
Self-Criticism, Dependency, and Stress Reactivity: An Experience Sampling Approach to Testing Blatt and Zuroff's (1992) Theory of Personality Predispositions to Depression in High-Risk Youth

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S. J. Blatt and D. C. Zuroff's 1992 theory of personality predispositions to depression posits that individuals who possess high levels of self-criticism and/or dependency are vulnerable to developing depression following negative events. The current study used experience sampling methodology to test this theory in a sample of 49 children ages 7 to 14. Children completed measures of dependency, self-criticism, and depressive symptoms. Subsequently, children were given a handheld computer that signaled them to complete measures of depressive symptoms and negative events at randomly selected times over 2 months. Results of hierarchical linear modeling analyses indicated that higher levels of both self-criticism and dependency were associated with greater elevations in depressive symptoms following negative events. Furthermore, each personality predisposition remained a significant predictor of such elevations after controlling for the interaction between the other personality predisposition and negative events. The results suggest that dependency and self-criticism represent distinct vulnerability factors to depression in youth.

Keywords: *self-criticism; dependency; stress reactivity; depression; high-risk youth*

Over the last three decades, researchers from cognitive and psychodynamic backgrounds have generated a large body of research regarding theories of personality predispositions to depression (e.g., Beck,

1983; Blatt, 1974; Blatt, D'Afflitti, & Quinlan, 1976; Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982; Blatt & Zuroff, 1992; Clark & Beck, 1991; Clark, Beck, & Brown, 1992). Although diverging in their specific formulations, conceptualizations of personality predispositions have focused on two common themes: fulfillment of acceptance and achievement needs. Cognitive conceptualizations are exemplified by Beck's (1983) constructs of sociotropy and autonomy. Whereas individuals high in sociotropy are motivated to form and maintain relationships, individuals high in autonomy focus on goals associated with the development of the self, such as achievement. Similarly, psychodynamic formulations have centered around the personality predispositions of dependency and self-criticism (e.g., Blatt et al., 1976; Blatt & Zuroff, 1992; Zuroff, Moskowitz, & Cote, 1999; Zuroff, Moskowitz, Wiegus, Powers, & Franko, 1983). Individuals high in dependency rely on others to maintain their sense of well-being through closeness, intimacy, and/or reassurance of their worth. Individuals high in self-criticism derive well-being from

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PSPB, Vol. XX No. X, Month XXXX xx-xx

DOI: 10.1177/0146167209343811

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meeting (or exceeding) standards of their own design, or those imposed by others, thereby achieving or maintaining acceptance (Blatt, 1974).

THE SPECIFIC VULNERABILITY HYPOTHESIS

Both cognitive and psychodynamic formulations have proposed a specific vulnerability hypothesis, or personality–event congruence hypothesis (Beck, 1983; Blatt & Zuroff, 1992; Hammen, Marks, Mayol, & deMayo, 1985), according to which individuals exhibiting personality predispositions to depression are only at risk of developing depression following the occurrence of negative events congruent with their personality predispositions. Specifically, dependent/sociotropic individuals are at greatest risk of developing depressive symptoms when encountering negative interpersonal events (e.g., conflict, loss, rejection), whereas self-critical/autonomous individuals are at greatest risk of developing depressive symptoms when encountering negative achievement events (e.g., poor performance evaluation). A corollary of this hypothesis is that individuals displaying high levels of dependency/sociotropy are not at elevated risk for developing depressive symptoms following the occurrence of negative achievement events. Likewise, individuals showing high levels of self-criticism/autonomy are not at elevated risk for developing depressive symptoms following negative interpersonal events.

Studies examining Blatt and Zuroff's (1992) and Beck's (1983) specific vulnerability hypothesis in adult samples have obtained mixed results. Although some studies have obtained strong empirical support for the specific vulnerability hypothesis (e.g., Blaney & Kutcher, 1991; Santor & Patterson, 2004; Zuroff, Igraja, & Mongrain, 1990), others have obtained little or no support (e.g., Bagby, Segal, & Schuller, 1995; Smith, O'Keefe, & Jenkins, 1988). Additionally, some studies have found support for the specific vulnerability hypothesis only in sociotropic/dependent (e.g., Bartelstone & Trull, 1995; Hammen et al., 1985; Lakey & Ross, 1994; Zuroff & Mongrain, 1987) or self-critical individuals (e.g., Segal, Shaw, Vella, & Katz, 1992).

SPECIFIC VULNERABILITY IN YOUTH

Both Beck (1983) and Blatt (1974) proposed that personality vulnerabilities to depression arise early in development, suggesting that theories of personality predispositions to depression apply to children and adolescents. A small number of tests of the specific vulnerability hypothesis have been conducted in children within the framework of Beck's cognitive theory and

Blatt and Zuroff's (1992) psychodynamic theory of personality predispositions to depression.

Support for the specific vulnerability hypothesis in youth within the framework of Beck's (1983) theory has been inconsistent. In a 6-month prospective study of 64 children (ages 8 to 16) categorized as being vulnerable in either the achievement or interpersonal domain based on their performance on a self-schema task, Hammen and Goodman-Brown (1990) reported that children were more likely to experience increases in depressive symptoms following domain-congruent, as opposed to domain-incongruent, stressors. In a 3-month prospective study of 486 fifth and sixth graders, Little and Garber (2000) reported that neediness, one component of sociotropy, predicted increases in depressive symptoms in both boys and girls independent of stress. Connectedness, a second component of sociotropy, interacted with social stressors to predict depressive symptoms in boys but predicted increases in depressive symptoms irrespective of stress in girls. Personality predispositions in the achievement domain failed to predict increases in depressive symptoms either as a main effect or in interaction with stressors. In a 12-month prospective study of 129 adolescents, Little and Garber (2004) found neediness and connectedness to interact with negative peer, but not academic, events to predict increases in depressive symptoms in girls but not boys. In contrast, neither achievement orientation nor self-criticism predicted change in depressive symptoms either alone or in interaction with stressors. Finally, in a 12-month prospective study of 185 sixth graders with a parent with a history of affective illness, Little and Garber (2005) found neediness and connectedness to predict increases in depressive symptoms over time through the mediating role of dependent, but not independent, interpersonal negative events. This relation, however, was not mediated by dependent noninterpersonal negative events.

