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3 Cognitive Vulnerability to Depression in Children and Adolescents

*A Developmental
Psychopathology Perspective*

John R. Z. Abela and Benjamin L. Hankin

Ever since their introduction in the late 1960s, cognitive theories of vulnerability to depression have generated a vast amount of empirical attention (Abramson et al., 2002; Clark & Beck, 1999; Nolen-Hoeksema & Corte, 2004; Zuroff, Santor, & Mongrain, 2004). Initial research testing these theories focused on examining either the cross-sectional association between vulnerability factors and depressive symptoms or the main effect of vulnerability factors on change in depressive symptoms over time. Critical reviews of the literature, however, argued that such early studies provided an inadequate examination of the cognitive theories as they failed to examine the theories' central hypothesis, that cognitively vulnerable individuals are more likely than other individuals to experience increases in depressive symptoms only in the face of negative events; in the absence of such events, cognitively vulnerable individuals are no more likely than others to exhibit depression (Abramson, Alloy, & Metalsky, 1988; Alloy, Hartlage, & Abramson, 1988). In response to such critiques, the field saw a major shift in methodologies used to test cognitive theories and prospective diathesis-stress designs became the gold standard.

During the 1980s and 1990s, as diathesis-stress studies began to rapidly accumulate in the literature, a striking trend began to emerge. More specifically, the vast majority of studies testing the cognitive theories were using adult samples, with relatively few examining the applicability of these theories to youth. Such a trend would be understandable if depression was a disorder that is rare in children and adolescents. Results from studies examining the prevalence of depression in youth, however, indicate that depressive disorder

ders are relatively common, with up to 9% of youth experiencing at least one major depressive episode by the age of 14 (Lewinsohn, Rohde, Seeley, & Fischer, 1993). Further, results from epidemiological studies indicate that adolescence is a critical period for understanding depression, as it is during this time that the majority of individuals who develop depression experience their first clinically significant episode and that the sex difference in depression rates emerges (Hankin et al., 1998). Thus, examining the applicability of cognitive vulnerability theories to youth at different developmental stages is essential in order to gain a deep understanding of the mechanisms and processes underlying the onset, maintenance, and recurrence of this disorder.

In recent years, the field has seen a rapid growth in prospective studies testing cognitive theories of vulnerability to depression in child and adolescent samples. For example, of the 48 prospective studies that we review in this chapter, 38 have been conducted within the past 6 years. This increased attention to examining these theories in youth is due, in part, to increased awareness of the high prevalence, chronic course, and debilitating nature of childhood and adolescent depression (Shwartz, Gladstone, & Kaslow, 1998). This is also due, in part, to the seminal work of pioneering developmental psychopathologists who have highlighted the importance of examining cognitive vulnerability theories within a developmental framework (Garber, 2000; Hammen, 1992). We begin by discussing the central tenets of cognitive theories of vulnerability to depression. We next present a comprehensive review of prospective research examining four of the predominant cognitive models of depression: (1) the hopelessness theory (Abramson, Metalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978), (2) Beck's (1967) cognitive theory, (3) response styles theory (Nolen-Hoeksema, 1991), and (4) theories of personality predispositions to depression (Beck, 1983; Blatt & Zuroff, 1992). In the remaining sections, we highlight several areas that should be priorities for research on cognitive vulnerability to depression in youth, including (1) new conceptual approaches to understanding the relationships between cognitive vulnerability factors, (2) developmental issues, and (3) methodological and statistical issues that may enhance tests of the cognitive theories.

COGNITIVE VULNERABILITY TO DEPRESSION: THEORY AND EVIDENCE

Cognitive theories of depression are primarily concerned with the relationship between human mental activity and the experience of depressive symptoms and episodes (Ingram, Miranda, & Segal, 1998). Cognition is thought to encompass the mental processes of perceiving, recognizing, conceiving, judging, and reasoning. According to cognitive theorists, these cognitive variables have significant causal implications for the onset, maintenance, and remission of depression.

Cognitive theories of depression define vulnerability as an internal and stable feature of an individual that predisposes him or her to develop depression following the occurrence of negative events (Ingram et al., 1998). It is important to emphasize that cognitive models are fundamentally diathesis-stress models in that they posit that depression is produced by the *interaction* between an individual's cognitive vulnerability and certain environmental conditions that serve to trigger this diathesis into operation (Ingram et al., 1998). Evidence suggests that under ordinary conditions, persons thought to be vulnerable to depression are indistinguishable from the general population. Only when confronted with certain stressors do differences between vulnerable and nonvulnerable individuals emerge (Ingram et al., 1998; Ingram & Luxton, 2005; Monroe & Simons, 1991). For individuals who possess cognitive vulnerability factors, the occurrence of a negative

event triggers a pattern of negatively biased, self-referent information processing that initiates a downward spiral into depression. Nonvulnerable individuals react with an appropriate level of distress and depressive affect to the event but do not spiral into depression.

Cognitive theories of vulnerability to depression are essentially titration models (Abramson, Alloy, & Metalsky, 1995, p. 118). In other words, such theories posit that cognitive vulnerability is best conceptualized along a continuum, with some individuals exhibiting higher levels of cognitive vulnerability than others. Similarly, negative events are best conceptualized along a continuum, with some negative events being more negative than others. According to such a perspective, the higher the level of cognitive vulnerability an individual possesses, the less stressful the negative event must be to trigger the onset of depressive symptoms/episodes. Conversely, even youth possessing average or low levels of cognitive vulnerability may be at risk for developing depression following the occurrence of extreme stressors.

Within a titration framework, depression is also viewed as existing along a continuum of severity, ranging from subclinical depressive mood reactions to enduring clinically significant depressive episodes (Abramson et al., 1988; Alloy et al., 1988; see Hankin, Fraley, Lahey, & Waldman, 2005, for evidence that depression among youth exists on a continuum). Severity of depression is hypothesized to vary as a function of (1) the severity of cognitive vulnerability factors, (2) the severity of negative events, and (3) the content (e.g., situation-specific versus generalized) of the thought processes that ensue following the occurrence of stressors. Thus, cognitive diatheses can serve as vulnerability factors to either subclinical depressive mood reactions or clinically significant depressive episodes, depending on the severity of stressors encountered and the generality of the depressogenic thought processes triggered by such stressors. As cognitive theories state that a less severe analogue to clinical depression exists when stressors and vulnerability factors are not extreme and depressogenic thought processes are event-specific, researchers have examined such theories from multiple perspectives, ranging from predicting depressive mood reactions following the occurrence of stressful events (e.g., Abela, 2002; Abela & Seligman, 2000) to predicting the development of clinically significant depressive episodes in high-risk populations (e.g., Alloy et al., 2006; Hammen, Adrian, & Hiroto, 1988).

