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Toward an interpersonal life-stress model of depression: The developmental context of stress generation

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Abstract
The validity of a developmentally based life-stress model of depression was evaluated in 88 clinic-referred youngsters. The model focused on (a) the role of child–environment transactions, (b) the specificity of stress–psychopathology relations, and (c) the consideration of both episodic and chronic stress. Semistructured diagnostic and life-stress interviews were administered to youngsters and their parents. As predicted, in the total sample child depression was associated with *interpersonal* episodic and chronic stress, whereas externalizing disorder was associated with *noninterpersonal* episodic and chronic stress. However, the pattern of results differed somewhat in boys and girls. Youngsters with comorbid depression and externalizing disorder tended to experience the highest stress levels. Support was obtained for a stress-generation model of depression, wherein children precipitate stressful events and circumstances. In fact, stress that was in part dependent on children's contribution distinguished best among diagnostic groups, whereas independent stress had little discriminative power. Results suggest that life-stress research may benefit from the application of transactional models of developmental psychopathology, which consider how children participate in the construction of stressful environments.

Stress and coping models of developmental psychopathology have begun to assume a central position in the child depression literature. Initial life-stress conceptualizations implicated exposure to stressful events as a risk factor for the emergence, perpetuation, and recurrence of depressive disorders. In support of this view, a growing body of empirical research has revealed consistent, albeit fairly modest, associations between the experience of stressful life events and depression in youngsters (Burt, Cohen, & Bjorck, 1988; Goodyer & Altham, 1991; Hops, Lewinsohn, Andrews, & Roberts, 1990; Swearingen & Cohen, 1985; reviewed in Compas, Grant, & Ey, 1994; Garber & Hilsman, 1992). However, existing life-stress models often are characterized by an adevelopmental perspective that does not account for the dynamic interface between stress and psychopathology over time. Furthermore, critiques of the life-stress literature (e.g., Cohen & Park, 1992; Compas et al., 1994; Hammen & Rudolph, 1996; Johnson, 1982) have raised many empirical and methodological questions that warrant further attention in the next generation of life-stress research.

The present study evaluated a life-stress

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model of depression that addresses three conceptual areas of concern. First, the model conceptualizes the stress–depression relationship within a developmental context. Second, the model hypothesizes specific associations between certain types of life stress and psychopathology. In particular, the model highlights the interpersonal context of child depression. Third, the model considers the role of chronic stressful circumstances in child depression. A sophisticated methodological approach was used to overcome several limitations in the extant child life-stress literature.

Developmental Context of Life Stress and Depression

The model guiding this research incorporates principles derived from a developmental psychopathology framework to conceptualize the relationship between life stress and depression. A critical tenet of the developmental psychopathology paradigm is its emphasis on a transactional approach to development (Cicchetti, Rogosch, & Toth, 1994; Cicchetti & Schneider–Rosen, 1984; Kazdin & Kagan, 1994). A transactional perspective challenges traditional notions of children as passive recipients of experiences and emphasizes the reciprocal influences between children and their environments. For example, in a recent conceptualization of the role of social context in the development of psychopathology, Boyce and colleagues (1998) noted the importance of mutual determination, or the continuous exchanges between individuals and their social contexts that guide the course of development. Furthermore, these authors emphasized the need to identify "modalities of influence," or the processes by which children and their environments exert transactional effects.

The present research builds on existing life-stress models by adopting a transactional, developmental perspective that considers the mechanisms through which children contribute to their environments. Specifically, traditional stress-exposure models conceptualize depression merely as a *reaction* to stress and, therefore, highlight the impact of context on children's development. Accordingly, examination of these models has emphasized the role of "fateful" or *independent* life events—that is, events beyond one's control—and has focused on the unidirectional prediction of depression from prior stress (e.g., Ge, Lorenz, Conger, Elder, & Simons, 1994; Hilsman & Garber, 1995). In contrast, the present study evaluated a complementary stress-generation model (Hammen, 1991, 1992b), which postulates that depressive symptoms and associated impairment actually may cause individuals to *precipitate* stress, which in turn may trigger future depression. The latter model therefore views the stress–depression relationship as fluid and changing across development, with stress serving as both an etiologic factor and a potential consequence of disorder. Capturing these person–environment transactions requires a consideration of the role of *dependent* stressors—that is, events to which one contributes—and the examination of bidirectional relations between stress and depression (e.g., Daley et al., 1997; Hammen, 1991).

Understanding the association between individuals' contributions to the stressful circumstances in which they live and their experience of psychopathology is particularly important in youth, given that early life experiences set the stage for future adaptive or maladaptive functioning (see Harrington, Rutter, & Fombonne, 1996). Moreover, adopting a transactional approach may help to elucidate the mechanisms underlying the continuity of depression across the life span. Early onset of depression has been associated in both clinical and community samples with a chronic or recurring course of disorder and with ongoing impairment in functioning (Geller, 1993; Ialongo, Edelsohn, Werthamer–Larsson, Crockett, & Kellam, 1993; Kovacs, 1989; Rao et al., 1995). Yet little is known about the processes that account for this observed developmental trajectory. The stress-generation process may explain in part this self-perpetuating cycle, wherein disorder-induced impairment or stable characteristics of depression-prone youth create a stressful environment that places them at further risk. In fact, as the consequences of depression and associated impairment accumulate across development in the form of dependent stress, lower levels of independent stress may be necessary to pre-

cipitate future episodes. One of the primary goals of this study was therefore to examine an expanded, developmentally based conceptualization of life stress that considers how children contribute to the construction of stressful environments.

Interpersonal Context of Depression

A second goal of the present research was to evaluate the validity of a depression-specific life-stress model. Whereas existing models typically have concentrated on global linkages between stress and child depression, the present conceptualization emphasizes the interpersonal origins and consequences of depression. Developmental psychopathology theories of depression (Cicchetti et al., 1994; Cicchetti & Toth, 1998; Cummings & Cicchetti, 1990; Gotlib & Hammen, 1992; Hammen, 1992a; Hammen & Rudolph, 1996) have implicated interpersonal stress and disruption, such as disturbed parent–child attachment, dysfunctional family relationships, and interpersonal conflict, as specific vulnerability factors for depression. The presumption of such models is that aversive or stressful interpersonal experiences may interfere with the achievement of normative developmental tasks that emerge in the context of adaptive relationships, such as the formation of a healthy sense of self and the capacity for effective emotion regulation. For example, exposure to interpersonal stress may lead to the internalization of maladaptive beliefs about the self and relationships, such as a diminished sense of self-worth, decreased perceptions of competence and control, negative attributions, and a tendency to focus on negative aspects of interpersonal situations. High levels of interpersonal stress also may overwhelm children's resources and thereby contribute to a sense of helplessness and problematic coping styles. Dysfunction in social-cognitive, affective, and behavioral systems stemming from interpersonal stress may then place children at risk for depression. In turn, depression may foster aversive and conflictual interpersonal encounters or disengagement from the social environment, causing further deterioration in relationships and the generation of additional interpersonal stress. Thus, interpersonal stress and depression may be intimately linked in a transactional relationship over the course of development.