Support for the specific vulnerability hypothesis in youth within the framework of Blatt and Zuroff's (1992) theory has been equally inconsistent. In a 6-month prospective study of third ($n = 119$) and seventh ($n = 184$) graders, Abela and Taylor (2003) reported that self-criticism interacted with negative achievement, but not interpersonal, events to predict increases in depressive symptoms in seventh-grade boys with low but not high self-esteem. In third graders, self-criticism interacted with both negative achievement and interpersonal events to predict increases in depressive symptoms in children with low but not high self-esteem. In contrast, self-criticism did not confer vulnerability to depressive symptoms in seventh-grade girls. Furthermore, dependency did not predict increases in depressive symptoms in any of the groups. In a 12-month prospective study of 460 sixth and seventh graders, Shahar, Blatt,

Zuroff, Kuperminc, and Leadbeater (2004) found self-criticism, but not dependency, to predict increases in depressive symptoms in girls, but not boys, independent of negative events. In a 4-month prospective study of 603 ninth graders, Shahar and Priel (2003) found self-criticism to interact with negative interpersonal, but not achievement, events to predict increases in depressive symptoms. Dependency predicted increases in depressive symptoms regardless of the nature of negative events. Finally, in a 10-week prospective study of 79 seventh graders, Abela, Sakellaropoulou, and Taxel (2007) reported that self-criticism interacted with negative achievement, but not interpersonal, events to predict increases in depressive symptoms. Dependency, however, was not associated with increases in depressive symptoms following either achievement or interpersonal negative events.

Overall, support appears to be more apparent for the specificity hypothesis in youth with regard to dependency/sociotropy-related constructs than for self-criticism/autonomy-related constructs. In fact, most studies have reported support for the specificity of a single personality predisposition (for exceptions, see Hammen & Goodman-Brown, 1990). In addition, studies reporting effects for one predisposition or the other have often reported such effects to be gender specific, and these gender effects have not been consistent (e.g., Abela & Taylor, 2003; Little & Garber, 2000, 2004; Shahar et al., 2004). Thus, although support for the specificity hypothesis exists in youth, research findings are marred by vast inconsistencies related to which personality predispositions display them and in which gender.

THEORETICAL CONSIDERATIONS

A potential source of inconsistency in findings is that the two personality predispositions (i.e. interpersonal and achievement oriented) that have been proposed by theorists have not been observed to be orthogonal in child and adolescent samples. More specifically, correlations between interpersonal- and achievement-oriented personality predispositions in youth samples have ranged between .04 and .43 (Abela et al., 2007; Abela & Taylor, 2003; Little & Garber, 2000, 2004; Shahar et al., 2004; Shahar & Priel, 2003). Thus, participants displaying high levels of dependency in some studies may also have exhibited high levels of self-criticism, and vice versa. Consequently, high levels of dependency may appear to interact with negative achievement events to predict increases in depressive symptoms by virtue of being correlated with high levels of self-criticism. High levels of self-criticism may appear to interact with negative interpersonal events for the same reason. Although

researchers have traditionally examined the effect of each personality predisposition separately from one another, it is essential to control for the effect of the other personality predisposition to control for their common components and examine their unique effects. Unique effects of the personality predispositions to depression refer to the magnitude of their respective effects estimated while controlling for the effect of the other predisposition.

Additionally, designs aimed at identifying the moderating role of dependency and self-criticism in the association between stress and depressive symptoms have typically relied on a nomothetic approach to operationalizing high levels of stress (e.g., Segal et al., 1992). In such studies, personality predispositions and baseline depressive symptoms are assessed at Time 1, and stress is measured at Time 2 along with depressive symptoms. In such designs, an individual is deemed to have experienced a high level of stress when his or her stress level is greater than the sample's average. This conceptualization of stress may lead to erroneous predictions at the level of individual participants. For instance, an individual exhibiting a personality predisposition to depression may report a sharp increase in stress levels between Time 1 and Time 2 but nonetheless exhibit a stress level inferior to the sample's average. In this situation, theories of personality predispositions to depression would predict that such an individual would show increases in depressive symptoms, but a nomothetic operationalization of stress would yield the opposite prediction. Thus, the most powerful examination of the diathesis stress component of theories of personality predictions to depression should involve designs in which depressive symptoms and stress are assessed at multiple time points, and stress levels are operationalized idiographically. Such a conceptualization of stress implies that a given participant experiences high levels of stress when his or her stress levels are greater than his or her own average stress level. Tests of the general vulnerability hypothesis have yielded promising results when operationalizing stress from an idiographic rather than nomothetic perspective (Abela, Webb, Wagner, Ho, & Adams, 2006). When operationalizing stress from a nomothetic perspective in an adult sample, Abela, Webb, et al. (2006) found self-criticism to interact with non-domain-specific hassles to predict increases in depressive symptoms in individuals with low self-esteem, whereas dependency interacted with non-domain-specific hassles to predict elevations in depressive symptoms in individuals with high self-esteem. No such tests have been conducted in youth.

