. doi:[10.1016/j.cpr.2010.04.010](https://doi.org/10.1016/j.cpr.2010.04.010)
- Liu, R. T., Jager-Hyman, S., Wagner, C. A., Alloy, L. B., & Gibb, B. E. (2012). Number of childhood abuse perpetrators and the occurrence of depressive episodes in adulthood. *Child Abuse & Neglect*, 36, 323–332. doi:[10.1016/j.chiabu.2011.11.007](https://doi.org/10.1016/j.chiabu.2011.11.007)
- Mongrain, M., & Zuroff, D. C. (1994). Ambivalence over emotional expression and negative life events: Mediators and moderators of depressive symptoms in dependent and self-critical individuals. *Personality and Individual Differences*, 16, 447–458. doi:[10.1016/0191-8869\(94\)90071-X](https://doi.org/10.1016/0191-8869(94)90071-X)
- Monroe, S. M. (2008). Modern approaches to conceptualizing and measuring human life stress. *Annual Review of Clinical Psychology*, 4, 33–52. doi:[10.1146/annurev.clinpsy.4.022007.141207](https://doi.org/10.1146/annurev.clinpsy.4.022007.141207)
- Monroe, S. M., & Reid, M. W. (2008). Gene–environment interactions in depression research. *Psychological Science*, 19, 947–956. doi:[10.1111/j.1467-9280.2008.02181.x](https://doi.org/10.1111/j.1467-9280.2008.02181.x)
- Monroe, S. M., & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: Implications for the depressive disorders. *Psychological Bulletin*, 110, 406–425. doi:[10.1037/0033-2909.110.3.406](https://doi.org/10.1037/0033-2909.110.3.406)
- Needles, D. J., & Abramson, L. Y. (1990). Positive life events, attributional style, and hopelessness: Testing a model of recovery from depression. *Journal of Abnormal Psychology*, 99, 156–165. doi:[10.1037/0021-843X.99.2.156](https://doi.org/10.1037/0021-843X.99.2.156)
- Neeman, J., & Harter, S. (1986). *Manual for the self-perception profile for college students*. Unpublished manuscript, University of Denver.

- Nelson, D. R., Hammen, C., Daley, S. E., Burge, D., & Davila, J. (2001). Sociotropic and autonomous personality styles: Contributions to chronic life stress. *Cognitive Therapy and Research*, 25, 61–76. doi:[10.1023/A:1026426832222](https://doi.org/10.1023/A:1026426832222)
- Paykel, E. S. (2003). Life events and affective disorders. *Acta Psychiatrica Scandinavica*, 108, 61–66. doi:[10.1034/j.1600-0447.108.s418.13.x](https://doi.org/10.1034/j.1600-0447.108.s418.13.x)
- Safford, S. M., Alloy, L. B., Abramson, L. Y., & Crossfield, A. G. (2007). Negative cognitive style as a predictor of negative life events in depression-prone individuals: A test of the stress generation hypothesis. *Journal of Affective Disorders*, 99, 147–154. doi:[10.1016/j.jad.2006.09.003](https://doi.org/10.1016/j.jad.2006.09.003)
- Sahl, J. C., Cohen, L. H., & Dasch, K. B. (2009). Hostility, interpersonal competence, and daily dependent stress: A daily model of stress generation. *Cognitive Therapy and Research*, 33, 199–210. doi:[10.1007/s10608-007-9175-5](https://doi.org/10.1007/s10608-007-9175-5)
- Segrin, C. (2001). Social skills and negative life events: Testing the deficit stress generation hypothesis. *Current Psychology: Developmental, Learning, Social*, 20, 19–35. doi:[10.1007/s12144-001-1001-8](https://doi.org/10.1007/s12144-001-1001-8)
- Seroczynski, A. D., Cole, D. A., & Maxwell, S. E. (1997). Cumulative and compensatory effects of competence and incompetence on depressive symptoms in children. *Journal of Abnormal Psychology*, 106, 586–597. doi:[10.1037/0021-843X.106.4.586](https://doi.org/10.1037/0021-843X.106.4.586)