An interpersonal emphasis also is reflected in many contemporary models of adult depression, which focus on impaired relationships as critical antecedents and sequelae of depression (e.g., Coyne, 1976; Lewinsohn, 1974; reviewed in Gotlib & Hammen, 1992). However, the disruption of interpersonal relationships may exert particulary deterimental effects during childhood and adolescence by undermining cognitive, affective, and behavioral processes during critical periods of growth and development. The link between interpersonal stress and depression may be especially salient in girls during middle childhood and adolescence. The higher investment placed by girls in relationships as a source of support and intimacy may heighten their vulnerability to interpersonal stress (Fenzel & Blyth, 1986; Laursen, 1996; Nolen–Hoeksema & Girgus, 1994; Rudolph & Hammen, 1999; Simmons, Burgeson, Carlton–Ford, & Blyth, 1987) and may increase their likelihood of generating stress in their relationships (Rudolph & Hammen, 1999).

Reflecting the conceptual generality of existing life-stress models, empirical tests examining the specificity of depression versus other forms of psychopathology both as precursors and as consequences of stress are relatively scarce (Compas et al., 1994). Studies that have examined directly the specificity of stress–depression links often have demonstrated that the observed association extends to other domains of psychopathology, including anxiety and externalizing behavior problems (Burt et al., 1988; Compas, Howell, Phares, Williams, & Giunta, 1989; Compas, Slavin, Wagner, & Vannatta, 1986; Daniels & Moos, 1990; Goodyer & Altham, 1991; Goodyer, Herbert, Tamplin, Secher, & Pearson, 1997; reviewed in Compas et al., 1994; Hammen & Rudolph, 1996). This lack of specificity is not surprising, given that most research to date has been based on aggregate measures of stress and, often, on nonspecific measures of psychopathology.

Now that global relationships between stress and disorder have been well-docu-

mented, more fine-grained analyses are needed to examine the differential relations between particular subtypes of stressors and particular subtypes of psychopathology (Compas et al., 1994; Ge et al., 1994; Jensen, Richters, Ussery, Bloedau, & Davis, 1991; Quamma & Greenberg, 1994). Consistent with the interpersonal focus of the proposed model, depression has been linked to interpersonal stressors (e.g., bereavement or loss, separation from significant others), disturbed family relationships (e.g., parent–child and marital dysfunction), and peer difficulties in adults (Barnett & Gotlib, 1988; Brown & Harris, 1978; Coyne, 1976; reviewed in Gotlib & Hammen, 1992) and in youth (Altmann & Gotlib, 1988; Goodyer & Altham, 1991; Rudolph, Hammen, & Burge, 1994; reviewed in Hammen & Rudolph, 1996).

Although some evidence also has been found for associations between depressive symptoms and noninterpersonal stressors, such as academic impairment (e.g., Cole, 1991; Forehand, Brody, Long, & Fauber, 1988; Ialongo, Edelsohn, Werthamer–Larsson, Crockett, & Kellam, 1996; Kellam, Rebok, Mayer, Ialongo, & Kalodner, 1994; Lefkowitz & Tesiny, 1985) or perceived academic failure and incompetence (e.g., Harter & Whitesell, 1996; Hilsman & Garber, 1995; Weisz, Sweeney, Proffitt, & Carr, 1994), studies that have directly compared interpersonal and noninterpersonal domains have revealed a preponderance of interpersonal difficulties in depressed youngsters. For instance, depression in adolescents has been linked more strongly to events involving interpersonal themes rather than self incompetence (Renouf & Harter, 1990). Additionally, children classified as having interpersonally focused self-schemas, in comparison to achievement-focused self-schemas, have been found to be especially vulnerable to depression (Hammen & Goodman–Brown, 1990). In studies evaluating dual social and academic competence models, peer rejection has emerged as a stronger and more consistent predictor than academic impairment of depressive symptoms (Blechman, McEnroe, Carella, & Audette, 1986; Patterson & Stoolmiller, 1991). Some evidence even has suggested that the negative self-perceptions of academic competence displayed by depressed children may be inaccurate (e.g., Meyer, Dyck, & Petrinack, 1989), calling into question findings that are based on self-report. Furthermore, studies that have indicated perceived or actual academic incompetence in depressed children typically have not controlled for co-occurring externalizing problems, which have been linked to a variety of stressors in noninterpersonal domains, including academic failure (reviewed in Hinshaw & Anderson, 1996), and have not included systematic assessments of life stress across multiple domains. Finally, these studies often have relied on self-report measures of symptoms that may confound depression with other types of distress (see Weisz, Rudolph, Granger, & Sweeney, 1992, for a review of studies on the link between academic and behavioral impairment and depression).

The second aim of the present study, therefore, was to examine whether stress in specific life domains was associated differentially with specific forms of psychopathology. The strongest evidence for a depression-specific model would be gained if two criteria were met: (a) depression is associated more strongly with stress in certain life domains than in other life domains, and (b) stress in a particular life domain(s) is associated more strongly with depression than with other forms of psychopathology. Mapping onto these criteria, we predicted that (a) depression would be correlated more strongly with interpersonal stressors (e.g., difficulties with family or friends) than with noninterpersonal stressors (e.g., academic problems or events resulting from antisocial conduct), and (b) interpersonal stressors would be correlated more strongly with depression than with externalizing disorders.

A related goal was to consider how the presence of comorbid psychopathology may influence findings regarding the link between stress and depression. Although comorbidity often has been overlooked in prior life stress research, the high rate of co-occurring disorders in depressed preadolescents and adolescents (see Angold & Costello, 1993; Angold, Costello, & Erkanli, 1999; Hammen & Com-

pas, 1994; Hammen & Rudolph, 1996) has significant implications for understanding the role of life stress in child depression. First, previously reported modest correlations and lack of specificity may be due in part to diagnostic heterogeneity within groups of depressed children. Second, conceptual models of depression must account for comorbidity. For instance, comorbid disorder may be associated with the experience of higher *levels* of stress than pure depression (e.g., Daley et al., 1997) or with the presence of co-occurring risk factors (Hammen & Compas, 1994), such as the experience of diverse *types* of stress.

The co-occurrence of depression with externalizing behavior problems has been found to be to an especially pernicious combination in youngsters. In particular, this pattern of comorbidity has been associated with higher levels of interpersonal impairment (Asarnow, 1988; Rudolph et al., 1994) and life stress (Jensen, Shervette, Xenakis, & Richters, 1993) than either type of disorder in isolation. Thus, we examined stress profiles in depressed youngsters with and without concurrent externalizing disorders. We anticipated that children with comorbid disorders generally would experience stress in multiple domains—including both interpersonal and noninterpersonal—as well as higher levels of stress when compared to children with depressive or externalizing disorders alone and to a clinic control group. Based on previous evidence for increased occurrence of dependent or self-generated, but not independent or fateful, life events in depressed adolescent women with comorbid disorders (Daley et al., 1997), we predicted that depression comorbidity would be particularly likely to be associated with differences in the generation of *dependent* stress.