Conducting such tests in samples of youth is an important pursuit. The roles of dependency and self-criticism as vulnerability factors to depression may change over the

course of development, as dependency needs are normative and adaptive in childhood and early adolescence (e.g., Fichman, Koestner, & Zuroff, 1996). Dependency may confer vulnerability only later in development, when high levels of autonomy and low levels of dependency become adaptive. As for self-criticism, the pathway linking it to depression is proposed to be mediated by cognition. However, some authors have argued that cognitions only come to the fore as conferring vulnerability later in development (e.g., Nolen-Hoeksema, Girgus, & Seligman, 1992; Turner & Cole, 1994).

GOALS OF CURRENT STUDY

The current study used a multiwave longitudinal design to examine whether the personality predispositions of dependency and self-criticism act as vulnerability factors to the development of depressive symptoms in a sample of children and early adolescents. More specifically, we sought to examine whether higher levels of dependency and self-criticism were associated with greater increases in depressive symptoms following increases in general as well as domain-congruent hassles. The most powerful tests of vulnerability theories include multiwave longitudinal studies in which negative events and corresponding mood responses are measured repeatedly over time. Experience sampling methods (ESM) are well suited for this purpose. ESM has been shown to be a valid and practical means of assessing mood and cognition (Csikszentmihalyi & Larson, 1987; deVries, Dijkman-Caes, & Delespaul, 1990) and has been used in a range of community and clinical samples (e.g., Brown & Moskowitz, 1998; Cote & Moskowitz, 1998; deVries & Delespaul, 1989; deVries, Delespaul, & Dijkman, 1987; Zuroff et al., 1999). Participants are cued by signaling devices to complete self-report measures in real time, minimizing the recall bias associated with diary methods, as well as recall biases associated with depressogenic distortions. ESM is well suited to test the diathesis stress component of vulnerability theories because of its longitudinal nature. Moreover, ESM provides the numerous assessments per participant required to conduct analyses within an idiographic framework while permitting the examination of the influence of vulnerability factors on depressive symptoms across situations and within the flow of daily life.

During an initial assessment, children completed measures assessing dependency, self-criticism, depressive symptoms, and baseline levels of hassles. Hassles and depressive symptoms were measured six times for each participant at random times over the subsequent 2 months. We hypothesized that youth exhibiting high levels of dependency or self-criticism would report greater elevations in depressive symptoms following

elevations in hassles. Furthermore, we hypothesized that a general vulnerability framework would better account for the pattern of results in a sample of youth than a specific vulnerability framework.

METHOD

Participants

Participants in the current study were recruited from a sample taking part in a larger project examining vulnerability to depression in children of parents with a history of major depressive episodes (e.g., Abela, Hankin, et al., 2005; Abela, Skitch, Adams, & Hankin, 2006; Abela, Skitch, Auerbach, & Adams, 2005). Participants were recruited through ads placed in local English newspapers and posters placed in the Montreal area. Both posters and newspaper ads targeted parents with a history of major depressive disorder and children between the ages of 6 and 14 years. Respondents were screened during phone interviews using the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (SCID-I; First, Gibbon, Spitzer, & Williams, 2001). Parents who met criteria for current or past major depressive disorder were invited to participate in the study. The initial sample consisted of 102 parents (88 women) with 140 children (71 girls). Thirty-eight sibling pairs were included in this sample.

All children were given the opportunity to participate in a second portion of the project, namely, the current ESM study, and 56 accepted (45% female). Children's ages ranged from 7 to 14 years, with a mean age of 10.6 years. No sibling pairs participated in this second portion of the study. Of the 56 children participating in the second portion, 78.8% were Caucasian, 1.9% Native American, 1.9% Asian, and 17.3% Other. Children's mother tongue included English (72.2%), French (5.6%), and Other (22.2%). Parents' marital status was 56.9% married, 25.5% divorced, 9.8% separated, 2.0% single, and 5.9% other. The uppermost level of education completed by the parents was some high school for 3.9%, a high school diploma for 3.9%, some community college for 7.8%, a community college diploma for 11.8%, some university for 23.5%, a university diploma for 25.5%, and a graduate school diploma for 23.5%. The median family income ranged from \$30,000 to \$45,000. Children who chose to participate in the ESM portion of the study did not differ significantly from children who chose not to participate in age, $t(103) = 1.31$, *ns*; gender, $t(101) = .48$, *ns*; parental education, $t(97) = -.53$, *ns*; family income, $t(94) = -1.03$, *ns*; parental levels of depressive symptoms, $t(96) = -.22$, *ns*; levels of child depressive symptoms at baseline, $t(102) = 1.40$, *ns*; dependency, $t(101) = -1.14$, *ns*; or self-criticism, $t(101) = 1.16$, *ns*.

Procedure

Participants were recruited during the second and final in-lab assessment of the larger project described previously. During this assessment, children and parents signed consent to participate in the ESM portion of the study and completed the following measures: (a) Children's Depression Inventory (CDI; Kovacs, 1981), (b) Children's Depressive Experiences Questionnaire (CDEQ; Abela & Taylor, 2003), and (c) Children's Hassles Scale (CHAS; Kanner, Feldman, Weinberger, & Ford, 1987). Subsequently, children completed the CDI as well as the CHAS six times over 6 weeks. The children were provided with HP Jornada 720 handheld computers for the ESM portion of the study. These computers were equipped with a touch screen that allowed children to respond to questionnaires by using a stylus. Additionally, questionnaires were read aloud by the handheld computers, highlighting the words in the questionnaires to allow children to follow along. The handheld computers were programmed to emit a beeping sound, signaling the child to fill out the follow-up measures once per week at a random time over 6 weeks. The handheld computers were also personalized with the help of each child to ring only within predetermined times, such as between the return from school and bedtime.