Although a multitude of vulnerability factors have been posited by cognitive theorists, we focus our review on the following vulnerability factors, as they have been studied the most extensively across child, early adolescent, and adolescent populations: (1) depressogenic inferential styles about causes, consequences, and the self (Abramson et al., 1978, 1989), (2) dysfunctional attitudes (Beck, 1967), (3) the tendency to ruminate in response to depressed mood (Nolen-Hoeksema, 1991), and (4) personality predispositions to depression (Beck, 1983; Blatt & Zuroff, 1992). In addition, we focus our review on prospective studies, as they provide the most powerful tests of theories of cognitive vulnerability.

Hopelessness Theory

The hopelessness theory is a cognitive diathesis-stress theory that posits a series of contributory causes that interact with one another to culminate in the proximal sufficient cause of a specific subtype of depression: hopelessness depression (Abramson et al., 1989). The theory postulates three distinct depressogenic inferential styles that serve as distal contributory causes of hopelessness depression: (1) the tendency to attribute negative events to global and stable causes, (2) the tendency to perceive negative events as

having many disastrous consequences, and (3) the tendency to view the self as flawed or deficient following negative events. Each depressogenic inferential style predisposes individuals to the development of hopelessness depression by increasing the likelihood that they will make depressogenic inferences following negative events. Making such inferences increases the likelihood that hopelessness will develop. Hopelessness is defined as the expectation that negative events will occur and that positive events will not occur, coupled with the expectation that one can do nothing to change this. Once hopelessness develops, hopelessness depression is inevitable, as the hopelessness theory views hopelessness as the proximal sufficient cause of hopelessness depression.

Most of the research testing the diathesis–stress component of the hopelessness theory in children and adolescents has examined the question of whether youth who possess a depressogenic attributional style are more likely than other youth to experience increases in depressive symptoms following negative events. As illustrated in Table 3.1, several studies have provided full support for the attributional vulnerability hypothesis in youth (e.g., Abela, Parkinson, Stollow, & Starrs, in press; Dixon & Ahrens, 1992; Hankin, Abramson, & Siler, 2001; Hankin & Roesch, 2005; Hilsman & Garber, 1995; Joiner, 2000; Panak & Garber, 1992; Prinstein & Aikins, 2004; Southall & Roberts, 2002). Yet other studies have provided only partial support (Abela, 2001, 2002; Abela & Seligman, 2000; Brozina & Abela, 2006; Conley, Haines, Hilt, & Metalsky, 2001; Gibb & Alloy, 2006; Lewinsohn, Joiner, & Rohde, 2001; Nolen-Hoeksema, Girgus, & Seligman, 1986, 1992; Robinson, Garber, & Hilsman, 1995) or no support (Abela & Sarin, 2002; Bennett & Bates, 1995; Hammen et al., 1988; Spence, Sheffield, & Donovan, 2002) for this hypothesis. Fewer studies have examined the question of whether depressogenic inferential styles about consequences and the self serve as vulnerability factors to depression in youth. The results from those that have are mixed with studies providing full (Hankin & Roesch, 2005), partial (Abela, 2001, 2002; Abela & Seligman, 2000), or no support (Abela & Sarin, 2002) for this component of the hopelessness theory.

Beck's Cognitive Theory

Similar to hopelessness theory, Beck's cognitive theory is a diathesis–stress theory that posits a series of contributory causes that interact with one another to culminate in depression (Beck, 1967, 1983). Central to Beck's theory is the construct of schema. Beck defines schema as stored bodies of knowledge (i.e., mental representations of the self and prior experience) that are relatively enduring characteristics of a person's cognitive organization. When an individual is confronted with a situation, the schema most relevant to the situation is activated. Schema activation subsequently influences how the person perceives, encodes, and retrieves information regarding the situation.

Beck (1967, 1983) proposes that certain individuals possess depressogenic schema that confer vulnerability to depression. Beck hypothesizes that depressogenic schema are typically organized as sets of dysfunctional attitudes such as "I am nothing if a person I love doesn't like me" or "If I fail at my work then I am a failure as a person." Such schema are activated following the occurrence of negative events. Once activated, depressogenic schema trigger a pattern of negatively biased, self-referent information processing characterized by negative errors in thinking (e.g., negatively skewed interpretations of negative life events such as overgeneralization and catastrophizing). Negative errors in thinking increase the likelihood that an individual will develop the negative cognitive triad. Beck defines the negative cognitive triad as containing three distinct

