

Rejection Sensitivity and Depression: Mediation by Stress Generation

Richard T. Liu, Morganne A. Kraines, Maya Massing-Schaffer,
and Lauren B. Alloy

Rejection sensitivity has been found to confer risk for depression. The process through which this occurs remains unclear. This risk factor also has been associated with negative behavioral tendencies and interpersonal difficulties. Drawing on these different lines of research, the current investigation aimed to evaluate stress generation, the tendency for depression-prone individuals to experience higher rates of life stressors that are at least in part influenced by their own behavior, as a potential mechanism mediating the link between rejection sensitivity and subsequent depressive symptoms. Sixty-six adults with a history of depression were followed over a 4-month interval and completed assessments of rejection sensitivity and depressive symptoms at baseline, and depressive symptoms, a diagnostic interview for depression, and a contextual threat life stress interview at 4-month follow-up. Consistent with the stress generation hypothesis, rejection sensitivity predicted higher rates of dependent stressors, but not independent ones, over the 4-month prospective follow-up period. Furthermore, prospectively occurring dependent stressors mediated the relationship between baseline rejection sensitivity and depressive symptoms at follow-up. The finding that stress generation may operate as a mediating mechanism underlying the pathway between rejection sensitivity and depression lends preliminary support for the importance of targeting maladaptive behavioral tendencies in rejection-sensitive individuals in clinical settings.

Depression is a disorder of considerable homotypic continuity. Indeed, a past history of depression consistently has been found to be one of the strongest predictors of its future recurrence (Keenan, Feng, Hipwell, & Klostermann, 2009; Lewinsohn, Zeiss, & Duncan, 1989). Given the high public

health burden associated with this illness (World Health Organization, 2008), it remains imperative to delineate the pathogenic processes underlying its recurrence so as to inform future clinical intervention strategies. Much empirical attention has been directed to assessing maladaptive cognitive and in-

Richard T. Liu, PhD, Morganne A. Kraines, BA, and Maya Massing-Schaffer, BA, are affiliated with the Department of Psychiatry and Human Behavior, Brown University Alpert Medical School, Providence, Rhode Island. Lauren B. Alloy, PhD, is affiliated with the Department of Psychology, Temple University, Philadelphia, Pennsylvania.

Address correspondence to Richard T. Liu, PhD, Department of Psychiatry and Human Behavior, Brown University, 1011 Veterans Memorial Parkway, East Providence, RI 02915. E-mail: rtlupsych@gmail.com

terpersonal characteristics as risk factors for depression (Hames, Hagan, & Joiner, 2013; Mathews & MacLeod, 2005; Scher, Ingram, & Segal, 2005). Insofar as these enduring traits remain present during euthymia, and thus chronically place individuals who possess them at risk for depression, in some measure they may account for the high rate of recurrence often observed with this disorder (Burcusa & Iacono, 2007).

One such risk factor that has been implicated in the pathogenesis of depression is rejection sensitivity (RS). According to the RS model (Downey & Feldman, 1996), individuals sensitive to rejection by others are more likely to expect, perceive, and overreact to social rejection. Rejection-sensitive individuals are more likely to interpret and attend to ambiguous social cues in a manner consistent with their fear of rejection. This negative social-cognitive style has been hypothesized to be a stable risk factor for depression (Downey & Feldman, 1996; Downey, Freitas, Michaelis, & Khouri, 1998). Support for this association has been reported in several previous studies (Ayduk, Downey, & Kim, 2001; Chango, McElhaney, Allen, Schad, & Marston, 2012; Pearson, Watkins, & Mullan, 2010; Tops, Riese, Oldehinkel, Rijsdijk, & Ormel, 2008).

What remain relatively unexamined, however, are the processes through which RS confers risk for depression. One recent study examined the possibility that RS may serve as a diathesis moderating the depressogenic effect of stress within interpersonal relationships (Chango et al., 2012). Consistent with a stress-diathesis model of depression, RS interacted with interpersonal difficulties prospectively to predict depressive symptoms in a sample of late adolescents. Specifically, stress within the mother-child relationship was associated with greater depressive symptoms among adolescents high in RS, but not those low in this risk factor. In like manner, difficulties within peer relationships predicted greater depressive symptoms only in adolescents with high RS. Although this study is important in providing preliminary evidence

of a moderating role of RS in depression, research is also needed to determine the mediational pathways through which this vulnerability factor confers its depressogenic effect. Clarifying these processes is important for the identification of potential targets for future treatment and prevention efforts.