Measures

CDI (Kovacs, 1981). The CDI is a 27-item self-report questionnaire that assesses the cognitive, affective, and behavioral symptoms of depression. For each item, children are asked to describe how they have been thinking and feeling in the past week. Total scores range from 0 to 52. The CDI possesses excellent internal consistency, adequate test-retest reliability, and sensitivity in distinguishing children with major depressive disorder from nondepressed children (Saylor, Finch, Spirito, & Bennett, 1984; Smucker, Craighead, Craighead, & Green, 1986). We obtained alphas ranging from .72 to .91 ($M = .82$) across seven administrations, indicating moderate to high internal consistency. Average test-retest reliability over the seven administrations was moderate to high ($r = .73$).

CDEQ (Abela & Taylor, 2003). The CDEQ is a 20-item measure that assesses dependency and self-criticism based on Blatt and Zuroff's (1992) theory of personality predispositions to depression. Examples of items from the dependency subscale include "I worry a lot about hurting other people's feelings" and "I feel I always have to be nice to people." Additionally, the self-criticism subscale contains items such as "I should do well at everything I do" and "making mistakes is okay because I can learn from them." Each of the two subscales (i.e., self-criticism and dependency) contains 10

items. For each item, participants are asked to indicate whether the statement is *not true*, *sort of true*, or *really true* for them. Composite scores on each subscale range from 0 to 20, with higher scores indicating higher levels of self-criticism and dependency, respectively. Past research has found strong internal consistency, test-retest reliability, and validity of the CDEQ subscales (e.g., Abela et al., 2007; Abela & Taylor, 2003). In the current study, an alpha of .39 was obtained for the dependency scale and an alpha of .58 was obtained for the self-criticism scale.

CHAS (Kanner et al., 1987). The CHAS is a list of 39 hassles and negative life events that children may experience. For each item, children are asked to rate how often they have experienced that event in the past week on a scale ranging from *never* to *all the time*. Total scores range from 39 to 195, with higher scores indicating the occurrence of a greater number of hassles. To avoid confounding the assessment of negative life events and depressive symptoms, only items that focused on specific external events were included on the CHAS (Kanner et al., 1987). The CHAS has been shown to be a predictor of residual change in depressive symptoms over time and is associated with a multitude of measures assessing negative life events including the Coddington Life Event Scale (Coddington, 1972) and the Childhood Trauma Questionnaire (Bernstein & Fink, 1998). In the present study, we obtained alphas ranging from .87 to .97 ($M = .93$) across seven administrations, indicating high internal consistency. Average test-retest reliability across the six administrations was moderate to high ($r = .65$). To create domain-specific hassles scores, the 39 items were classified as interpersonal, achievement, neither interpersonal nor achievement, or both interpersonal and achievement by four independent raters who achieved 95% agreement. Only items on which the raters agreed were used in the final scales. Nineteen of the items were classified as interpersonal (e.g., "Kids at school teased you" and "Your best friend didn't want to be your best friend anymore") and 10 items were classified as achievement (e.g., "Your schoolwork was too hard" and "You didn't do well at sports"). Scores on the interpersonal hassles subscale of the CHAS ranged from 19 to 95, and scores on the achievement hassles subscale ranged from 10 to 50.

RESULTS

Descriptive Data

Means, standard deviations, and intercorrelations for all Time 1 measures are presented in Table 1. Means and standard deviations for CDI and CHAS scores across the six follow-up assessments are presented in

TABLE 1: Means, Standard Deviations, and Intercorrelations Between Children's Gender, Age, and Initial Assessment Measures

	1	2	3	4	5	6
1. CDI	5.74 (4.27)					
2. CHAS	.21	50.41 (16.49)				
3. CDEQ-DEP	.07	.00	4.66 (1.85)			
4. CDEQ-SC	.25	.16	.12	3.19 (2.11)		
5. Age	.05	.43**	-.11	-.09	10.62 (2.01)	
6. Gender	.07	.02	-.06	.19	-.09	0.45 (0.50)

NOTE: CDI = Children's Depression Inventory; CHAS = Children's Hassles Scale; CDEQ-DEP = Children's Depressive Experiences Questionnaire, Dependency Subscale; CDEQ-SC = Children's Depressive Experiences Questionnaire, Self-Criticism Subscale.

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

TABLE 2: Means and Standard Deviations of Children's Depressive Symptoms and Hassles Over Six Follow-Up Assessments

	1	2	3	4	5	6
CDI						
M	7.16	6.33	7.65	6.70	8.84	8.92
SD	5.60	4.69	6.76	5.58	9.08	9.41
CHAS						
M	33.89	33.04	34.39	31.36	34.71	31.00
SD	16.57	18.83	23.81	23.89	28.76	24.46
CHAS-INT						
M	15.50	15.24	16.40	14.93	16.32	14.75
SD	8.86	9.35	12.87	12.21	15.47	13.31
CHAS-ACH						
M	9.35	8.43	9.02	8.14	9.07	8.03
SD	4.81	5.61	6.88	7.09	8.44	7.47

NOTE: CDI = Children's Depression Inventory; CHAS = Children's Hassles Scale; CHAS-INT = Children's Hassles Scale, Interpersonal Subscale; CHAS-ACH = Children's Hassles Scale, Achievement Subscale.