The Role of Chronic Stressful Circumstances

A third conceptual focus of this study was to incorporate chronic stress into our life-stress model of child psychopathology. Although much of the research on depressed youngsters has focused on acute life events, or episodic stress, more recent studies have indicated that depression may be strongly associated with exposure to ongoing stressors (Compas, 1987; Daniels & Moos, 1990; Hops et al., 1990). Much of the past research on ongoing stressors in depressed children has focused on the occurrence of daily hassles (Compas et al., 1986; Robinson, Garber, & Hilsman, 1995) or microstressors (Hops et al., 1990), which generally reflect minor frustrations or annoyances. However, a few studies have examined the role of more severe ongoing difficulties or chronic environmental adversities, such as poor quality friendships (Goodyer, Wright, & Altham, 1989) and family dysfunction (Goodyer et al., 1997), in the onset and persistence of emotional disorders (see also Daniels & Moos, 1990). Because of the chaotic circumstances that often characterize the lives of clinic-referred children, we anticipated that the assessment of severe chronic stressful conditions would provide a more sensitive and accurate index of contextual influences than would the assessment of more minor daily hassles. Thus, we distinguished between episodic life events, which were defined as stressors with an acute onset and offset, and chronic stressful circumstances, which reflected longer term adversities such as disturbances in the family environment or continuous isolation from the peer group.

Methodological Issues

Finally, the present study addressed the relative lack of methodological sophistication that has characterized much of the existing life stress research in children. Research on youngsters has relied almost exclusively on life-event checklists, which typically yield either tallies of the total number of events or totals weighted by subjective or normative ratings of stress. Such measures are constrained by their reliance either on idiosyncratic perceptions of events, which may be confounded with depression, or on independent judgments of stress, which may overlook the context or meaning of events for an individual (Adrian & Hammen, 1993; Compas, 1987).

To address these limitations, adult depression researchers have advocated the use of in-

terviews and contextual threat coding methods, which yield information about the objective impact of stressors on individuals while maintaining a contextual approach that considers individual differences in the personal meaning and social context of events (Brown, Bifulco, & Harris, 1987; Brown & Harris, 1978; Hammen, 1991; Paykel, 1983). More recently, a few research groups also have applied such interview methods to younger age groups (Adrian & Hammen, 1993; Goodyer & Altham, 1991; Goodyer et al., 1997; see Goodyer, 1990, for review). For example, the Newcastle Child and Family Life Events and Difficulties Schedule was developed to assess both acute life events and chronic difficulties (Goodyer, Cooper, Vize, & Ashby, 1993; Goodyer, Kolvin, & Gatzanis, 1985). However, most of the studies using this approach have focused only on the role of independent life events and have depended on maternal reports of life stress (see Adrian & Hammen, 1993, for exception). Because contextually based approaches provide objective ratings of the negative impact of events and comprehensive information about the context of events, we expected that this methodology would be less susceptible to mood-related reporting biases and more sensitive to developmental differences in the significance of events (Goodyer et al., 1997). Indeed, the use of such life-event interviews has been found to increase the strength of the observed association between events and disorder (see Goodyer, 1990). Thus, we adapted these interviews and coding systems to construct a developmentally sensitive assessment of life stress.

Methodological confounds of stress checklists are exacerbated by the primary reliance in past research on single informant reports of symptoms and stress. In fact, studies examining cross-informant correlations have yielded weaker findings, leading investigators to conclude that the differing perspectives of parents and youngsters must be considered (Compas et al., 1989), particularly in adolescents (Monck & Dobbs, 1985). In the present study, we obtained both parent and child reports of psychiatric disorder and stress.

Finally, researchers have emphasized the importance of discriminating among different levels of depressive phenomena (i.e., mood, syndrome, and disorder) when testing conceptual models (Compas et al., 1994). Because life-stress researchers primarily have used symptom checklists rather than semistructured diagnostic interviews, the extent to which the same stress processes apply in clinically depressed youngsters remains unclear. To address this concern, this study used clinical diagnoses of depression and others forms of psychopathology.

Overview of the Present Research

The present investigation involved an analysis of life stress in an outpatient sample of preadolescents and adolescents. Semistructured interviews were administered to parents and youngsters to assess child psychiatric disorder, episodic stress, and chronic stressful circumstances. Three major questions were addressed: (a) Can a stress-generation model of depression be applied to children? (b) Does consideration of diagnostic specificity and comorbidity allow for the development of more refined life-stress models of child psychopathology? Specifically, does interpersonal stress play a particularly salient role in child and adolescent depression? and (c) What is the role of chronic stress in child psychopathology?

In light of the cross-sectional nature of this study, the direct impact of stress on depression or depression on stress was not determined. Rather, our goals were to examine whether a transactional life-stress model warrants further attention and to evaluate the utility of a more specific and complex approach to the assessment and analysis of life stress. Because our measurement of life-stress allowed us to differentiate between self-generated and independent life events, a longitudinal design was not necessary to assess transactional relations between children and their environments. For example, the presence of a significant association between dependent stress and depression would provide evidence that children who are vulnerable to depression tend to generate more stress in their lives, regardless of whether or not depression onset *preceded* the events.

We also examined whether the patterns of association between stress and psychopathology differed across sex and age. Whereas some research has revealed significant sex and age effects (Compas & Wagner, 1991; Ge et al., 1994; Larson & Ham, 1993; Rudolph & Hammen, 1999; Simmons et al., 1987), other investigators have found that stress–psychopathology linkages do not differ across sex, age, or pubertal status (Goodyer, Kolvin, & Gatzanis, 1986; McGee & Stanton, 1992). These contradictory data may result in part from the failure of previous studies to examine sex and age differences in the link between specific domains of life stress and specific types of psychopathology or to differentiate between independent and dependent events. As discussed earlier, we predicted that the link between interpersonal stress and depression may be stronger in girls than in boys. Furthermore, we predicted that depressed preadolescents may experience higher levels of independent stress than depressed adolescents, whereas depressed adolescents may generate higher levels of dependent stress than depressed preadolescents, reflecting the accumulation of self-generated stress and the consequences of depression over the course of development.