One intriguing possibility yet to be examined is that RS may generate the very stressors that lead to subsequent depression. According to the stress generation hypothesis (Hammen, 1991, 2006), depression-prone individuals, when compared to others, tend to experience higher rates of life stressors that are at least partially influenced by their own behavioral and cognitive characteristics (i.e., dependent stressors), but do not differ in the prospective occurrence of stressors that are outside their control (i.e., independent stressors). Because prior research has found dependent stressors, relative to independent ones, to be more strongly related to depression (Hammen, Marks, Mayol, & DeMayo, 1985; Kendler, Gardner, & Prescott, 2002, 2006), stress generation has been proposed as a mechanism underlying depression chronicity (Hammen, 1991, 2006).

Several similar depressogenic risk factors have been implicated in the stress generation process. In particular, excessive reassurance seeking, a self-propagatory interpersonal vulnerability of particular relevance to Coyne's (1976) interpersonal theory of depression, is characterized by a tendency to seek reassurance from others so as to confirm the individual's self-worth, and the care and interest of significant others. Doubting the sincerity of the initial reassurance they receive, depression-prone individuals repeatedly seek confirmation of their worth until irritation and frustration are experienced by others, leading to deterioration of the relationship and rejection. Empirical support has been found for this interpersonal process in association with depressive symptoms and social rejection (Hames et al., 2013; Starr & Davila, 2008). Moreover, excessive reassurance seeking has received consistent support as a predictor of stress generation (e.g.,

Birgenheir, Pepper, & Johns, 2010; Shih, Abela, & Starrs, 2009; Shih & Auerbach, 2010). Sociotropy, a social-cognitive style characterized by a tendency to base one's self-worth on interpersonal relationships and to be vulnerable to social criticism and rejection (Beck, 1983), also has been implicated in the stress generation process (e.g., Birgenheir et al., 2010; Daley et al., 1997). Finally, self-criticism also has been associated with the generation of dependent, but not independent, life stressors (Shahar, Joiner, Zuroff, & Blatt, 2004; Shahar & Priel, 2003).

Although RS has not been examined previously in relation to stress generation, there is reason to suspect its potential relevance to this phenomenon. Specifically, RS has been hypothesized to exert a deleterious effect on interpersonal relationships through self-fulfilling behavioral tendencies. Indeed, consistent support for this view has been found across different studies. In particular, rejection-sensitive individuals and their romantic partners tend to experience greater dissatisfaction in their relationship (Downey & Feldman, 1996). Additionally, in an observational study, rejection-sensitive individuals have been found to react more negatively to ambiguous behavior in others (Downey & Feldman, 1996). Furthermore, these individuals are more likely to experience a breakup in their romantic relationships, and their negative behavior (e.g., negative voice tone, denying responsibility for problems in the relationship, and putting down their partner) during conflict-related discussions within observational settings has been associated with negative postdiscussion affect in their romantic partner (Downey et al., 1998). The extent to which these behaviors are directly associated with subsequent depression has yet to be assessed. Collectively, however, these findings are suggestive of the possibility that stress generation may operate as a mediating mechanism through which RS is linked with depression.

Moreover, these negative behavioral tendencies associated with RS are suggestive of the possibility that it may function as a

risk factor for stress generation uniquely different from those identified thus far in the empirical literature. That is, excessive reassurance seeking is motivated largely by a desire for affirmation from others with whom the individual feels insecure (e.g., doubting the sincerity of received reassurance). Although similarly based on feelings of insecurity in interpersonal relationships, RS is contrastingly associated with behavioral tendencies directly confronting close others regarding perceived rejection (e.g., putting down a romantic partner) rather than with positive affirmation. Additionally, the negative interpersonal behaviors characteristic of rejection-sensitive individuals are notably absent in the theoretical conceptualization of sociotropy. Finally, in contrast to the inward focus of self-criticism, the negative cognitions associated with RS tend to be directed more externally (e.g., denying responsibility for interpersonal conflict).