- Shahar, G., Joiner, T. E., Jr., Zuroff, D. C., & Blatt, S. J. (2004). Personality, interpersonal behavior, and depression: Co-existence of stress-specific moderating and mediating effects. *Personality and Individual Differences*, 36, 1583–1596. doi:[10.1016/j.paid.2003.06.006](https://doi.org/10.1016/j.paid.2003.06.006)
- Shih, J. H. (2006). Sex differences in stress generation: An examination of sociotropy/autonomy, stress, and depressive symptoms. *Personality and Social Psychology Bulletin*, 32, 434–446. doi:[10.1177/0146167205282739](https://doi.org/10.1177/0146167205282739)
- Shih, J. H., Abela, J. R. Z., & Starrs, C. (2009). Cognitive and interpersonal predictors of stress generation in children of affectively ill parents. *Journal of Abnormal Child Psychology*, 37, 195–208. doi:[10.1007/s10802-008-9267-z](https://doi.org/10.1007/s10802-008-9267-z)
- Solomon, D. A., Keller, M. B., Leon, A. C., Mueller, T. I., Lavori, P. W., Shea, M. T., ... Endicott, J. (2000). Multiple recurrences of major depressive disorder. *American Journal of Psychiatry*, 157, 229–233. doi:[10.1176/appi.ajp.157.2.229](https://doi.org/10.1176/appi.ajp.157.2.229)
- Starrs, C. J., Abela, J. R. Z., Shih, J. H., Cohen, J. R., Yao, S., Zhu, X. Z., & Hammen, C. L. (2010). Stress generation and vulnerability in adolescents in mainland China. *International Journal of Cognitive Therapy*, 3, 345–357. doi:[10.1521/ijct.2010.3.4.345](https://doi.org/10.1521/ijct.2010.3.4.345)
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. New York, NY: HarperCollins College.
- Tram, J. M., & Cole, D. A. (2000). Self-perceived competence and the relation between life events and depressive symptoms in adolescence: Mediator or moderator? *Journal of Abnormal Psychology*, 109, 753–760. doi:[10.1037/0021-843X.109.4.753](https://doi.org/10.1037/0021-843X.109.4.753)
- Tzelgov, J., & Avishai, H. (1991). Suppression situations in psychological research: Definitions, implications, and applications. *Psychological Bulletin*, 109, 524–536. doi:[10.1037/0033-2909.109.3.524](https://doi.org/10.1037/0033-2909.109.3.524)
- Uhrlass, D. J., & Gibb, B. E. (2007). Negative life events, self-perceived competence, and depressive symptoms in young adults. *Cognitive Therapy and Research*, 31, 773–783. doi:[10.1007/s10608-006-9101-2](https://doi.org/10.1007/s10608-006-9101-2)
- Uhrlass, D. J., Schofield, C. A., Coles, M. E., & Gibb, B. E. (2009). Self-perceived competence and prospective changes in symptoms of depression and social anxiety. *Journal of Behavior Therapy and Experimental Psychiatry*, 40, 329–337. doi:[10.1016/j.jbtep.2009.01.001](https://doi.org/10.1016/j.jbtep.2009.01.001)
- Whisman, M. A., Perez, J. E., & Ramel, W. (2000). Factor structure of the beck depression inventory-second edition (BDI-II) in a student sample. *Journal of Clinical Psychology*, 56, 545–551. doi:[10.1002/\(SICI\)1097-4679\(200004\)56:4<545::AID-JCLP7>3.0.CO;2-U](https://doi.org/10.1002/(SICI)1097-4679(200004)56:4<545::AID-JCLP7>3.0.CO;2-U)
- Wylie, R. C. (1974). *The self-concept: A review of methodological considerations and measuring instruments* (Rev. ed., Vol. 1). Lincoln, NE: Lincoln University of Nebraska Press.