Method

Participants

Participants were recruited from a larger sample that was involved in an ongoing longitudinal investigation of children's mental health care (Weisz, 1997). Recruitment of the larger sample was conducted at several community-based outpatient child and adolescent clinics. Youngsters were referred to clinics for a range of emotional and behavioral problems (e.g., mood disorders, disruptive behavior disorders, adjustment difficulties). The sample for the present study (see also Rudolph & Hammen, 1999) included all eligible families who participated in the larger study during the targeted recruitment period and who provided independent consent to participate in this study. Of the original targeted sample, 15% of the families were either unable to be contacted (e.g., family had moved) or were ineligible for the study (e.g., child had significant developmental disability, child was no longer living at home). Of the eligible families that were contacted, 66% participated in the present study. Participants and nonparticipants did not significantly differ in age, sex, ethnicity, symptomatology on the Total Problem, Internalizing, and Externalizing scales of the Achenbach Child Behavior Checklist (CBCL), or diagnosis on the Diagnostic Interview Schedule for Children (DISC). Participants included 88 youngsters (31 female, 57 male) who ranged in age from 8.33 to 18.17 years ($M = 12.87$, $SD = 2.57$). Forty-six of the participants were preadolescents (8–12 years of age; 31 boys) and 42 were adolescents (13–18 years of age; 26 boys). The ethnic composition was 58.0% Caucasian, 19.3% African American, 17.0% Latino, 3.4% Asian American, and 2.3% other. All of the children had a female caregiver living in the home (90.9% biological mothers, 2.3% stepmothers, and 6.7% other) and 50% had a male caregiver living in the home (23.9% biological fathers, 21.6% stepfathers, and 4.5% other). The median family income level was between $15,000 and $30,000.

Procedures

Families were contacted by telephone and were provided with detailed information about the study. Those who chose to participate completed an in-person assessment session that involved extensive interviews and questionnaire completion by youngsters and their primary caregiver. Those measures relevant to the present study will be described below.

Measures

Schedule for Affective Disorders and Schizophrenia for School-Age Children—Epidemiologic Version (*K-SADS*). The K-SADS (Orvaschel, Puig–Antich, Chambers, Tabrizi, & Johnson, 1982), a semistructured diagnostic interview that assesses multiple domains of child psychopathology, was administered separately to youngsters and their parents. Based

Table 1. *Past year diagnoses in the four diagnostic groups*

	Depressive Disorders		Externalizing Disorders				Anxiety Disorders				
	MDD	DYS	ADHD	ODD	CD	ICD	SAD	OAD	PH	PD/A	SS
Depressed (n = 19)	12	9	0	0	0	0	4	2	7	0	0
Externalizing (n = 22)	0	0	13	9	2	2	0	0	0	0	0
Comorbid D/E (n = 15)	11	6	3	10	5	0	3	2	3	1	0
Clinic control (n = 18)	0	0	0	0	0	0	3	1	1	0	15

Note: D/E, depressed/externalizing; MDD, major depressive disorder; DYS, dysthymia; ADHD, attention deficit hyperactivity disorder; ODD, oppositional defiant disorder; CD, conduct disorder; ICD, impulse control disorder; SAD, separation anxiety disorder; OAD, overanxious disorder; PH, phobia (specific/social); PD/A, panic disorder with agoraphobia; SS, subsyndromal (i.e., subclinical levels of symptoms from various diagnostic categories). Row totals sum to greater than n per group due to the presence of comorbidity. ICDs reflected externalizing behavior problems (e.g., aggression, violence).

on both parent and child reports of symptoms over the past year, consensual diagnoses were assigned by a team of raters composed of licensed clinical psychologists and trained clinical psychology graduate students. Diagnoses were based on DSM criteria regarding the presence, severity, and frequency of symptoms as well as evidence of impairment.

Four diagnostic groups were formed: depressed, externalizing, comorbid depressed/externalizing, and clinic control. Inclusion and exclusion criteria for each group were as follows: (a) *Depressed* (n = 19), all children with a depressive disorder (i.e., major depression, dysthymia) and no externalizing disorder (i.e., attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder); (b) *Externalizing* (n = 22), all children with an externalizing disorder and no internalizing (depressive or anxiety) disorder; (c) *Comorbid Depressed/Externalizing* (n = 15), all children with concurrent depressive *and* externalizing disorders; and (d) *Clinic Control* (n = 18), all children with no current or past history of a depressive disorder or an externalizing disorder, most of whom were experiencing subsyndromal levels of symptoms (see Table 1 for a summary of the diagnoses in each group).[1] To assess the reliability of diagnostic assignments, audiotapes of 25 interviews were recoded by independent raters. Cohen's weighted kappas for past and current disorders, respectively, for the three diagnostic clusters used for group classification were .94 and .90 (*Depression*), .86 and .81 (*Anxiety*), and .88 and .74 (*Externalizing*).

Diagnostic groups did not differ in age, $F(3, 70) < 1$, *ns*, ethnicity (Caucasian vs. non-Caucasian), $\chi^2(3) = 4.92$, *ns*, or family composition (single- vs. two-parent families), $\chi^2(3) = 3.58$, *ns*. The groups did differ significantly in sex, $\chi^2(3) = 7.84$, $p < .05$, due to an underrepresentation of girls (14%) in the Externalizing group. The remaining groups did not differ in sex composition.

Continuous scores of past-year symptom severity also were generated by the interviewers by rating each diagnosis on a scale of 0 (*no symptoms*) to 4 (*diagnosis with severe impairment*). Composite indexes of depressive and externalizing psychopathology were calculated by summing 5-point ratings for relevant diagnoses (see above). Higher ratings therefore reflected a combination of more severe symptoms within particular diagnostic categories and/or the presence of symptoms from multiple diagnostic categories. Depressive and externalizing psychopathology ratings, respectively, were significantly correlated with self-reported depressive symptoms

1. Using these criteria, 14 youngsters did not fit into any of the four diagnostic categories. For example, those with comorbid externalizing and anxiety disorders but no depressive disorder or those with a history of depression or externalizing disorder but no disorder within the past year were omitted from the categorical analyses.

on the Children's Depression Inventory and with parent ratings on the Externalizing subscale of the Achenbach CBCL.

Child Episodic Life-Stress Interview. This semistructured interview (Rudolph & Hammen, 1999) is based on the contextual threat method developed for the assessment of life stress in adults (e.g., Brown & Harris, 1978; Paykel, 1983) and in youth (e.g., Adrian & Hammen, 1993; Goodyer et al., 1985). Parents and children were asked to report on children's experience of stressful life events during the past year. In addition to a general probe ("Has anything happened in the past year that has upset you [your child], or caused you [your child] trouble?"), inquiries were made about particular life domains (e.g., family, peer group, school, neighborhood, health, and legal troubles). Follow-up probes elicited details about each life event, including event timing and duration, and relevant information about the context in which the event had occurred (e.g., previous experience with the event, objective consequences). Information gathered from parent and child interviews was combined for the coding process; thus, events reported by both informants were included only once in calculating final stress scores.

Stress researchers have used three methods to quantify the amount of stress experienced: counts of the number of life events (e.g., Berden, Althaus, & Verhulst, 1990; Ge et al., 1994), determination of the presence or absence of at least one moderate to severe life event (e.g., Goodyer et al., 1986), and quantification of the total amount of negative impact or stress associated with the events (e.g., Adrian & Hammen, 1993; Daley et al., 1997; Hammen, Davila, Brown, Ellicott, & Gitlin, 1992). Because we were interested in the total exposure of children to stress, which may vary from event to event, we selected the third method for calculating life stress scores; accordingly, the term "stress" rather than "life events" is used to refer to the summary impact ratings.