TABLE 3.1. Summary of Prospective Studies Testing the Hopelessness Theory

Study	Sample type	Follow-up	Depression measure	Results	Sample size
Abela (2001)	3rd and 7th graders	1.5 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms in 7th graders but not 3rd graders. DIS-consequences \times stress predicted increases in depressive symptoms in 3rd and 7th graders. DIS-self \times stress predicted increases in depressive symptoms in 3rd and 7th grade girls, not boys.	382
Abela (2002)	12th graders	0.25–2 months	MAACL	DIS-causes, DIS-consequences, and DIS-self predicted enduring, but not immediate, depressive mood responses to a negative event.	136
Abela & McGirr (2007)	6- to 14-year-olds with an affectively ill parent	12 months, multiwave	CDI	Weakest link interacted with fluctuations in hassles to predict fluctuations in depressive symptoms.	140
Abela, McGirr, & Skitch (2007)	3rd and 7th graders	1.5 months, multiwave	CDI	Weakest link interacted with fluctuations in hassles to predict fluctuations in depressive symptoms.	382
Abela, Parkinson, Stolow, & Starrs (in press)	9th graders	1.5 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms.	319
Abela & Payne (2003)	3rd and 7th graders	1.5 months	CDI	Weakest link \times stress predicted increases in depressive symptoms in 3rd graders and 7th grade boys with low, but not high, self-esteem.	314
Abela & Sarin (2002)	7th graders	2.5 months	CDI	DIS-causes \times stress, DIS-consequences \times stress, DIS-Self \times Stress did not predict change in depressive symptoms. Weakest link \times stress predicted increases in depressive symptoms.	79
Abela & Seligman (2000)	12th graders	0.25–2 months	MAACL	DIS-causes, DIS-consequences, and DIS-self predicted immediate, but not enduring, depressive mood responses to a negative event.	77
Abela, Skitch, Adams, & Hankin (2006)	6- to 14-year-olds with an affectively ill parent	12 months, multiwave	CDI	Weakest link interacted with fluctuations in parental depressive symptoms to predict fluctuations in children's depressive symptoms.	140
Bennett & Bates (1995)	11- to 13-year-olds	6 months	CDI	DIS-causes \times stress did not predict change in depressive symptoms.	95

(continued)

TABLE 3.1. (continued)

Study	Sample type	Follow-up	Depression measure	Results	Sample size
Brozina & Abela (2006)	3rd to 6th graders	1.5 months	CDI	DIS-causes \times stress, DIS-consequences \times stress, and DIS-self \times stress predicted increases in depressive symptoms in children possessing low, but not high, initial levels of symptoms.	480
Conley et al. (2001)	5- to 10-year-olds	0.5-1 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms in 5- to 7-year-olds with low self-esteem, but not in 8- to 10-year-olds.	147
Dixon & Ahrens (1992)	9- to 12-year-olds at summer camp	1 month	CDI	DIS-causes \times stress predicted increases in depressive symptoms.	84
Gibb & Alloy (2006)	4th and 5th graders	6 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms in 5th but not 4th graders.	415
Hammen et al. (1988)	8- to 16-year-olds with either affectively ill, medically ill, or control parents	6 months	K-SADS	DIS-causes \times stress did not predict onset of depressive disorder.	79
Hankin & Roesch (2005)	6th to 10th graders	4 months; multiwave	CDI	DIS-causes \times stress, DIS-consequences \times stress, and DIS-self \times stress predicted trajectories of depressive symptoms.	320
Hankin, Abramson, & Siler (2001)	9th to 12th graders	1.25 months	BDI, HDSQ-R	DIS-causes \times stress predicted increases in depressive symptoms.	270
Hilsman & Garber (1995)	5th to 6th graders	0.2 months	CES-DC	DIS-causes \times stress predicted enduring but not immediate depressive symptoms in children possessing low, but not high, competence and perceptions of control.	439
Joiner (2000)	9- to 17-year-old mixed clinical sample	2 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms.	34
Lewinsohn, Joiner, & Rohde (2001)	9th to 12th graders	12 months	K-SADS	DIS-causes interacted with low stress to predict onset of depressive episode.	1,507
Nolen-Hoeksema et al. (1986)	3rd to 5th graders	12 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms in two out of four follow-up assessments.	168

(continued)

TABLE 3.1. (continued)

Study	Sample type	Follow-up	Depression measure	Results	Sample size
Nolen-Hoeksema et al. (1992)	3rd to 8th graders	60 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms in 5th to 8th graders but not 3rd or 4th graders.	336
Panak & Garber (1992)	3rd to 5th graders	12 months	CDI DAACL	DIS-causes \times stress predicted increases in depressive symptoms.	521
Prinstein & Aikins (2004)	15- to 17-year-olds	17 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms.	158
Robinson, Garber, & Hilsman (1995)	12-year-olds	4-5 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms among youth with low, not high, self-esteem.	371
Southall & Roberts (2002)	9th to 12th graders	3.5 months	CDI	DIS-causes \times stress predicted increases in depressive symptoms.	115
Spence, Sheffield, & Donovan (2002)	11- to 13-year-olds	12 months	BDI	DIS-causes \times stress did not predict depressive symptoms.	773

Note. CDI, Children's Depression Inventory; DIS-causes, depressogenic inferential style about causes (attributional style); DIS-consequences, depressogenic inferential style about consequences; DIS-self, depressogenic inferential style about the self; weakest link, an individual's most depressogenic inferential style; MAACL, Multiple Adjective Affect Checklist; K-SADS, Kiddie Schedule for Affective Disorders; BDI, Beck Depression Inventory; HDSQ-R, Hopelessness Depressive Symptoms Questionnaire, Revised; CES-DC, Center for Epidemiologic Studies Depression Scale for Children; DAACL, Depressive Adjective Checklist.

depressogenic cognitive patterns: negative views of the self (e.g., the belief that one is deficient, inadequate, or unworthy), negative views of the world (e.g., construing life experiences in terms of themes of defeat or disparagement), and negative views of the future (e.g., the expectation that one's difficulties will persist in the future and there is nothing one can do to change this). As Beck views the negative cognitive triad as a proximal, sufficient cause of depression, once an individual develops the negative cognitive triad, he or she will develop depressive symptoms.

To our knowledge, four prospective studies have examined the diathesis-stress component of Beck's cognitive theory in adolescent samples, and one has done so in a child sample (see Table 3.2). Although some of these studies have provided full support for the cognitive vulnerability hypothesis of Beck's theory (Hankin, Lakdawalla, Lee, Grace, & Roesch, 2004; Lewinsohn et al., 2001), others have provided only partial support (Abela & D'Alessandro, 2002; Abela & Skitch, 2007; Abela & Sullivan, 2003).