Table 2. In line with the adoption of an idiographic framework, each child had his or her own mean level of depressive symptoms (or average CDI score) as well as his or her own degree of variation (or standard deviation in CDI scores) in depressive symptoms during the follow-up interval. Additionally, each child had his or her own mean level of hassles (or average CHAS score) as well as his or her own degree of variation in hassles during the follow-up interval (or standard deviation in CHAS scores). Children's means on the CDI over the initial assessment and six follow-ups ranged from 0 to

25.00 ($M = 7.29$, $SD = 6.05$), and children's standard deviations ranged from 0 to 15.98 ($M = 3.02$, $SD = 2.67$). Children's means on the CHAS over the initial assessment and six follow-ups ranged from 1.39 to 95.00 ($M = 45.16$, $SD = 20.38$), and children's standard deviations ranged from 0 to 51.62 ($M = 14.54$, $SD = 9.40$). It is important to note that when interpersonal and achievement subscales were derived from the CHAS, they yielded a correlation of $r = .76$, suggesting that the two domains could not be meaningfully separated in the current sample. A test of the specificity hypothesis was nonetheless examined in the current sample.

Differences in mean within-subject levels of depressive symptoms across the six administrations between participants displaying high and low levels of dependency and self-criticism were examined using a mean split. Participants with high and low levels of dependency did not differ significantly in their mean levels of within-subject depressive symptoms over the follow-up interval, $F(1, 51) = .66$, ns . However, participants displaying low levels of self-criticism reported significantly greater mean within-subject levels of depressive symptoms over the follow-up interval, $F(1, 51) = 6.07$, $p < .05$.

The Diathesis Stress Hypothesis

To test our hypothesis that children possessing high levels of either dependency or self-criticism would report greater elevations in depressive symptoms following elevations in hassles than children possessing low levels of such variables, we used multilevel modeling. Analyses were carried out using the SAS (version 9.1) MIXED procedure and maximum likelihood estimation. Our dependent variable was within-subject fluctuations in CDI scores during the follow-up interval (FU_CDI). It is important to note that the term *fluctuations* is not meant to refer to participants' standard deviations within repeated administrations of measures but rather to elevations and decreases in scores within participants on these repeated measures. Our primary predictors of FU_CDI were dependency (CDEQ-DEP), self-criticism (CDEQ-SC), and fluctuations in scores on the CHAS during the follow-up interval (HASSLES). As CDEQ-DEP and CDEQ-SC scores are between-subject predictors, CDEQ-DEP and CDEQ-SC scores were standardized before analyses. As HASSLES is a within-subject predictor, HASSLES scores were centered at each participant's mean before analyses such that HASSLES reflects upward or downward fluctuations in adult level of hassles compared to his or her mean level of hassles.

For all analyses presented, preliminary models were first examined testing whether Time 1 CDI scores served as a moderator of any relationships to test the assumption of homogeneity of covariance (see Joiner, 1994).

No significant interactions involving Time 1 CDI scores were found. Consequently, for the sake of simplicity, results are presented only for models including CDEQ-DEP, CDEQ-SC, and HASSLES.

When fitting hierarchical linear models, appropriate mean and covariance structures must be specified. Mean and covariance structures are not independent of one another. Rather, an appropriate covariance structure is essential to obtain valid inferences for the parameters in the mean structure. Overparametrization of the covariance structure can lead to inefficient estimation and poor assessment of standard errors (Altham, 1984). On the other hand, too much restriction of the covariance structure can lead to invalid inferences when the assumed structure does not hold (Altham, 1984).

We were interested in examining the effects of CDEQ-DEP, CDEQ-SC, and HASSLES on children’s CDI scores during the follow-up interval. Consequently, in line with Diggle, Liang, and Zeger’s (1994) recommendation that one use a “saturated” model for the mean structure while searching for an appropriate covariance structure, we chose a mean structure that included CDEQ-DEP, CDEQ-SC, HASSLES, interpersonal subscale of CHAS (HASSLES-I), achievement subscale of the CHAS (HASSLES-A), and two-way interactions involving (a) CDEQ-DEP and HASSLES, (b) CDEQ-DEP and HASSLES-I, (c) CDEQ-DEP and HASSLES-A, (d) CDEQ-SC and HASSLES, (e) CDEQ-SC and HASSLES-I, and (f) CDEQ-SC and HASSLES-A. Three additional effects were also included in this initial mean structure. First, to control for individual differences in baseline levels of depressive symptoms, children’s Time 1 CDI scores (T1_CDI) were included in the model. Second, to account for individual variability in the average level of depressive symptoms at an individual’s mean level of hassles, a random effect for intercept (RE_INTERCEPT) was included in the model. Finally, given that HASSLES is a within-subject predictor whose effect is expected to vary from participant to participant, a random effect for slope (RE_SLOPE) was included in the model.

Commonly used covariance structures in studies in which multiple responses are obtained from the same individual over time (and consequently within-subject residuals over time are likely to be correlated) include compound symmetry, first-order autoregressive, heterogeneous autoregressive, and banded Toeplitz. To select one of these covariance structures for our analyses, we fitted models using each structure and chose the “best” fit based on Akaike information criterion (AIC and AICC, an AIC estimate corrected for small sample sizes) and Schwarz Bayesian information criterion (BIC). AIC, AICC, and BIC represent Bayesian estimates of fit. Whereas AIC and AICC are typically used to minimize error, BIC is typically used to yield more interpretable estimates. Smaller values of AIC, AICC, or BIC suggest

TABLE 3: Values of Indices of Fit for Each Covariance Structure Examined

<i>Covariance Structure</i>	<i>AIC</i>	<i>AICC</i>	<i>BIC</i>
AR	1,251.4	1,253.8	1,279.4
ARH	1,225.9 ^a	1,230.4 ^a	1,263.4 ^a
CS	1,254.1	1,256.6	1,282.2
TOEP(1)	1,252.1	1,254.3	1,278.3
TOEP(2)	1,252.2	1,254.6	1,280.2

Note: AIC = Akaike information criterion; AICC = Akaike information criterion corrected for small sample sizes; BIC = Schwarz Bayesian information criterion; AR = autoregressive; ARH = heterogeneous autoregressive; CS = compound symmetry; TOEP(1) = Banded Toeplitz 1; TOEP(2) = Banded Topelitz 2.
a. Indicates the best fit.