Interviewers compiled a detailed written narrative summary that described the context and meaning of each event in order to determine the impact that would be associated with the event for a typical child in the same circumstances. This information was presented to an independent trained rating team of two to four members, who had no prior knowledge of the children's diagnostic status or their subjective reactions to the events. The team provided two consensual ratings for each event. First, they rated the objective stress or negative impact of each event on a scale of 1 (*no negative stress/impact*) to 5 (*severe negative stress/impact*). Event impact typically lasted from a few days to several weeks; more long-term, ongoing stress was captured in the Chronic Stress Interview (see below). Events with impact ratings of 1 were not included in subsequent analyses. Second, the team rated the dependence of each event, or the extent to which the child contributed to the event's occurrence, on a scale of 1 (*completely independent*) to 5 (*completely dependent*). For example, the death of a relative would be coded as completely independent, whereas getting arrested for car theft would be coded as completely dependent. Following previous protocol with this interview (e.g., Daley et al., 1997), events with dependence ratings of 3 or above were categorized as dependent for later analyses. To avoid the inclusion of symptoms themselves as events, events were included only if they were determined to have had a direct impact on the child through some objective consequences.

The team of raters also categorized each event according to its content. *Interpersonal* stressors included events that involved a significant interaction between the child and another person (e.g., the child has an argument with a parent) or events that directly affected the relationship between the child and another person (e.g., the child's best friend moves away). All other events were coded as *noninterpersonal* stressors (e.g., the child fails a test in school). Composite indexes were calculated that represented the overall amount of objective independent and dependent interpersonal stress and objective independent and dependent noninterpersonal stress. High reliability was achieved for the coding of objective stress/impact and dependence (intraclass correlation coefficients of .85 and .97, respec-

tively, *p*s < .001) and for the coding of event content (Cohen's κs > .80).

Chronic Stress Interview for Children. This semistructured interview was adapted from the Chronic Stress Interview for adults developed by Hammen and colleagues (1987; Daley et al., 1997). Behavioral probes were used to elicit information separately from parents and children about children's experience of chronic stress in the past year in several life domains, including ongoing problems in family and peer relationships and school-related stress. Within each domain, multiple probes were used to assess various types of stress. In the family domain, probes assessed problematic aspects of relationships such as lack of closeness, communication, and trust between parents and children, unavailability of parents, and ongoing conflict among family members (e.g., "How often do you argue/fight with your parents?"). In the peer domain, probes assessed problematic aspects of both friendships and more general peer relationships such as ongoing conflict with friends, isolation from the peer group, lack of participation in social activities, and chronic teasing by peers (e.g., "How often do other kids pick on you or tease you?"). In the school domain, probes assessed ongoing stressful conditions associated with both academic problems (e.g., "How often do you have problems with your school work?") and nonacademic problems (e.g., "How often do you get into trouble at school?"). Follow-up probes were used as needed to elicit sufficient detail for the ratings.

For each domain, a team assigned a rating on a 5-point scale for the degree of stress experienced during the past year. Each rating point was anchored by specific behavioral indicators in order to provide an objective rating that was independent of parent or child subjective judgments. Higher ratings reflected higher levels of stressful conditions and lower levels of positive conditions. *Interpersonal* (i.e., family- and peer-related stress) and *noninterpersonal* (i.e., school-related stress) chronic stress scores were formed by summing ratings from relevant domains. Ratings based on parent and child reports were highly correlated for interpersonal stressors, $r(86) = .62$, $p < .001$, and for noninterpersonal stressors, $r(86) = .89$, $p < .001$; thus, these ratings were averaged to create a single score. Intraclass correlation coefficients based on ratings of 20 participants by two independent teams demonstrated high reliability for interpersonal (average $r = .88$, $p < .001$) and noninterpersonal (average $r = .93$, $p < .001$) stress.

Results

Associations between life stress and psychopathology

The first set of analyses assessed the validity of a stress-generation model in youngsters and evaluated the specificity of this model to depression versus externalizing disorder. A series of partial correlations was conducted to examine the associations between episodic and chronic stress and severity of depressive and externalizing psychopathology, while controlling for the alternate symptom domain. Where specific predictions were made regarding the direction of effects, one-tailed significance levels are reported; two-tailed levels are reported where no predictions were made. In the total sample, as predicted, depression was found to be associated with dependent interpersonal episodic stress and interpersonal chronic stress. In contrast, as expected, externalizing disorder was found to be associated with dependent noninterpersonal episodic stress and noninterpersonal (school-related) chronic stress. Externalizing disorder also was marginally associated with interpersonal chronic stress. Neither form of disorder was associated with independent stress (see Table 2, columns 1 and 4).

To provide a more direct test of our specificity hypotheses, we conducted tests of dependent correlations (Steiger, 1980) to compare the strength of association among indexes of stress and psychopathology. One-tailed significance levels are reported as directional hypotheses were tested. Independent episodic stress was not included in these analyses due to the absence of significant associations with psychopathology. Our first specificity hypothesis was that depression would

Table 2. *Partial correlations between composite episodic and chronic stress indexes and psychopathology*

	Depression[a]			Externalizing Disorder[b]		
	Total (N = 88)	Girls (n = 31)	Boys (n = 57)	Total (N = 88)	Girls (n = 31)	Boys (n = 57)
Independent episodic stress						
Interpersonal	–.03	.08	–.10	–.06	–.10	–.02
Noninterpersonal	.11	–.08	.24†	.04	.09	–.03
Dependent episodic stress						
Interpersonal	.37***	.50***	.28*	.09	.55***	–.17
Noninterpersonal	.12	.25	.10	.31***	.24	.31*
Chronic stress						
Interpersonal	.37***	.40*	.33**	.19†	.42*	.11
Noninterpersonal (school-related)	.15	.28	.10	.57***	.37*	.68***

[a]Controls for externalizing disorder.
[b]Controls for depression.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .005$.

be correlated more strongly with interpersonal stress than with noninterpersonal stress. As predicted, tests revealed that depression was correlated significantly more strongly with dependent interpersonal episodic stress than with dependent noninterpersonal episodic stress, $t(84) = 1.88$, $p < .05$, and was correlated significantly more strongly with interpersonal chronic stress than with noninterpersonal chronic stress, $t(84) = 1.89$, $p < .05$. Our second specificity hypothesis was that interpersonal stress would be correlated more strongly with depression than with externalizing disorder. As predicted, tests revealed a significantly higher association between dependent interpersonal episodic stress and depression than externalizing disorder, $t(84) = 1.88$, $p < .05$. Contrary to predictions, a significant difference was not found for interpersonal chronic stress, $t(84) = 1.22$, *ns*.