Response Styles Theory

The response styles theory posits that the way in which individuals respond to their symptoms of depression determines both the severity and duration of symptoms (Nolen-Hoeksema, 1991). Two such responses are proposed: rumination and distraction. Nolen-Hoeksema argues that individuals who engage in ruminative responses are likely to expe-

TABLE 3.2. Summary of Prospective Studies Testing Beck's Cognitive Theory

Study	Sample type	Follow-up	Depression measure	Results	Sample size
Abela & D'Alessandro (2002)	12th graders	0.25–2 months	MAACL	Dysfunctional attitudes × stress predicted immediate, but not enduring, depressive mood response to a negative event.	136
Abela & Skitch (2007)	6- to 14-year-olds with an affectively ill parent	12 months; multiwave	CDI	Dysfunctional attitudes interacted with fluctuations in hassles to predict fluctuations in depressive symptoms among youth with low, but not high, self-esteem.	140
Abela & Sullivan (2003)	7th graders	1.5 months	CDI	Dysfunctional attitudes × stress predicted increases in depressive symptoms among youth with high, but not low, social support and self-esteem.	184
Hankin, Lakdawalla, Lee, Grace, & Roesch (2004)	6th to 10th graders	4 months; multiwave	CDI	Dysfunctional attitudes × stress predicted trajectories of depressive symptoms.	320
Lewinsohn, Joiner, & Rhode (2001)	9th to 12th graders	12 months	K-SADS	Dysfunctional attitudes × stress predicted onset of depressive disorder episodes.	1,507

Note. MAACL, Multiple Adjective Affect Checklist; CDI, Children's Depression Inventory; K-SADS, Kiddie Schedule for Affective Disorders.

rience increased severity and duration of symptoms, whereas those who engage in distracting responses are likely to experience relief. The response styles theory was originally proposed to explain the finding that prevalence rates of depression are higher among women than men. Nolen-Hoeksema proposed that this difference could be accounted for, at least in part, by the differential response styles of the sexes. More specifically, she hypothesized that women are more likely to ruminate in response to depressed mood whereas men are more likely to distract.

To our knowledge, seven prospective studies have examined the vulnerability hypothesis of the response styles theory in youth (see Table 3.3). Results from these studies have consistently been supportive of the hypothesis that rumination is associated with greater severity of depressive symptoms over time (Abela, Aydin, & Auerbach, 2007; Abela, Brozina, & Haigh, 2002; Abela, Parkinson, et al., in press; Broderick & Korteland, 2004; Driscoll & Kistner, 2007; Hankin, Lakdawalla, et al., 2004; Schwartz & Koenig, 1996). Support for the hypothesis that girls exhibit greater rumination than boys, however, is mixed, with the majority of studies using child and early adolescent samples failing to obtain the hypothesized sex difference (Abela, Aydin, et al., 2007; Abela et al., 2002; Abela, Vanderbilt, & Rochon, 2004; Broderick & Korteland, 2004; for an exception, see Ziegert & Kistner, 2002) and studies using middle to late adolescent samples obtaining the hypothesized sex difference (Abela, Parkinson, et al., in press; Schwartz & Koenig, 1996). To date, no studies have obtained support for the hypothesis that boys are more likely than girls to engage in distraction in response to depressed mood.

TABLE 3.3. Summary of Prospective Studies Testing the Response Styles Theory

Study	Sample type	Follow-up	Depression measure	Results	<i>n</i>
Abela, Aydin, & Auerbach (2007)	6- to 14-year-olds with an affectively ill parent	1.5 months	CDI	Rumination predicted increases in depressive symptoms. Distraction predicted decreases in depressive symptoms. Rumination to distraction ratio scores predicted increases in depressive symptoms above and beyond rumination and distraction. No sex difference in rumination or distraction.	140
Abela, Brozina, & Haigh (2002)	3rd and 7th graders	1.5 months	CDI	Rumination predicted increases in depressive symptoms. Distraction not associated with change in depressive symptoms. No sex difference in rumination or distraction.	314
Abela, Parkinson, Stolow, & Starrs (in press)	9th graders	1.5 months	CDI	Rumination predicted increases in depressive symptoms. Girls exhibited higher levels of rumination than boys.	319
Broderick & Korteland (2004)	4th to 6th graders	36 months	CDI	Rumination associated with higher levels of depressive symptoms at follow-up, but did not control for initial depressive symptoms. No sex difference in rumination.	79
Driscoll & Kistner (2006)	2nd to 7th graders	8 months	CDI	Rumination × stress predicted increases in depressive symptoms. Distraction × stress predicted increases in depressive symptoms (i.e., low distraction × high stress). 6th- and 7th-grade girls exhibited higher levels of rumination than 6th- and 7th-grade boys during the initial, but not follow-up, assessment. No sex difference in rumination among 2nd to 5th graders at either assessment. No sex difference in distraction.	202
Hankin, Lakdawalla, Lee, Grace, & Roesch (2004)	6th to 10th graders	4 months; multiwave	CDI	Rumination predicted trajectories of depressive symptoms.	320
Schwartz & Koenig (1996)	9th to 12th graders	1.5 months	CDI	Rumination predicted increases in depressive symptoms. Distraction not associated with change in depressive symptoms. Girls exhibited higher levels of rumination than boys. No sex difference in distraction.	397

Note. CDI, Children's Depression Inventory.

Personality Predispositions to Depression

Researchers from diverse theoretical orientations have proposed that certain personality traits serve as vulnerability factors to depression (Beck, 1983; Blatt & Zuroff, 1992). Although differences in conceptualizations exist, each theory proposes a personality predisposition focused on interpersonal issues and another focused on achievement issues. Psychodynamic theorists label these personality predispositions as *dependency* and *self-criticism* (Blatt & Zuroff, 1992), whereas cognitive theorists label them as *sociotropy* and *autonomy* (Beck, 1983). Individuals high in dependency/sociotropy are concerned with interpersonal issues; they need the approval of others to maintain a sense of well-being. Dependent/sociotropic individuals are hypothesized to be at risk for developing depression when they perceive disruptions in their relationships with others, interpersonal loss, and/or social rejection. Individuals high in self-criticism/autonomy, however, are concerned with achievement issues; they need to meet their own and/or others' standards to maintain a sense of well-being. Self-critical individuals are hypothesized to be at risk for developing depression when they perceive that they are not meeting such standards. The specific vulnerability hypothesis posits that individuals who possess personality predispositions are at risk for developing depression only following the occurrence of negative events congruent with their personality vulnerabilities. More specifically, it is hypothesized that dependent/sociotropic individuals are at risk for developing depression following negative interpersonal events, whereas self-critical/autonomous individuals are at risk for developing depression following negative achievement events.