The current study aimed to address this gap by evaluating whether stress generation functioned as an explanatory process through which RS confers risk for later depression. Specifically, we assessed RS as a predictor of prospectively occurring stressors and depressive symptoms in a sample of adults with a history of depression. We hypothesized that this risk factor would prospectively predict higher rates of dependent, but not independent, stressors over a 4-month period. Furthermore, we also hypothesized that dependent stressors would mediate the relationship between RS and subsequent depressive symptoms.

METHOD

Participants

Participants consisted of a subsample derived from a larger Institutional Review Board (IRB)-approved study examining associations between negative life events and depressogenic risk factors in university un-

dergraduates. Informed consent was obtained from all participants. Only those with a lifetime history of depression at the time of study enrollment ($n = 66$, 77.3% female) were included in the current study (for a prior study utilizing this sample, see Liu, Choi, Boland, Mastin, & Alloy, 2013). The mean age for the sample was 19.86 years ($SD = 1.67$), and 62.12% were Caucasian, 25.76% African American, 9.09% Asian, 1.52% Latino, and 1.52% other ethnicity. Participants received either course credit or a small monetary compensation.

Measures

Life Events Scale (LES) and Life Events Interview (LEI). The LES and LEI (Safford, Alloy, Abramson, & Crossfield, 2007) were used to assess the occurrence of life stressors across content domains relevant to college students (e.g., school, family, finances, and romantic relationships). Only stressors with onsets during the 4-month period between the initial assessment (T1) and the follow-up assessment (T2) were assessed in the present study so as to capture events occurring after measurement of RS at T1 and prior to T2 measurement of depressive symptoms. This 4-month follow-up period was chosen based on the finding that recollection of all but the most severe events tends to fade from recollection after approximately half a year (Brown & Harris, 1982). At the same time, this time interval allowed for sufficient variability in the occurrence of stressors under consideration.

After completing the LES, participants were interviewed by a trained research assistant or clinical psychology doctoral student using the LEI. The LEI used in the current study was adapted to comply with the contextual threat method (Brown & Harris, 1978). That is, in an effort to assess the impact of individual events, participants were probed for objective information surrounding the circumstances, timing, duration, and consequence of events endorsed on the LES.

This emphasis on objective and concrete indicators of reported events ensured that collected information accurately reflected actual event occurrences rather than mood-congruent interpretive biases (e.g., having a “feeling” one will fail an upcoming final exam would not qualify as an event, whereas receiving a failing grade would). In addition, this contextual information allowed for accurate coding of each event in terms of independence/dependence by three raters, who were blind to participants’ depressive symptoms, diagnostic history, and RS scores, using a 3-point Likert scale (1 = *mostly independent of participant*; 2 = *partly dependent on participant*; 3 = *mostly dependent on participant*). Events with ratings of 2 or more were considered dependent events (e.g., interpersonal conflict), and events with ratings of 1 were categorized as independent events (e.g., death of a parent) for the purposes of study analyses. Interrater reliability was high ($ICC = .90$).

Rejection Sensitivity Questionnaire (RSQ). The RSQ (Downey & Feldman, 1996) was used to assess RS. This questionnaire presents 18 hypothetical situations in which an individual is susceptible to rejection by an important other (e.g., asking someone out on a date). For each scenario, respondents indicate their level of concern regarding the potential for rejection on a 6-point Likert scale (1 = *very unconcerned*; 6 = *very concerned*). Participants then estimate the likelihood, using a 6-point Likert scale (1 = *very unlikely*; 6 = *very likely*), that the interactor will respond favorably. These acceptance expectation ratings were reverse-scored to obtain measures of rejection expectation. Total RS scores were computed by multiplying rejection expectations and rejection concern ratings and then averaging the resultant values across the 18 situations. Higher scores on the RSQ reflect greater sensitivity to rejection. In the current study, this instrument had high internal consistency ($\alpha = .88$).

TABLE 1. Bivariate Correlational Relationships Between Main Study Variables ($n = 66$)

Variable	1	2	3	4	5	6
1. Female Gender	—					
2. Time 1 BDI-II	.134	—				
3. Time 2 BDI-II	.043	.515**	—			
4. Rejection Sensitivity	.180	.269*	.380**	—		
5. Dependent Stressors	.198	.340**	.595**	.474**	—	
6. Independent Stressors	.156	.073	.248*	.252*	.300*	—
Mean	—	10.66	8.73	10.36	4.41	1.02
Standard Error	—	.95	.94	.54	.12	.39

Note. * $p < .05$, ** $p < .01$. BDI-II = Beck Depression Inventory II.