Age and sex analyses

Next, we examined whether the pattern of partial correlations differed across age (preadolescent vs. adolescent) and sex. The effect sizes and significance levels were very similar in preadolescents and adolescents. However, results differed somewhat in girls and boys (see Table 2). With regard to the general pattern of correlations and significance, the first specificity hypothesis was supported in girls. That is, depression was significantly associated with interpersonal but not noninterpersonal stress. Tests of dependent correlations revealed that the differences between the correlations for interpersonal versus noninterpersonal stress were nonsignificant. Nevertheless, the correlation for dependent interpersonal episodic stress (.50) was twice as high as that for dependent noninterpersonal episodic stress (.25); this difference was marginally significant, $t(27) = 1.30$, $p < .10$. In boys, as predicted, depression was significantly associated with dependent interpersonal episodic stress and interpersonal chronic stress. However, depression also was marginally significantly associated with independent noninterpersonal episodic stress. Tests of dependent correlations revealed that depression was correlated significantly more strongly with independent noninterpersonal episodic stress than with independent interpersonal episodic stress, $t(56) = 1.69$, $p < .05$. Depression also was correlated marginally significantly more strongly with interpersonal chronic stress than with noninterpersonal chronic stress, $t(56) = 1.40$, $p < .10$.

Externalizing disorder in boys was associated specifically with dependent noninterpersonal episodic stress and noninterpersonal chronic stress but not with interpersonal stress. In contrast, externalizing disorder in girls was associated with dependent interpersonal episodic stress and with both interper-

sonal and noninterpersonal chronic stress. Tests of dependent correlations provided some support for the second specificity hypothesis in boys. Specifically, a significant difference was found for dependent interpersonal episodic stress, $t(56) = 2.36$, $p < .05$. This stress index was significantly *positively* correlated with depression, as predicted, but was (nonsignificantly) *negatively* correlated with externalizing disorder. Interpersonal stress was equally associated with depression and externalizing disorder in girls. Paralleling results in the total sample, independent stress was not significantly associated with depression or externalizing disorder in either girls or boys.

Role of comorbidity

The second set of analyses examined whether different levels and types of stress were associated with depression comorbidity. To ensure that any observed group differences were not merely due to more severe psychopathology in the comorbid depressed/externalizing group, we compared the depressed and comorbid groups on the severity of depression and we compared the externalizing and comorbid groups on the severity of externalizing disorder. No significant differences were found in past-year depression, $t(70) = 1.61$, *ns*, or in past-year externalizing disorder, $t(70) = .53$, *ns*.

The composite stress indexes (independent interpersonal and noninterpersonal episodic stress, dependent interpersonal and noninterpersonal episodic stress, and interpersonal and noninterpersonal chronic stress) were subjected to a multivariate analysis of variance (MANOVA) with diagnostic status (clinic control, depressed, externalizing, comorbid depressed/externalizing) as the between-subjects factor. A significant multivariate effect of diagnostic status was found, $F(18, 184) = 1.76$, $p < .05$. Because our sample size was reduced for the comorbidity analyses, we did not conduct separate analyses by age and sex. However, we did rerun the MANOVA controlling for age and sex, and the multivariate effect remained significant, $F(18, 179) = 1.98$, $p < .05$. We predicted that youngsters with comorbid depression and externalizing disorder would experience the highest levels of dependent episodic stress and chronic stress in both the interpersonal and noninterpersonal domains. Thus, the MANOVA was followed by a series of planned comparisons to compare the comorbid group to each other diagnostic group. Table 3 displays the means, standard deviations, and planned comparisons for the four groups.[2] It should be noted that these analyses used only the subsample of participants who qualified for one of the diagnostic groups ($n = 74$) and that children in each group may have had subsyndromal levels of other types of symptoms; thus, the pattern of results differs somewhat from those obtained in the first set of analyses.

As predicted, children with comorbid depression and externalizing disorder experienced significantly higher levels of dependent interpersonal episodic stress than did the clinic control, depressed, and externalizing groups, and experienced significantly higher levels of dependent noninterpersonal episodic stress than did the clinic control group. Planned comparisons also revealed significantly higher levels of interpersonal and noninterpersonal chronic stress in the comorbid group as compared to the three other diagnostic groups (see Table 3). As expected, diagnostic groups did not differ significantly in their level of independent interpersonal or noninterpersonal stress.[3]

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2. Note that in a normative community sample of preadolescents and adolescents in the same age range, a parallel methodology yielded a mean 1-year objective stress level of 9.2 ($SD = 4.4$; Adrian & Hammen, 1993), suggesting that our sample was at risk for experiencing high levels of stress. For example, our comorbid group experienced a total mean stress level of 17.8 ($SD = 8.0$), almost twice that of the normative community sample.
3. To allow for comparisons between these results and prior studies of depressed youngsters that have not considered comorbidity, we also conducted a series of *t* tests to examine differences between the nondepressed (clinic control and externalizing) versus depressed (depressed and comorbid) groups. Significant group differences ($ps < .05$) were found for dependent interpersonal stress and interpersonal chronic stress, with the depressed group showing higher levels of stress than the nondepressed group. A marginally significant

Table 3. *Mean scores on composite episodic and chronic stress indexes by diagnostic group*

	Clinic Control (n = 18) 1	Depressed (n = 19) 2	Externalizing (n = 22) 3	Comorbid (n = 15) 4	Planned Group Comparisons	p Value
Independent episodic stress						
Interpersonal	3.67	4.79	3.32	4.67	1 vs. 4	*ns*
	(4.26)	(4.75)	(3.56)	(3.63)	2 vs. 4	*ns*
					3 vs. 4	*ns*
Noninterpersonal	3.81	3.53	3.48	3.90	1 vs. 4	*ns*
	(2.86)	(3.11)	(2.51)	(3.56)	2 vs. 4	*ns*
					3 vs. 4	*ns*
Dependent episodic stress						
Interpersonal	1.56	3.13	2.82	5.73	1 vs. 4	p = .002
	(1.74)	(4.26)	(3.91)	(5.44)	2 vs. 4	p = .032
					3 vs. 4	p = .016
Noninterpersonal	1.19	2.74	2.84	3.50	1 vs. 4	p = .027
	(1.93)	(3.38)	(3.88)	(3.75)	2 vs. 4	*ns*
					3 vs. 4	*ns*
Chronic stress						
Interpersonal	5.11	5.83	5.69	6.88	1 vs. 4	p = .000
	(1.29)	(1.18)	(1.22)	(1.64)	2 vs. 4	p = .012
					3 vs. 4	p = .005
Noninterpersonal	5.19	5.20	6.66	7.87	1 vs. 4	p = .001
(school-related)	(2.33)	(1.97)	(2.17)	(2.28)	2 vs. 4	p = .001
					3 vs. 4	p = .052

Note: Standard deviations are shown in parentheses. The p values are based on one-tailed significance tests.