Support for the vulnerability hypothesis of theories of personality predispositions to depression in youth has been mixed (see Table 3.4). With respect to self-criticism, five studies have found self-criticism to confer vulnerability to depression in youth (Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003; Adams, Abela, Auerbach, & Skitch, 2007; Shahar & Priel, 2003; Shahar, Blatt, Zuroff, Kuperminc, & Leadbeater, 2004) and two have not (Little & Garber, 2000, 2004). With respect to dependency, four studies have found dependency to confer vulnerability to depression in youth (Adams et al., 2007; Little & Garber, 2000, 2004, 2005) and four have not (Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003; Shahar & Priel, 2003; Shahar et al., 2004). Among the studies that have examined the specific vulnerability hypothesis, specificity (Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003, seventh graders; Little & Garber, 2000, 2004), reverse specificity (Shahar & Priel, 2003), and nonspecificity (Abela & Taylor, 2003, third graders) have all been observed.

Empirical Status of Theories of Cognitive Vulnerability to Depression in Youth

There are several main points to emphasize based on our brief review of the literature. First, it is clear that the preponderance of evidence supports the hypothesis that cognitive vulnerability factors interact with negative events to predict increases in depressive symptoms in both children and adolescents—although the pattern of findings does not always conform exactly to what was originally proposed by the theories (e.g., reverse specificity for specific vulnerability hypothesis).

Second, the extant corpus of evidence supporting/contradicting theories of cognitive vulnerability to depression in child and adolescent samples parallels that found in adult samples (see Hankin & Abela, 2005, for a review and elaboration on this point). On bal-

TABLE 3.4. Summary of Prospective Studies Testing Theories of Personality Predispositions to Depression

Study	Sample type	Follow-up	Depression measure	Results	<i>n</i>
Abela, Sakellaropoulo, & Taxel (2007)	7th graders	1.5 months	CDI	Self-criticism interacted with negative achievement, but not interpersonal, events to predict increases in depressive symptoms. Dependency did not predict change in depressive symptoms.	79
Abela & Taylor (2003)	3rd and 7th graders	2.5 months	CDI	Self-criticism interacted with negative achievement, but not interpersonal, events to predict increases in depressive symptoms in 7th-grade boys, but not girls, with low, but not high, self-esteem. Self-criticism interacted with both negative achievement and negative interpersonal events to predict increases in depressive symptoms in 3rd-graders with low, but not high, self-esteem. Dependency did not predict change in depressive symptoms.	303
Adams et al. (2007)	7- to 14-year-olds with an affectively ill parent	2 months; multiwave experience sampling	CDI	Self-criticism interacted with fluctuations in hassles to predict fluctuations in depressive symptoms. Dependency interacted with fluctuations in hassles to predict fluctuations in depressive symptoms.	56
Hammen & Goodman-Brown (1990)	8- to 16-year-olds with either affectively ill, medically ill, or control parents	6 months	CDI	Children exhibited increases in depressive symptoms following the occurrence of negative events congruent with their personality predisposition (achievement or interpersonal). The authors did not test the specific vulnerability hypothesis separately in the achievement and interpersonal domains.	64
Little & Garber (2000)	5th to 6th graders	3 months	CDI	Connectedness interacted with negative interpersonal, but not achievement, events to predict increases in depressive symptoms in boys. Connectedness predicted increases in depressive symptoms regardless of negative interpersonal or achievement events in girls. Neediness predicted increases in depressive symptoms in both boys and girls regardless of negative interpersonal or achievement events Neither self-criticism nor individualistic achievement orientation predicted change in depressive symptoms	486

(continued)

TABLE 3.4. (continued)

Study	Sample type	Follow-up	Depression measure	Results	<i>n</i>
Little & Garber (2004)	8th graders	12 months	CDI	Neediness and connectedness interacted with negative peer, but not academic, events to predict increases in depressive symptoms in girls but not boys. Neither self-criticism nor individualistic achievement orientation predicted change in depressive symptoms.	129
Little & Garber (2005)	6th graders with an affectively ill parent	12 months	CDI CDI-PR CDRS-R	Neediness and connectedness predicted increases in depressive symptoms through the mediating role of dependent interpersonal negative events, but not dependent noninterpersonal negative events or independent negative events.	185
Shahar et al. (2004)	6th to 7th graders	12 months	BDI	Self-criticism predicted increases in depressive symptoms in girls, but not boys, regardless of negative events. Dependency did not predict change in depressive symptoms.	460
Shahar & Priel (2003)	9th graders	4 months	CES-DC	Self-criticism interacted with negative interpersonal, but not achievement, events to predict increases in depressive symptoms. Dependency predicted increases in depressive symptoms regardless of negative interpersonal or achievement events.	603

Note. CDI, Children's Depression Inventory; CDI-PR, Child Depression Inventory; CDRS-R, Children's Depression Rating Scale—Revised; BDI, Beck Depression Inventory; CES-DC, Center for Epidemiologic Studies Depression Scale for Children.

ance, there exist proportionally as many studies with adults, as there do with children and adolescents that support the cognitive theories of depression.

Third, the majority of studies testing theories of cognitive vulnerability to depression in youth have done so within the framework of the hopelessness theory, focusing particularly on the theory's attributional vulnerability hypothesis. Far fewer studies have investigated the vulnerability hypothesis of other cognitive theories. This stands in stark contrast to tests of theories of cognitive vulnerability to depression in adults wherein there is a far greater balance in research examining the various theories. As a result, there is still comparatively less knowledge about cognitive vulnerability to depression in youth than in adults, and most of this knowledge is based on attributional style as a vulnerability factor.

Fourth, the various independent tests of cognitive diathesis-stress theories in child, adolescent, and adult samples yield what appears, at least on the surface, to be a picture of mixed support, based on the use of traditional significance testing criteria (e.g., $p < 0.05$; Cohen 1994) as the foundation for determining whether a study supports or refutes cognitive theories. This "counting the significance stars" approach (Meehl, 1978), however, such as we have implicitly used in this chapter, may incorrectly lead one to conclude that there is evidence to refute cognitive theories (in regard to adults, as well as youth)

when overall the evidence supports them. Such an approach may also drive one to search for moderators to account for the “equivocal” evidence base when such a search is not needed. In contrast to counting how many studies have been supportive based on simple tests of significance, quantitative reviews, such as meta-analyses, can aggregate across the many individual studies, with varying samples sizes, methods, and designs, to provide a more accurate picture of the state of the field. We are aware of one such quantitative review (Lakdawalla & Hankin, 2007), and it provides relatively strong support for the hypothesis that cognitive vulnerability factors interact with negative events to predict increases in depressive symptoms in both children and adolescents.