TABLE 4: Hierarchical Linear Modeling Analyses: Predicting Fluctuations in CDI Scores During the Follow-Up Interval

<i>Predictor</i>	<i>b</i>	<i>SE</i>	<i>F</i>	<i>df</i>
Time 1 CDI	2.49	.45	30.64***	1, 46
CDEQ-DEP	-1.32	.55	5.89*	1, 46
CDEQ-SC	-0.96	.64	2.23	1, 46
HASSLES	0.10	.02	24.63***	1, 198
CDEQ-DEP × HASSLES	0.04	.02	3.94*	1, 198
CDEQ-SC × HASSLES	0.05	.02	7.23**	1, 198

NOTE: CDI = Children’s Depression Inventory; CDEQ-DEP = Children’s Depressive Experiences Questionnaire, Dependency Subscale; CDEQ-SC = Children’s Depressive Experiences Questionnaire, Self-Criticism Subscale; HASSLES = Children’s Hassles Scale (CHAS).
p* < .05. *p* < .01. ****p* < .001.

better fit when comparing models. Indices of fit for each covariance structure obtained while testing a model containing all two-way interactions tested in the current study involving CDEQ-DEP, CDEQ-SC, HASSLES, HASSLES-I, and HASSLES-A as effects for T1_CDI, and random effects for the slope and the intercept are reported in Table 3. The best fit was a heterogeneous autoregressive structure (see Littell, Pendergast, & Natarajan, 2000). Such a covariance structure indicates two general patterns in CDI scores during the follow-up interval (for further explanation, see Littell et al., 2000). First, as the interval between any two follow-up assessments increases, the degree of intercorrelation between children’s CDI scores at these two time points decreases (i.e., CDI scores obtained at Follow-Up 4 are more strongly associated with CDI scores obtained at Follow-Ups 3 and 5 than with CDI scores obtained at Follow-Ups 2 and 6). Second, the variance in CDI scores across administrations is not constant (i.e., variance in CDI scores is greater at some follow-up assessments than at others).

After choosing the appropriate covariance structure, we next examined the random-effects component of our

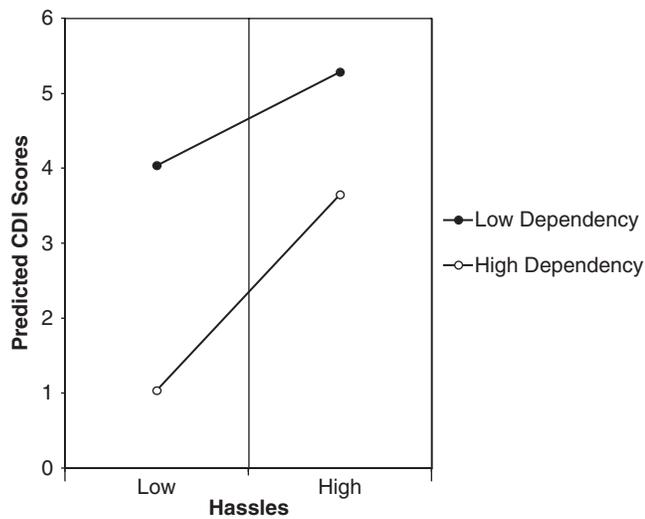


Figure 1 Predicted slope of the relation between hassles and depressive symptoms for children displaying high or low levels of dependency.

NOTE: CDI = Children's Depression Inventory.

model. With respect to random effects, RE_SLOPE was significant ($b = 8.85$, $SE = 2.65$, $z = 3.34$, $p < .001$) and consequently was retained in the analyses. Although RE_INTERCEPT was not significant ($b = 1.58$, $SE = 1.97$, $z = .80$, ns), it was nonetheless retained in the model to provide a more stringent test of hypotheses. The ARH(1) parameter was significant ($b = .32$, $SE = .14$, $z = 2.20$, $p < .05$) and was included in the final models. Coefficients for fixed effects are interpreted as the increase in FU_CDI expected as a result of increasing the independent variable by 1 point on the scale for between-subject variables and by 1 *SD* for within-subject variables.

The General Vulnerability Hypothesis

An initial model in which HASSLES was used as a predictor in interaction with both CDEQ-D and CDEQ-SC was used to test predictions made according to a general vulnerability framework. Results with respect to the fixed-effects component of the model are presented in Table 4. Of primary importance, a significant two-way, cross-level interaction emerged between CDEQ-DEP and HASSLES. To examine the form the CDEQ-DEP \times HASSLES interaction, the model summarized in Table 3 was used to calculate predicted CDI scores for children possessing either low or high levels of dependency (plus or minus 1 *SD*) who are experiencing either low or high levels of hassles in comparison to their own average level of hassles (Plus or Minus 1 *SD* \times Mean Within-Subject Standard Deviation). The results of these calculations are presented in Figure 1. As both FU_CDI and HASSLES

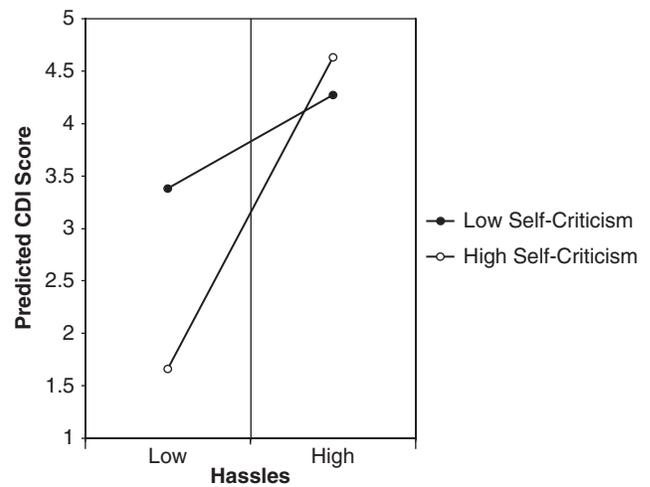


Figure 2 Predicted slope of the relation between hassles and depressive symptoms for children displaying high or low levels of self-criticism.