Age-related trends in independent versus dependent stress

Finally, we assessed whether depression was associated more with independent stress at earlier ages and with dependent stress at later ages. A mixed-model MANOVA was conducted for the two groups of depressed youngsters (depressed and comorbid), with age (preadolescent, adolescent) as a between-subjects factor and type of stress (independent, dependent) as a within-subjects factor. Supporting our hypothesis, a significant Age × Type of Stress interaction was found, $F(1, 32) = 3.12$, $p < .05$, one-tailed. As predicted, subsequent t tests revealed that depressed adolescents ($M = 9.29$, $SD = 6.81$) generated significantly more dependent stress than did depressed preadolescents ($M = 5.41$, $SD = 6.01$), $t(32) = 1.76$, $p < .05$, one-tailed. Although depressed preadolescents ($M = 9.09$, $SD = 5.31$) experienced more independent stress than did depressed adolescents ($M = 7.76$, $SD = 5.05$), the difference was nonsignificant.

group difference ($p < .10$) was found for independent interpersonal stress, with the depressed group showing higher levels of stress than the nondepressed group.

Discussion

The major goal of the present study was to examine a developmentally based conceptualization of the association between life stress and depression. Prior research often has taken an adevelopmental approach that fails to consider the processes underlying the formation of specific links between stress and psychopathology or the transactional exchanges between children and their social contexts. In contrast, the present research evaluated a life-stress model of depression that articulated the interpersonal processes involved in the development and perpetuation of depression and that accounted for children's contribution to their environments. The results were consistent with the proposed stress-generation model,

wherein depressed youngsters, particularly those with comorbid externalizing disorders, precipitated stressful events and circumstances in their lives.

Although both depression and externalizing psychopathology were associated with self-generated stress, distinct patterns of stress characterized the two forms of disorder. In particular, we found some support for two kinds of specificity: specificity of predictors (i.e., types of stress) and specificity of outcomes (i.e., types of psychopathology). In the total sample, after controlling for externalizing disorder, depression severity was associated with interpersonal episodic and chronic stress. In contrast, after controlling for depression, severity of externalizing disorder was associated with noninterpersonal episodic and chronic stress. Neither type of disorder was found to be associated with the level of independent stress experienced. Thus, a stress-generation model was supported in this clinic-referred sample of preadolescents and adolescents. Importantly, the nonsignificant results for independent stress and the specificity of the findings discount the possibility that any observed associations were merely due to a general tendency for individuals with more severe psychopathology to recall or report higher levels of stress.

As expected, the specificity results differed somewhat in girls and boys. Although our relatively small within-group sample sizes require that caution be taken in interpreting findings based on the tests of dependent correlations, the pattern of partial correlations and significance levels suggests a fairly consistent picture. With regard to the association between depression and interpersonal versus noninterpersonal stress, the pattern of findings was somewhat more consistent with predictions in girls than in boys. As predicted, particularly strong associations were found between interpersonal stress and depression in girls. In contrast, with regard to the association between interpersonal stress and depression versus externalizing disorder, the pattern of findings was somewhat more consistent with predictions in boys than in girls. Specifically, interpersonal stress was associated more strongly with depression than with externalizing disorder in boys, whereas interpersonal stress was associated as strongly with externalizing symptoms as with depression in girls. Because externalizing behaviors are considered less normative in girls, display of such behaviors may be more disruptive to their interpersonal relationships. This possibility warrants further study using a longitudinal design that can discern the direction of the association between externalizing disorder and interpersonal stress. Of note, this study is one of the first to document sex differences in stress–psychopathology relations using interview measures and objective stress ratings, suggesting that these differences are not merely an artifact of response biases.

Support also emerged for our hypothesis that depressed adolescents would generate significantly more dependent events than would depressed preadolescents. This finding is consistent with a developmental conceptualization of stress–psychopathology relations, wherein the consequences of depression or associated impairment accumulate over time, perhaps resulting in the continuity or recurrence of disorder. Other than this finding, however, the overall pattern of results did not differ markedly for preadolescents and adolescents. Conceptually, we might expect to find age-related differences in the association between stress and depression. For example, in light of the changes in the nature and importance of relationships during adolescence (see Laursen, 1996), this period might be characterized by particular sensitivity to interpersonal stress. Furthermore, age may interact with sex in determining stress–psychopathology linkages. For instance, adolescent girls may be particularly susceptible to depressive responses to stress (Ge et al., 1994), especially in the interpersonal domain (Simmons et al., 1987). Given the limitations of our sample size, we did not examine interactions between age and sex. Because most previous studies have relied on self-report measures of symptoms or stress and have not examined specific stress–psychopathology relations, additional research using an interview methodology in larger samples is necessary to test further for main and interaction effects of age and sex. Moreover, inclusion of direct indexes

of development, such as pubertal status, will be important for constructing more developmentally sensitive models.

Overall, youngsters with comorbid depression and externalizing disorder tended to exhibit the highest levels of dependent stress, suggesting that this combination of disorders may create a particular risk for stress generation. Specifically, depressed youngsters with versus without externalizing disorder were best discriminated from each other by their experience of dependent interpersonal episodic stress, interpersonal chronic stress, and noninterpersonal chronic stress. Taken together, our findings underscore the importance of considering comorbid conditions when studying profiles of life-stress in depressed youth. As predicted, the comorbid group tended to experience higher levels of *interpersonal* stress found to be associated with depression, as well as higher levels of *noninterpersonal* (chronic) stress found to be associated with externalizing disorder. Moreover, the level of stress experienced by the comorbid group within the interpersonal and noninterpersonal domains was higher than that experienced by youngsters with depressive and externalizing disorders alone. Comorbidity may therefore be associated with increased risk for the experience of both more diverse types of stress and more severe levels of stress. Thus, failure to differentiate pure and mixed forms of disorder clearly would confound conclusions about the differential associations between particular subtypes of life stress and psychopathology.

Although the observed pattern of results generally was consistent with our hypotheses, and episodic and chronic stress were moderately associated with psychopathology, some of the diagnostic group differences were fairly small and no group differences were found for independent stress. Several issues should be considered in interpreting these results. First, we had modest sample sizes within each diagnostic group, which decreased our power to detect smaller effects. Second, we were faced with the relatively difficult task of identifying differences among groups of youngsters all of whom were undoubtedly experiencing severe and multiple impairments in many life domains. In contrast, most previous studies of life stress in youngsters have included a normal comparison group or have focused on samples that ranged along a broad continuum of symptom severity.