Finally, there are likely meaningful developmental patterns in how cognitive vulnerability factors transact with negative events over time to influence the development of depression, yet it is not entirely clear how various developmental factors (e.g., biological, cognitive, and emotional development, changes in parental and peer relationships, etc.) affect this process despite some theorizing on the issue (e.g., Abela & Sarin, 2002; Cole & Turner, 1993; Gibb & Coles, 2005; Hankin & Abela, 2005; Hankin & Abramson, 2001; Ingram, 2001). A necessary, and helpful, start toward understanding how development influences both cognitive vulnerability factors and their interaction with negative events is derived from the fact that, based on the research conducted to date, the effect size for the interaction between cognitive vulnerability factors and negative life events is in the small range for preadolescent children and in the medium range for adolescents (Lakdawalla & Hankin, 2007). This change in effect size following the transition into adolescence could be due to multiple causes, including the strengthening of cognitive vulnerability factors, increases in the frequency and/or objective intensity of negative events, negative changes in interpersonal relationships that previously served as protective factors (i.e., parent-child relationship), preexisting cognitive vulnerability factors interacting synergistically with normative changes in cognitive development (i.e., increases in self-consciousness and egocentrism), and/or the use of measures of cognitive vulnerability that are not appropriate for use with younger children. At this point, the reason for this change is not entirely clear.

In sum, there is still a need for research examining theories of cognitive vulnerability to depression in children and adolescents. In the sections that follow, we highlight several areas that should be priorities for research examining the cognitive theories in youth, including (1) new conceptual approaches towards understanding the relationships between various cognitive vulnerability factors, (2) developmental issues, and (3) methodological and statistical issues that may enhance tests of the cognitive theories.

CONCEPTUALIZING THE RELATIONSHIPS BETWEEN THE VARIOUS COGNITIVE VULNERABILITY FACTORS

Despite the etiology of depression being widely acknowledged as multifactorial in nature (e.g., Gotlib & Hammen, 2002; Hankin & Abela, 2005; Ingram & Price, 2001), relatively little research has considered possible relationships between the many risk, vulnerability, and protective factors proposed *across* the various cognitive theories of depression. It is unlikely that each cognitive vulnerability theory is presenting a distinct etiological pathway leading to the development of depression that is unaffected by the various contributory causes of depression proposed by alternative theories. Consequently, the richest examination of such theories will ultimately involve the integration of the various distinct risk, vulnerability, and protective factors proposed by empirically supported theories.

To date, three approaches to conceptualizing the relationships between various cognitive vulnerability factors have been proposed: (1) the multiplicative approach, (2) the additive approach, and (3) the weakest link approach.

The Multiplicative Approach

Most research to date that has attempted to take an integrative approach has conceptualized the relationships between the multiple vulnerability factors being examined (i.e., usually two) using a *multiplicative approach*. Such an approach posits that the vulnerability factors will interact synergistically to potentiate the stress–depression relationship such that the greatest increases in depressive symptoms following increases in stress will be observed in individuals possessing both vulnerability factors. For example, high levels of self-esteem buffer youth who possess cognitive vulnerability factors such as depressogenic inferential styles (Abela & Payne, 2003; Conley et al., 2001; Robinson et al., 1995; Southall & Roberts, 2002), dysfunctional attitudes (Abela & Skitch, 2007), and self-criticism (Abela & Taylor, 2003) against experiencing increases in depressive symptoms following negative events.

Although a multiplicative approach has proven useful in examining the integration of any given *two* models of vulnerability to depression, such an approach becomes more cumbersome, both theoretically and methodologically, when attempting to integrate a wider range of models. As the pool of vulnerability factors increases, the precision of the hypotheses becomes so exact that only those possessing the complete “depressogenic profile” are hypothesized to show increases in depressive symptoms following the occurrence of stressors.

The Additive Approach

A second approach to conceptualizing the relationships between multiple vulnerability factors is an *additive approach*. Such an approach assumes that an individual’s degree of vulnerability to depression depends on the ultimate *balance* between his or her vulnerability, protective, and risk factors. Vulnerability factors exhibit a cumulative effect, with the presence of each additional vulnerability factor leading to a greater degree of vulnerability. Conversely, protective factors exhibit a cumulative effect, with the presence of each additional protective factor leading to a lesser degree of vulnerability. This approach assumes that the factors work independently of one another, as shown by the factor analytic evidence just reviewed. For example, the additive approach would predict that a person with a depressogenic attributional style, a high propensity to ruminate, and low self-esteem (three vulnerabilities) is more vulnerable to depression than a person with a depressogenic attributional style, a high propensity to ruminate, and average self-esteem (two vulnerabilities). Furthermore, because of the counterbalancing effects of protective factors, such an approach would predict that a person with a depressogenic attributional style, an average propensity to engage in rumination, and average self-esteem (one vulnerability) is as vulnerable to depression as an individual with a depressogenic attributional style, a high propensity to ruminate, and high self-esteem (two vulnerabilities + one protective factor).

Several studies examining the hopelessness theory of depression in adult samples have taken an additive approach to conceptualizing the relationships between depressogenic inferential styles about the self, consequences, and causes. In doing so, researchers have assumed that the more depressogenic inferential styles an individual possesses, the

more negative his or her overall cognitive style. Results from such studies have generally been supportive of the hopelessness theory (Alloy, Abramson, Hogan, Whitehouse, Rose, et al., 2000; Alloy et al., 2006; Hankin, Abramson, Miller, & Haeffel, 2004). At the same time, no study, to our knowledge, has demonstrated that additive composite scores predict increases in depressive symptoms following negative events *above and beyond* the three individual vulnerability–stress interactions featured in the hopelessness theory. Demonstration of such a unique effect is necessary to show that the sum of an individual's scores on measures of inferential styles provides information about his or her degree of vulnerability to depression above and beyond what would be known by looking at each of his or her inferential styles separately. Studies examining the vulnerability hypothesis of the hopelessness theory in youth using an additive approach have yielded less supportive findings than those obtained in adult studies, with additive composite scores not being a significant moderator of the association between increases in depressive symptoms following the occurrence of negative events (Abela & Payne, 2003; Abela & Sarin, 2002).