NOTE: CDI = Children's Depression Inventory.

are within-subject variables centered at each participant's mean, slopes are interpreted as the increase in a participant's CDI score that would be expected given that he or she scored 1 point higher on the CHAS.

Analyses were conducted for each CDEQ-DEP \times HASSLES condition examining whether the slope of the relation between hassles and depressive symptoms significantly differed from zero. The slope of the relation between hassles and depressive symptoms was significantly different from zero for both children with low, $t(198) = 2.78$, $p < .01$, and high, $t(198) = 4.49$, $p < .001$, levels of dependency. Moreover, the slope of this relation differed significantly between children with low and high levels of dependency, $t(198) = 1.98$, $p < .05$.

Additionally, a significant two-way, cross-level interaction emerged between CDEQ-SC and HASSLES. The same data analytic approach outlined previously was used to examine this interaction. The results of these calculations with regard to the CDEQ-SC \times HASSLES interaction are presented in Figure 2. As both FU_CDI and HASSLES are within-subject variables centered at each participant's mean, slopes are interpreted as the increase in a participant's CDI score that would be expected given that he or she scored 1 point higher on the CHAS. The slope of the relation between hassles and depressive symptoms was not significantly different from zero for children with low, $t(198) = 1.51$, $p < .01$, levels of self-criticism. However, the slope of the relation between hassles and depressive symptoms was significantly different from zero for children with high, $t(198) = 5.95$, $p < .001$, levels of self-criticism. Moreover,

the slope of this relation differed significantly between children with low and high levels of self-criticism, $t(198) = 2.69, p < .01$.

The Specific Vulnerability Hypothesis

Four additional models that used HASSLES-I and HASSLES-A were used to test the specific vulnerability hypothesis. To meet the requirements of specific vulnerability, a given personality predisposition would need to interact with domain-congruent, but not domain-incongruent, hassles to predict fluctuations in depressive symptoms. Thus, models were tested including each personality predisposition in interaction with domain-congruent and domain-incongruent hassles. None of these interactions, including two-way interactions between CDEQ-D and HASSLES-I ($b = -.08, SE = .04, F = 3.28, df = 1, 161, ns$), CDEQ-D and HASSLES-A ($b = -.10, SE = .06, F = 3.19, df = 1, 161, ns$), CDEQ-SC and HASSLES-I ($b = -.03, SE = .03, F = 1.49, df = 1, 161, ns$), or CDEQ-SC and HASSLES-A ($b = -.02, SE = .04, F = .28, df = 1, 161, ns$), emerged as statistically significant predictors of fluctuations in depressive symptoms over the follow-up interval.

In summary, participants with high levels of self-criticism displayed greater increases in depressive symptoms following increases in general hassles than participants with low levels of self-criticism when controlling for participants' levels of dependency. Similarly, participants with high levels of dependency displayed greater increases in depressive symptoms following increases in general hassles than participants with low levels of dependency when controlling for participants' levels of self-criticism. Thus, support was found for the general vulnerability hypothesis, but no support was found for the specific vulnerability hypothesis.

DISCUSSION

The results of the current study support our hypothesis that youth exhibiting high levels of dependency or self-criticism would report greater elevations in depressive symptoms following elevations in hassles than children with low levels of these personality predispositions. These results can be interpreted within a framework of stress reactivity, suggesting that children exhibiting high levels of personality predispositions to depression may be more sensitive to daily fluctuations in stress, and more likely to show increases in depressive symptoms following increases in stress.

Whereas past research has conceptualized stress nomothetically, the current study used an idiographic conceptualization of stress. In other words, whereas past research has focused on the role of the cumulative effect of stress,

the current study examined the role of changes in levels of stress. Research conducted by Blatt and Zuroff (1992) examining theoretical formulations of personality predispositions to depression suggests that vulnerable individuals will exhibit increases in depressive symptoms following the occurrence of stress rather than following absolute high levels of stress. Consequently, the slope of the relation between stress and depressive symptoms is expected to vary as a function of individuals' levels of vulnerability. Thus, individuals possessing high levels of personality vulnerability are expected to be more stress reactive than individuals possessing low levels of personality vulnerability. Moreover, this framework allows the conceptualization of personality vulnerabilities in a manner consistent with recent accounts of personality traits as both stable and dynamic (Brown & Moskowitz, 1998). According to this perspective, although personality traits represent individual characteristics that persist over time, their behavioural and affective expressions vary over time as a function of situational circumstances, therefore allowing for theoretical models to incorporate individuals' contexts.

In addition, the results of the current study suggest that dependency and self-criticism represent distinct vulnerability factors to depression in youth. Dependency and self-criticism both remained significant predictors of fluctuations in levels of depressive symptoms in interaction with levels of hassles when controlling for the other personality predisposition. Consequently, future research should control for other personality predispositions when examining the role of dependency or self-criticism. Few studies have controlled for the effect of the other personality predisposition when examining the role of either dependency or self-criticism. However, when such precautions were taken, support was found for both personality predispositions (Abela, Webb, et al., 2006). In light of the current findings, not controlling for the other personality predisposition would yield results that are difficult to interpret. Indeed, past findings failing to find support for the specificity hypothesis could have been caused by failure to take into consideration the correlation between dependency and self-criticism.