This methodological disparity from previous studies may in part explain the lack of observed association in the present study between independent stress and psychopathology. It may be the case that independent stress plays a more potent role in differentiating children with some form of disorder from those without disorder, rather than in differentiating among specific subtypes of psychopathology. Interestingly, in the only other study to our knowledge that differentiated between independent and dependent events based on the contextual threat methodology in children (Adrian & Hammen, 1993), offspring of depressed mothers were best discriminated by their experience of dependent, rather than independent, life events. Likewise, older adolescent women with comorbid depression have been found to be best discriminated from other diagnostic groups by their experience of dependent, rather than independent, stress (Daley et al., 1997). Finally, using a life-event checklist, Williamson and colleagues (Williamson, Birmaher, Anderson, Al-Shabbout, & Ryan, 1995) found differences in the occurrence of dependent but not independent life events in depressed versus nondepressed adolescents. However, results from our analyses comparing depressed versus nondepressed groups (see Footnote 3) did reveal a small difference in independent stress in the interpersonal domain. Additional work is needed to examine whether certain critical independent interpersonal events, such as deaths or separation from significant others, may discriminate more powerfully among diagnosticgroups.

Beyond these methodological issues, the small magnitude of observed differences also may result from the relative parsimony of the model that we tested. We chose to elaborate on certain conceptual aspects of life-stress models, including the distinctions between independent versus dependent stress, interpersonal versus noninterpersonal stress, and episodic versus chronic stress. Moreover, we

attempted to overcome methodological limitations in prior life-stress research by assessing multiple domains of psychopathology in a clinical sample, by examining the utility of extensive life-stress interviews, and by applying detailed contextual threat rating methods. We view these efforts as useful first steps in expanding life-stress research. However, it is important to keep in mind that the development of disorder-specific models of psychopathology is likely to require the inclusion of combinations of predictors rather than just single dimensions (Cicchetti & Toth, 1998; Garber & Hollon, 1991). Thus, increasingly specific models of child depression presumably will require the consideration of "packages of influences" (Kazdin & Kagan, 1994) in the context of multidimensional models. For example, a growing body of evidence attests to the predictive power of diathesis–stress models of child depression, which focus on the role of vulnerability and protective factors as moderators of stress (e.g., Robinson et al., 1995). Yet, most studies of diathesis–stress models have relied on aggregate stress levels derived from life-event checklists. Therefore, it will be fruitful for future efforts to be directed toward testing more complex models while incorporating increasingly refined indexes of stress such as those explored in the present study.

Comprehensive models also will need to consider the match between particular domains of stress and domains of personal vulnerability (Blatt & Homann, 1992; Hammen, Ellicott, Gitlin, & Jamison, 1989; Hammen & Goodman–Brown, 1990; Spangler, Simons, Thase, & Monroe, 1996; Turner & Cole, 1994). That is, although we found evidence for the salience of interpersonal stress in child depression, there is likely to be some variability in individual vulnerability to particular subtypes of stressors; these individual differences may moderate the adverse effect of certain stressful life experiences. Moreover, to elucidate the multiple pathways to depression, models will need to account for the potential interpersonal consequences of noninterpersonal events, such as the negative impact of academic or behavioral problems on relationships with parents, peers, and teachers.

In addition to developing more elaborate models, another important research direction will be to study those children who do not fit into the expected groups (see Kazdin & Kagan, 1994). The large within-group variation in stress levels for the four diagnostic groups attests to the presence of children who may manifest distinctly different pathways to depression and other disorders. For instance, depressed children who experience low levels of stress may display vulnerability linked to alternative processes, such as physiological dysregulation or skill deficits.

It should be noted that these results were obtained in a clinic-referred sample. Due to low rates of service utilization (Offord et al., 1987), clinic samples may not be representative of children in the community with similar disorders (Goodman et al., 1997). For example, although community samples demonstrate high rates of depression comorbidity (see Angold & Costello, 1993; Angold et al., 1999; Fleming & Offord, 1990; Hammen & Rudolph, 1996, for reviews), comorbidity rates may sometimes be inflated in clinic samples (Caron & Rutter, 1991; Goodman et al., 1997). Thus, these findings need to be replicated in community samples of children diagnosed with clinical levels of disorder. Also, because of our 66% consent rate, we need to consider the possibility of selection biases in our sample. However, because our participants and nonparticipants did not differ in demographic characteristics or levels of psychopathology, it is likely that the participants in the study reflect the broader population of clinic-referred children.

Although the present findings regarding dependent stress are consistent with a stress-generation model, the interpretation of these results is constrained by the cross-sectional design, which does not provide information about the temporal sequencing of stress and psychopathology. Thus, this study does not provide a test of the causal pathway from depression to the generation of stress. Nevertheless, these findings can act as a starting point from which to generate hypotheses about how depressed youngsters may construct and contribute to the frequently stressful environments in which they live. Importantly, a

stress-generation model of depression would predict not only that depression precedes and causes stress. Rather, along with the disruptive influence of psychiatric disorder itself on children's lives, other stable characteristics of depression-prone individuals may lead them to create stressful circumstances. The next step in this line of research will therefore be to examine the relative contributions of depressive symptoms versus other child characteristics to the generation of stress.

Indeed, some exciting advances already have been made on this front. For example, Kendler and colleagues have found evidence for the influence of genetic liability on both exposure to low- versus high-risk environments, presumed to occur through self-selection, as well as relative sensitivity to the pathogenic influence of environmental stressors (Kendler, 1995; Kendler, Neale, Kessler, Heath, & Eaves, 1993). Moreover, consistent with the present model, genetic liability to major depression in females has been linked to increased exposure to particular types of life events, including interpersonal stress (Kendler & Karkowki–Shuman, 1997). In fact, research has suggested that genetic liability to life events may account in part for the increased rates of depression in adolescent girls (Silberg et al., 1999). However, this line of research has not yet explained the "mode of action" (Kendler et al., 1993, p. 795) through which genetic factors influence the experience of life events. Further delineation of the biological and psychological mechanisms underlying the stress-generation process will enhance our understanding of the context of depression across the life span, thereby contributing to the growing literature on contextualism and developmental psychopathology (Cicchetti & Aber, 1998).

Considering reciprocal influences between children and their environments may be particularly important when evaluating life-stress models in clinical samples such as the one studied here. Because many of the youngsters had a previous history of disorder prior to the index episode, studies with this type of sample typically identify predictors of the course of disorder and relapse, rather than initial onset of depression. At this point in children's lives, stress and disorder are likely to be intertwined in a self-perpetuating cycle. On the one hand, this complexity hinders our task of disentangling the direction of the causal arrows between stress and disorder. On the other hand, considering the impact of disorder as a contributor to future course and outcome may illuminate mechanisms underlying the cross-temporal continuity of disorders. Given the recurrent and chronic nature of depressive disorders, particularly those with an onset in childhood and adolescence, it will be essential to integrate child–environment transactions into emerging developmental psychopathology models of depression.

Identification of the potential harmful consequences of depression also may inform intervention efforts designed to prevent the perpetuation and exacerbation of childhood-onset disorders through adulthood. If depression and other forms of psychopathology yield additional impairment and interfere with the achievement of normative developmental milestones, interventions designed to reduce the duration of illness and to minimize the spread of dysfunction to multiple areas of children's lives may play a significant role in both the alleviation of current distress and the prevention of future disorder.

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