Recent work examining the vulnerability hypothesis of the response styles theory in youth has also begun to take an additive approach to conceptualizing the relationships between the various response styles proposed in the theory. More specifically, measures assessing ruminative and distracting response styles typically ask participants to rate the frequency with which they utilize various behaviors or coping strategies in response to depressed mood. Research with youth has found ruminative responses to be either not associated (Abela, Aydin, et al., 2007; Abela et al., 2002, seventh graders; Abela, Vanderbilt, & Rochon, 2004, seventh graders; Ziegert & Kistner, 2002) or positively associated (e.g., Abela et al., 2002, third graders; Abela, Vanderbilt, & Rochon, 2004, third graders) with distracting responses on such measures, suggesting that many youth may not exhibit a consistent response style but, rather, may utilize multiple responses to depression whose opposing effects counterbalance each other. Abela, Aydin, et al. (2007) proposed that when examining the response styles theory, researchers should utilize composite scores that take into account both the likelihood that a given individual will engage in ruminative responses to depressed mood (a vulnerability factor) and the likelihood that he or she will engage in distractive responses (a protective factor). Using a sample of 140 children, between the ages of 6 and 14, of affectively ill parents, Abela, Aydin, et al. (2007) reported that rumination scores, distraction scores, and additive composite scores were all significant predictors of change in depressive symptoms over time. At the same time, additive composite scores predicted change in depressive symptoms over time above and beyond both rumination and distraction scores.

The Weakest Link Approach

A third approach to conceptualizing the relationships between multiple vulnerability factors is a *weakest link approach* (Abela & Sarin, 2002). This approach posits that when multiple vulnerability factors predict depression through a *similar mediating pathway* (e.g., negative cognitive style, dysfunctional attitudes, and self-criticism/dependency each increase the likelihood an individual will engage in negative thinking following negative events and thus develop depression), then an individual's most depressogenic vulnerability is the best marker of his or her true propensity for developing depression. Thus, when considering similar vulnerabilities, this approach predicts that an individual is as vulnerable to depression as his or her most depressogenic vulnerability makes him or her.

The weakest link approach (Abela & Sarin, 2002) was originally developed within the framework of the hopelessness theory of depression. Within the framework of this theory, the weakest link hypothesis posits that an individual is as cognitively vulnerable to hopelessness depression as his or her most depressogenic inferential style makes him or her. Abela and Sarin argue that their hypothesis follows from the hopelessness theory's logic that depressogenic inferences about negative events, irrespective of whether they are about the self, consequences, or causes, increase the likelihood of developing hopelessness (and consequently hopelessness depression). In an initial test of this hypothesis in a sample of seventh-grade students, Abela and Sarin reported that the participants' "weakest links" interacted with subsequently occurring negative events to predict increases in depressive symptoms. In contrast, none of the three individual depressogenic inferential styles on their own interacted with negative events to predict such increases. Finally, the interaction between weakest link scores and negative events exhibited a unique effect above and beyond each of the three individual diathesis-stress interactions featured in the hopelessness theory. Similar findings have been reported in subsequent studies utilizing child and early adolescent samples (Abela & McGirr, 2007; Abela, McGirr, & Skitch, 2007; Abela & Payne, 2003; Abela, Skitch, Adams, & Hankin, 2006).

Abela and Sarin (2002) have noted that the weakest link hypothesis may have particularly important implications for research examining the vulnerability hypothesis of the hopelessness theory in youth. More specifically, research examining the hopelessness theory in adult samples has not found depressogenic inferential styles about causes, consequences, and the self to be empirically distinguishable (Abela, 2002; Abela & Seligman, 2000; Hankin, Carter, Lakdawalla, Abela, & Adams, 2007; Metalsky & Joiner, 1992), whereas research examining the vulnerability hypothesis of the hopelessness theory in children has (Abela, 2001; Abela & Sarin, 2002). Furthermore, studies using child and early adolescent samples have reported that a large proportion (e.g., > 20%) of youth in their samples would be classified as extremely pessimistic (1 *SD* above sample mean score) on one inferential style but extremely optimistic on at least one other (1 *SD* below sample mean score; Abela & Payne, 2003; Abela & Sarin, 2002). Given that a significant proportion of children exhibit a range in their thinking styles, a weakest link approach may be particularly warranted in order to provide an adequate test of the diathesis-stress component of the hopelessness theory in children.

It is possible that a weakest link approach can prove beneficial in examining the relationships between cognitive vulnerability factors on a broader level. In a preliminary study examining this possibility, Abela and Scheffler (2007) had children (ages 7-15) complete measures assessing depressive symptoms, four cognitive vulnerability factors (e.g., rumination, self-criticism, low self-esteem, and negative cognitive style), and four interpersonal vulnerability factors (e.g., low social support, negative attachment cognitions, dependency, and excessive reassurance seeking). The children were subsequently given handheld personal computers that were programmed to signal them to complete measures assessing depressive symptoms and negative events once a week, at a randomly selected time, for 6 weeks. With respect to cognitive vulnerability factors, a depressogenic weakest link was associated with increases in depressive symptoms following negative events. In contrast, additive composite scores were not associated with such increases. Interestingly, with respect to interpersonal vulnerability factors, both depressogenic weakest link and additive composite scores were associated with increases in depressive symptoms following negative events. Furthermore, both scores exhibited unique effects. Such a pattern of findings suggests that the best approach to take when integrating multiple vulnerability factors may vary according to the type of vulnerability

factor examined. In addition, such results indicate that it is possible that multiple types of integrative relationships are present for certain types of vulnerability factors.