Modified Schedule for Affective Disorders and Schizophrenia-Lifetime Interview (SADS-L). The SADS-L (Endicott & Spitzer, 1978) is a semistructured interview used to assess current and lifetime history of Axis I disorders. It was modified for the current study to meet *DSM-IV-TR* (American Psychiatric Association, 2000) criteria for major and minor depression (for details, see Alloy et al., 2000). The modified SADS-L interview was conducted by research assistants and doctoral students in clinical psychology to assess major and minor depression history prior to T1. Interviewers received extensive training in diagnostic interviewing, including didactic instruction, role playing, and observation and practice of live interviews. The modified SADS-L has demonstrated high interrater reliability for depression diagnoses ($\kappa \geq .90$; Alloy et al., 2000).

Beck Depression Inventory II (BDI-II). The Beck Depression Inventory II (Beck, Brown, & Steer, 1996) is a 21-item self-report measure used at T1 and T2 to assess current depressive symptoms. Higher scores reflect greater depressive symptom severity. The internal consistency in the current sample was found to be good ($\alpha_{T1} = .88$ and $\alpha_{T2} = .90$).

Procedure

Participants were assessed at two time points separated by 4 months ($M = 117.77$

days, $SD = 10.45$). During T1, they completed the BDI-II and RSQ. At T2, participants completed the BDI-II and LES. They also completed two semistructured interviews, the LEI and the modified SADS-L. The LES and LEI were used to assess negative life events that had occurred since T1.

RESULTS

Preliminary Analyses

Because T1 and T2 depressive symptom scores were positively skewed, they were submitted to a square root transformation to satisfy assumptions of normality. We conducted a series of correlation analyses to assess possible associations between demographic characteristics (i.e., gender, ethnicity, and age) and prospective occurrence of dependent and independent stressors over the 4-month follow-up period. None of the demographic variables were correlated with independent or dependent events ($ps > .05$).

Table 1 presents bivariate correlations between the main study variables. RS was positively correlated with T1 and T2 depressive symptoms, as well as dependent and independent stressors. The correlation between RS and gender was not significant.

TABLE 2. Hierarchical Regression Analyses of Rejection Sensitivity as a Predictor of Dependent and Independent Stressors ($n = 66$)

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²	ΔR^2	Partial Correlation
Predicting to Dependent Stressors						
Step 1				.139	—	
Female Gender	1.159	.880	1.317			.164
Time 1 BDI-II	.804	.297	2.708**			.323
Step 2				.283	.144	
Female Gender	.723	.820	.882			.111
Time 1 BDI-II	.554	.282	1.964			.242
Rejection Sensitivity	.285	.081	3.519***			.408
Predicting to Independent Stressors						
Step 1				.027	—	
Female Gender	.348	.292	1.191			.148
Time 1 BDI-II	.042	.099	.426			.054
Step 2				.076	.049	
Female Gender	.269	.290	.924			.117
Time 1 BDI-II	-.004	.100	-.035			-.004
Rejection Sensitivity	.052	.029	1.811			.224

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; BDI-II = Beck Depression Inventory II.

Test of Rejection Sensitivity as a Stress Generation Predictor

To assess the degree to which RS predicted the occurrence of dependent, but not independent, stressors over a 4-month follow-up period, we conducted two hierarchical linear regression analyses with dependent and independent stressors, respectively, as the criterion variable. Given that female gender and depressive symptoms have been associated with stress generation (Liu & Alloy, 2010), both variables were covaried in all analyses. Both covariates were entered in Step 1 of the hierarchical regression analyses, and RS was entered in Step 2.

As detailed in Table 2, T1 depressive symptoms were positively associated with prospectively occurring dependent stressors, whereas female gender was not. Additionally, RS was predictive of prospectively occurring dependent stressors over and above the effects of female gender and T1 depressive symptoms. That is, higher RS predicted

greater occurrence of dependent stressors. In contrast, T1 depressive symptoms, female gender, and RS each were not predictive of prospectively occurring independent stressors.