Furthermore, results of the current study suggest that a general vulnerability framework may be more useful in conceptualizing the roles of personality predispositions to depression as vulnerability factors than a specific vulnerability framework. This is consistent with research in adult populations, according to which levels of depressive symptoms may be best predicted by overall levels of stress in adults and youth rather than domain-specific levels of stress (Blaney, 2000; Shahar et al., 2004). As suggested by Abela, Webb, et al. (2006), it is likely that individuals of all ages appraise negative events in ways that are consistent with their personality

profiles. Thus, dependent individuals may be apt to give an interpersonal meaning to events construed by others as achievement related, and self-critical individuals may give an achievement meaning to events construed by others as interpersonal. Moreover, it is plausible that this is particularly the case in childhood and adolescence. Indeed, the complexity of children's self concept has been observed to increase markedly through middle childhood (e.g. Abela & Veronneau-McArdle, 2002). As children mature, they may become more sensitive to the differentiation between the various domains of their lives. In young children, however, interpersonal or achievement stressors may affect similar, undifferentiated self-aspects. Thus, categorizing hassles and negative events may not reflect adequately the overall level of stress in children and adolescents' lives. Past studies that have separated achievement and interpersonal stressors have generally not reported the correlation between them, and this separation may not have been empirically valid. When such correlations were reported in youth samples, correlations ranged from .03 to .76 (Abela et al., 2007; Abela & Taylor, 2003; Little & Garber, 2000, 2004, 2005; Shahar et al., 2004; Shahar & Priel, 2003). Consequently, future studies should engage in tests of specific vulnerability cautiously and only when stressors can be reliably classified and empirically distinguishable. Furthermore, future research should compare results obtained within a specific-vulnerability framework with those obtained in a general-vulnerability framework. This may be best accomplished by using both domain-specific measures of hassles or negative events and general measures of hassles.

To our knowledge, this is the first study with a youth sample to find prospective support for both personality predispositions while conceptualizing stress idiographically, controlling for both personality predispositions, and using ESM. At the same time, several limitations of the current study must be highlighted. First, levels of depressive symptoms and hassles were assessed using a self-report questionnaire. Although the CDI is a reliable and valid instrument, it does not allow us to make conclusions about clinically significant levels of depressive symptoms.

Second, more sophisticated methods of assessing stress may provide more precise measurements. Future research should use semistructured clinical interviews to assess levels of depressive symptomatology, depressive disorder diagnoses, and stress.

Third, the present sample was recruited from a sample of children of depressed parents. Although previous studies (e.g. Abela & Taylor, 2003) have suggested that dependency may be normative and adaptive in children, it may not be the case for children of depressed parents. Indeed, dependent children may be successful at deriving

feelings of self-worth and validation from healthy parents. It is conceivable, however, that dependent children may not obtain similar benefits from depressed parents when seeking validation or affection. Consistent with this proposition, past research suggests that depressed mothers display parenting styles associated with guilt- and anxiety-inducing control strategies and greater levels of expressed disappointment toward their children (Cicchetti & Toth, 1991). Additionally, depressed mothers have been found to appraise their children's behavior more negatively than nondepressed mothers (Brody, McBride Murry, Kim, & Brown, 2002). Although maladaptive parenting styles associated with mental illness may place any adolescent at greater risk of becoming depressed (Oyserman, Bybee, & Mowbray, 2002), the risk may be compounded for children looking to their caregivers to maintain their feelings of self-worth. Although such a sample provides a strong test of theories of vulnerability by increasing the likelihood of participants exhibiting elevations in depressive symptoms during the follow-up period, results cannot be generalized to low-risk populations. Future research on the role of dependency and self-criticism as personality predispositions to depression in youth should be conducted in low-risk community samples.

Fourth, analyses were conducted in a relatively small sample. Although ESM allowed the examination of up to seven time points for each participant, future research should replicate these findings in a larger sample. This would allow an examination of additional moderators of the relation between personality predispositions to depression, hassles, and depressive symptoms, such as low self-esteem (Abela, Webb, et al., 2006).

Fifth, the size of the current sample did not allow examination of gender differences in the relation between personality predispositions to depression, negative life events, and depressive symptoms. Past research has consistently found gender differences in prevalence rates of episodes of depression beginning in early adolescence (for a review, see Hankin & Abramson, 2001). Moreover, these differences are evidenced when examining sub-syndromal depressive symptomatology (Petersen et al., 1993). Moreover, past research examining personality predispositions to depression in youth have reported gender-specific effects (e.g., Abela & Taylor, 2003; Little & Garber, 2004). Future research should therefore rely on designs allowing for the examination of gender-specific mechanisms relating personality predispositions to depression through the moderating role of negative life events.

Last, the current design did not make it possible to contrast cognitive (Beck, 1983) and psychodynamic (Blatt & Zuroff, 1992) conceptualizations of personality predispositions to depression. Future research should address

this limitation by including measures of both types of constructs to determine whether they are associated with changes in levels of depressive symptoms through similar mechanisms.

In conclusion, consistent with our hypotheses, high levels of dependency and self-criticism were associated with increases in depressive symptoms following increases in hassles in a sample of youth. The identification of personality predispositions to depression in youth represents an important step in increasing our understanding of factors that make youth more vulnerable to the negative effect of stress and precipitate recurring depressive episodes. These factors can in turn be used by clinicians to identify children and adolescents vulnerable to future episodes of depression and target specific mechanisms in treatment. Future research that uses more sophisticated and diverse assessment tools and large low-risk community samples, and that examines a variety of disorders will likely increase our understanding of the relation among dependency, self-criticism, stress, and depression.

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Received February 10, 2008

Revision accepted April 17, 2009