Although none of the predictors of interest evidenced multicollinearity based on variance inflation factors, a suppressor effect was observed for T1 depressive symptoms. That is, T1 depressive symptoms were positively correlated at the bivariate level with independent stressors, but had a negative *B* weight in the regression analysis with independent stressors as the criterion variable. To assess the extent to which this suppressor effect affected our results, the regression analysis was repeated with this variable excluded (see Cohen & Cohen, 1983, and Tabachnick & Fidell, 1996, for a more detailed explanation of suppressor variables, and Gibb et al., 2006, and Liu, Jager-Hyman, Wagner, Alloy, & Gibb, 2012, for prior studies similarly addressing suppressor effects). Both female

TABLE 3. Hierarchical Linear Regression Analysis for the Prospective Prediction of Time 2 BDI-II ($n = 66$)

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>R</i> ²	ΔR^2	Partial Correlation
Step 1				.332	—	
Female Gender	-.218	.350	-.622			-.079
Time 1 BDI-II	.502	.120	4.173***			.468
Rejection Sensitivity	.085	.034	2.477*			.300
Step 2				.481	.149	
Female Gender	-.363	.313	-1.161			-.147
Time 1 BDI-II	.391	.110	3.543***			.413
Rejection Sensitivity	.028	.034	.839			.107
Dependent Stressors	.201	.048	4.178***			.472

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. BDI-II = Beck Depression Inventory II.

gender and RS remained nonsignificant predictors of independent stressors.

Stress Generation as a Mediator of the Relationship Between Rejection Sensitivity and Depressive Symptoms

As summarized in Step 1 of Table 3, we assessed whether dependent stressors mediated the relationship between RS and T2 depressive symptoms. Specifically, we first regressed T2 depressive symptoms on to RS, while covarying gender and T1 depressive symptoms. T1 depressive symptoms were significantly associated with T2 depressive symptoms, and RS was predictive over and above gender and T1 depressive symptoms. In Step 2, prospectively occurring dependent stressors was entered as a predictor in the regression model. We found that T1 depressive symptoms remained a significant predictor, whereas RS was no longer significant. In addition, dependent stressors were predictive of T2 depressive symptoms over and above gender, T1 depressive symptoms, and RS.

To assess whether the mediational relationship between RS and T2 depressive symptoms through prospectively occurring dependent stressors was significant, the 95% confidence interval around the product of the two components of the mediational pathway was computed using the PRODCLIN program (MacKinnon, Fritz, Williams, &

Lockwood, 2007). A 95% confidence interval that does not include zero is indicative of significant mediation. Entering into the PRODCLIN program the unstandardized coefficients and standard errors for the pathway from RS to dependent stressors and the pathway from dependent stressors to T2 depressive symptoms yielded a 95% confidence interval of .021 to .104, indicating that dependent stressors were a significant mediator of the relationship between RS and T2 depressive symptoms. This mediational relationship is illustrated in Figure 1.

A suppressor effect was evident in these analyses. Specifically, gender was positively correlated at the bivariate level with T2 depressive symptoms, but had a negative *B* weight in the regression analysis with T2 depressive symptoms as the criterion variable. Thus, to determine whether this suppressor effect influenced the result of this analysis, it was repeated with gender removed as a predictive variable. Again, the results remained essentially unchanged.

DISCUSSION

Prior studies have found RS to be a risk factor for depression, but the processes through which this occurs have not yet been determined. Although this risk factor also has been associated with negative behavioral

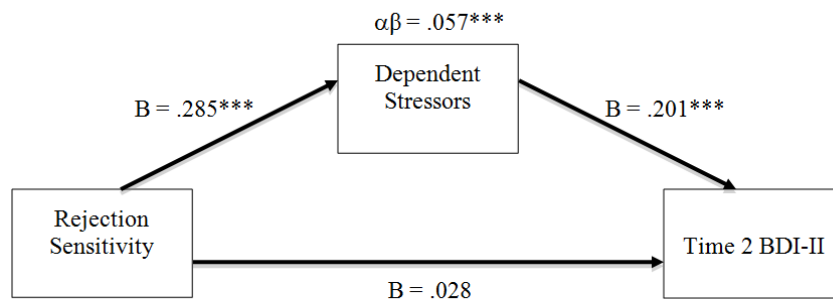


FIGURE 1. Mediation model of rejection sensitivity, dependent stressors, and Time 2 depressive symptoms.
 $***p < .001$; BDI-II = Beck Depression Inventory II.

styles and reduced relationship satisfaction in close others, the degree to which maladaptive behavioral tendencies, rather than cognitive biases alone, account for the depressogenic effect of RS is unclear. The current study attempted to integrate these different lines of research within the framework of the stress generation hypothesis. Specifically, it examined whether stress generation functioned as a mediational mechanism accounting for the link between RS and subsequent depressive symptoms. We found support for our hypotheses. That is, greater RS predicted higher rates of prospectively occurring dependent stressors, but not independent stressors. Furthermore, these dependent stressors mediated the relationship between RS and subsequent depressive symptoms. These findings add to the growing literature implicating stress generation as a mechanism underlying the depressogenic effect of several similar maladaptive interpersonal and cognitive styles (e.g., neuroticism, Kercher, Rapee, & Schniering, 2009; excessive reassurance seeking, Potthoff, Holahan, & Joiner, 1995; an avoidance coping style, Holahan, Moos, Holahan, Brennan, & Schutte, 2005; and self-criticism, Shahar et al., 2004).

The clinical implications of the current findings warrant mention. Insofar as the depressogenic influence of RS is largely cognitive in nature (i.e., consistently self-defeating

interpretations of ambiguous social situations), it may benefit intervention strategies to target these negative cognitive tendencies. Alternatively, to the degree that RS confers risk for depression largely through engagement in maladaptive behaviors, behavioral modification strategies may be an important component of treatment. Our finding that objectively occurring stressors, rather than strictly the subjective perception of them, mediate the relationship between RS and depressive symptoms lends weight to the latter possibility. Given that RS is conceptualized as a trait-like risk factor, this finding also suggests that RS may confer heightened chronic depressogenic risk by generating the very stressors that precipitate future depression. Also lending weight to this possibility is the finding that dependent stressors, relative to independent ones, appear to have a greater role in the etiology of depression (Hammen et al., 1985; Kendler et al., 2002, 2006).

Several strengths of the current study may be noted. Perhaps the most important of these is the adoption of a contextual threat interview-based approach to assessing life stressors, which offers several significant methodological advancements over self-report life stress inventories. Such self-report checklists are more commonly used in prior studies examining stress generation as a mediating mechanism between established risk

factors and subsequent depressive symptoms. The contextual threat approach elicits from the respondent a narrative for each reported event, including the context in which it occurred and its consequences. Such information is particularly important in stress generation research because it allows for accurate determination of whether a given stressor is at least in part dependent on the respondent's behavior or independent of it (e.g., leaving school because of disinterest or because of a congenital health condition). Another benefit of this approach that is particularly relevant to the current study is its focus on objective and concrete indicators of events, which ensured that reported events accurately reflected actual occurrences rather than simply the interpretive biases characteristic of RS. This is an important consideration in that stress generation involves the actual occurrence of stressors rather than the perception of them. It is in part for these reasons that interview-based approaches are currently regarded as the gold standard for assessing life stressors (Hammen, 2005; Monroe, 2008). Additionally, whereas previous research has used non-clinical samples to examine RS and depressive symptoms, and stress generation as a mediator of risk for depression, a strength of the current study is that it provides the first assessment of this RS and stress generation as a mediator in individuals with a history of clinical depression.

The current study is not without its limitations. Specifically, our sample size precluded the possibility of assessing possible gender interactions. Given that RS and stress generation may be more relevant to females than males (Downey et al., 1998; Liu & Alloy, 2010), future research with larger samples assessing gender as a potential moderator is warranted. Second, although the current study builds upon prior research by assessing RS in relation to depressive symptoms in individuals with a history of clinical depression, the extent to which this social-cognitive style prospectively predicts depressive episodes and the degree to which stress generation mediates this relationship remain

unexamined. Although stress generation has been posited to occur during euthymia, being in large part the product of stable and maladaptive cognitive and behavioral tendencies (Hammen, 1991, 2006), the degree to which stress generation and its risk factors are etiologicaly relevant to depression is dependent on the extent to which they are associated with depressive recurrence. Indeed, there is a lack of research evaluating the etiological chain underlying depressive recurrence articulated in the stress generation hypothesis (Hammen & Shih, 2008; Liu, 2013). The current findings validate the need for future research in this area. Additionally, although the rates of dependent and independent stressors observed in the present study are not dissimilar to those found in prior stress generation research (e.g., Hammen, 1991), a longer follow-up interval for assessing life stressors would allow for greater variability in the occurrence of relatively infrequent major life stressors (e.g., the death of a family member). Finally, the current study evaluated RS as a stress generation predictor in the absence of other previously identified interpersonal and cognitive risk factors. It will be important for future research in this area simultaneously to assess the relative effect of multiple risk factors, thereby addressing the need to extend beyond single-risk factor models toward a more integrative understanding of the stress generation process (Liu, 2013). For example, given that RS has been found to mediate the relationship between ruminative brooding and depressive symptoms (Pearson, Watkins, & Mullan, 2011), an interesting possibility not yet examined is whether the mediational effect of RS may occur indirectly through stress generation (i.e., a serial multiple mediator model). In addition to lending clarity to the etiological pathway through which risk for depression is conferred, such information is important to the extent that it may aid in the identification of multiple points of targeted clinical intervention.

REFERENCES

- Alloy, L. B., Abramson, L. Y., Hogan, M. E., Whitehouse, W. G., Rose, D. T., Robinson, M. S., . . . 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.
- Ayduk, O., Downey, G., & Kim, M. (2001). Rejection sensitivity and depressive symptoms in women. *Personality and Social Psychology Bulletin, 27*, 868–877. doi:10.1177/0146167201277009
- 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.
- Birgenheir, D. G., Pepper, C. M., & Johns, M. (2010). Excessive reassurance seeking as a mediator of sociotropy and negative interpersonal life events. *Cognitive Therapy and Research, 34*, 188–195. doi:10.1007/s10608-009-9242-1
- Brown, G. W., & Harris, T. O. (1978). *Social origins of depression*. New York, NY: Free Press.
- Brown, G. W., & Harris, T. (1982). Fall-off in the reporting of life events. *Social Psychiatry, 17*, 23–28. doi:10.1007/BF00583889
- Burcusa, S. L., & Iacono, W. G. (2007). Risk for recurrence in depression. *Clinical Psychology Review, 27*, 959–985. doi:10.1016/j.cpr.2007.02.005
- Chango, J. M., McElhaney, K. B., Allen, J. P., Schad, M. M., & Marston, E. (2012). Relational stressors and depressive symptoms in late adolescence: Rejection sensitivity as a vulnerability. *Journal of Abnormal Child Psychology, 40*, 369–379. doi:10.1007/s10802-011-9570-y
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry, 39*, 28–40.
- Daley, S. E., Hammen, C., Burge, D., Davila, J., Paley, B., Lindberg, N., & Herzberg, D. S. (1997). Predictors of the 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., & Feldman, S. I. (1996). Implications of rejection sensitivity for intimate relationships. *Journal of Personality and Social Psychology, 70*, 1327–1343. doi:10.1037/0022-3514.70.6.1327
- 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.
- 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
- Hames, J. L., Hagan, C. R., & Joiner, T. E. (2013). Interpersonal processes in depression. *Annual Review of Clinical Psychology, 9*, 355–377. doi:10.1146/annurev-clinpsy-050212-185553
- Hammen, C. (1991). 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., 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
- Hammen, C., & Shih, J. H. (2008). Stress generation and depression. In K. S. Dobson & D. J. A. Dozois (Eds.), *Risk factors in depression* (pp. 317–341). San Diego, CA: Academic Press.
- Holahan, C. J., Moos, R. H., Holahan, C. K., Brennan, P. L., & Schutte, K. K. (2005). Stress generation, avoidance coping, and depressive symptoms: A 10-year model. *Journal of Consulting and Clinical Psychology*, 73, 658–666. doi:10.1037/0022-006X.73.4.658
- Keenan, K., Feng, X., Hipwell, A., & Klosterrmann, S. (2009). Depression begets depression: Comparing the predictive utility of depression and anxiety symptoms to later depression. *Journal of Child Psychology and Psychiatry*, 50, 1167–1175. doi:10.1111/j.1469-7610.2009.02080.x
- Kendler, K. S., Gardner, C. O., & Prescott, C. A. (2002). Toward a comprehensive developmental model for major depression in women. *American Journal of Psychiatry*, 159, 1133–1145. doi:10.1176/appi.ajp.159.7.1133
- Kendler, K. S., Gardner, C. O., & Prescott, C. A. (2006). Toward a comprehensive developmental model for major depression in men. *American Journal of Psychiatry*, 163, 115–124. doi:10.1176/appi.ajp.163.1.115
- Kercher, A. J., Rapee, R. M., & Schniering, C. A. (2009). Neuroticism, life events and negative thoughts in the development of depression in adolescent girls. *Journal of Abnormal Child Psychology*, 37, 903–915. doi:10.1007/s10802-009-9325-1
- Lewinsohn, P. M., Zeiss, A. M., & Duncan, E. M. (1989). Probability of relapse after recovery from an episode of depression. *Journal of Abnormal Psychology*, 98, 107–116. doi:10.1037/0021-843X.98.2.107
- 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
- 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
- Liu, R. T., Choi, J. Y., Boland, E. M., Mastin, B. M., & Alloy, L. B. (2013). Childhood abuse and stress generation: The mediational effect of depressogenic cognitive styles. *Psychiatry Research*, 206, 217–222. doi:10.1016/j.psychres.2012.12.001
- 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
- MacKinnon, D. P., Fritz, M. S., Williams, J., & Lockwood, C. M. (2007). Distribution of the product confidence limits for the indirect effect: Program PRODLIN. *Behavior Research Methods*, 39, 384–389. doi:10.3758/BF03193007
- Mathews, A., & MacLeod, C. (2005). Cognitive vulnerability to emotional disorders. *Annual Review of Clinical Psychology*, 1, 167–195. doi:10.1146/annurev.clinpsy.1.102803.143916
- 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
- Pearson, K. A., Watkins, E. R., & Mullan, E. G. (2010). Submissive interpersonal style mediates the effect of brooding on future depressive symptoms. *Behaviour Research and Therapy*, 48, 966–973. doi:10.1016/j.brat.2010.05.029
- Pearson, K. A., Watkins, E. R., & Mullan, E. G. (2011). Rejection sensitivity prospectively predicts increased rumination. *Behaviour Research and Therapy*, 49, 597–605. doi:10.1016/j.brat.2011.06.004
- Potthoff, J. G., Holahan, C. J., & Joiner, T. E. (1995). Reassurance seeking, stress generation, and depressive symptoms: An integrative model. *Journal of Personality and Social Psychology*, 68, 664–670. doi:10.1037/0022-3514.68.4.664
- 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
- Scher, C. D., Ingram, R. E., & Segal, Z. V. (2005). Cognitive reactivity and vulnerability: Empirical

- evaluation of construct activation and cognitive diatheses in unipolar depression. *Clinical Psychology Review*, 25, 487–510. doi:10.1016/j.cpr.2005.01.005
- Shahar, G., Joiner, T. E., 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
- Shahar, G., & Priel, B. (2003). Active vulnerability, adolescent distress, and the mediating/suppressing role of life events. *Personality and Individual Differences*, 35, 199–218. doi:10.1016/S0191-8869(02)00185-X
- 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
- Shih, J. H., & Auerbach, R. P. (2010). Gender and stress generation: An examination of interpersonal predictors. *International Journal of Cognitive Therapy*, 3, 332–344. doi:10.1521/ijct.2010.3.4.332
- Starr, L. R., & Davila, J. (2008). Excessive reassurance seeking, depression, and interpersonal rejection: A meta-analytic review. *Journal of Abnormal Psychology*, 117, 762–775. doi:10.1037/a0013866
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. New York, NY: Harper-Collins College.
- Tops, M., Riese, H., Oldehinkel, A. J., Rijdsdijke, F. V., & Ormel, J. (2008). Rejection sensitivity relates to hypocortisolism and depressed mood state in young women. *Psychoneuroendocrinology*, 33, 551–559. doi:10.1016/j.psyneuen.2008.01.011
- World Health Organization. (2008). *The global burden of disease: 2004 update*. Geneva: WHO Press.