DEVELOPMENTAL CONSIDERATIONS

The Emergence and Consolidation of Cognitive Vulnerability Factors

Cognitive vulnerability factors to depression, by definition and theory, are believed to reflect stable individual differences, certainly by adulthood. However, both the age at which such vulnerability factors emerge and the extent to which they represent trait-like risk processes in youth remain unknown. It is vital to answer these questions, because understanding when and how vulnerability factors emerge as stable risks to depression is (1) essential for a fuller theoretical understanding of the development of and continuity/change in vulnerability factors to depression and (2) can potentially advance knowledge about when to implement optimal, developmentally sensitive interventions for depression. Understanding how cognitive vulnerability factors to depression emerge and stabilize may also shed light on the pattern of depression rates observed in children, early adolescents, and adolescents, especially if different *processes* lead to depression at different developmental stages. More specifically, it is possible that the processes described by theories of cognitive vulnerability come into play only in later developmental stages, shortly before depression rates begin to increase. Alternatively, cognitive vulnerability factors may exist and operate earlier, yet remain relatively latent until the increase in stressors that occurs during the transition from early to middle adolescence causes them to be more chronically active. Presently, both hypotheses (and, of course, the combination of these two possibilities) are viable. The discussion that follows conveys what is known theoretically and empirically about developmental influences related to cognitive vulnerability to depression.

Early Research: Theory and Evidence

There has been great debate in the literature as to the developmental stage at which cognitive vulnerability factors emerge (Garber, 2000; Gibb & Coles, 2005; Hammen & Rudolph, 2003; Hankin & Abela, 2005). Several researchers (e.g., Cole & Turner, 1993) have hypothesized that cognitive vulnerability factors do not begin to moderate the relationship between stress and depression until the transition from middle childhood to early adolescence; these theorists connect the emergence of such vulnerability factors to the influence of increasing levels of experience and cognitive processing capacities. For example, from the perspective of Beck's (1967, 1983) cognitive theory, researchers have hypothesized that schema do not become consolidated until adolescence, or even early adulthood, after repeated learning experiences have reinforced them (Hammen & Zuppan, 1984; Young, 1999). From the perspective of the hopelessness theory (Abramson et al., 1989), researchers have hypothesized that a depressogenic attributional style emerges as a vulnerability factor only during the transition from childhood to adolescence, when children acquire the ability to engage in abstract reasoning and formal operational thought (Nolen-Hoeksema et al., 1992; Turner & Cole, 1994).

In explaining the mechanisms underlying such a developmental hypothesis, researchers have drawn from a wide variety of findings in the cognitive development literature—particularly those pertaining to middle childhood. For example, during middle childhood, children develop a more stable and less concrete sense of self (Rholes, Blackwell,

Jordan, & Walters, 1980). Their self-views become increasingly differentiated (Abela & Véronneau-McArdle, 2002) as they shift their focus from concrete, behavioral characteristics in early childhood, to trait-like characteristics in middle childhood, to more abstract psychological constructs during adolescence (Harter, 1986, 1990). During this developmental period, children also become less here-and-now oriented (Shirk, 1988) and more likely to integrate past experience into working knowledge in a manner that informs interpretations and predictions (Rholes et al., 1980). Although very young children have a rudimentary understanding of causality (e.g., Oakes, 1994), it is not until middle childhood that their use of stable personality traits to explain behavior increases dramatically (Corrigan, 1995). Finally, some researchers have suggested that young children do not have the cognitive capacity to develop hopelessness because they have difficulty conceptualizing the sequencing of events as well as the length of time between events (Kaslow, Adamson, & Collins, 2000). Consequently, such researchers have hypothesized that it is only in the transition from middle childhood to early adolescence when a future time orientation and the ability to assess probabilities emerge that hopelessness can develop (Kaslow et al., 2000). Yet, contrary to this hypothesis, Kazdin, French, Unis, Esveldt-Dawson, and Sherick (1983) found that hopelessness in younger children was associated with depressive symptoms, and this finding appears to contradict the hypothesis that a future orientation is necessary for hopelessness to operate. This example of a discrepancy between theory and evidence illustrates that more work is needed to address this and other related hypotheses seeking to integrate work in basic cognitive development with the emergence and consolidation of cognitive risk factors.

In addition, the developmental hypothesis that cognitive vulnerability emerges during the transition from middle childhood to early adolescence is largely based on early research examining the attributional vulnerability hypothesis of the hopelessness theory in youth. Results from three studies, in particular, provide the most compelling support for this hypothesis. In a 1-year longitudinal study of 8- to 11-year-old children, Nolen-Hoeksema et al. (1986) found that attributional style interacted with negative events to predict increases in depression in two out of four follow-up assessments. In a 5-year longitudinal study of third-grade schoolchildren, Nolen-Hoeksema et al. (1992) found that the interaction between a depressogenic attributional style and negative events predicted increases in depressive symptoms in early adolescence (sixth to eighth grades) but not in middle childhood (third to fifth grades). Finally, in a cross-sectional study of fourth-, sixth-, and eighth-grade schoolchildren, Turner and Cole (1994) found that a depressogenic attributional style interacted with negative events to predict higher levels of depressive symptoms in eighth-grade children but not in fourth- or sixth-grade children.

When interpreting the results of these three studies, it is important to note two issues. First, support for this development hypothesis is based on the practice of null hypothesis significance testing (e.g., a significant attributional style \times stress interaction found in two of four analyses; Nolen-Hoeksema et al., 1986), and as argued earlier, this practice may not be effective or contribute to a progressive and cumulative scientific knowledge base (cf. Meehl, 1978). Second, attributional style was assessed in these studies using the Children's Attributional Style Questionnaire (CASQ; Seligman et al., 1984), a measure that is limited by its poor internal reliability (alpha range = .4-.6; Hankin & Abramson, 2002; Thompson, Kaslow, Weiss, & Nolen-Hoeksema, 1998). Subsequent research examining a wider range of cognitive vulnerability factors (e.g., depressogenic inferential styles about the self and consequences, a ruminative response style, dysfunctional attitudes, and self-criticism) and using improved measures of cognitive vulnerability, including more developmentally sensitive measures of attributional style (Conley et

al., 2001), has yielded a pattern of findings that is contradictory to this developmental hypothesis. For example, as seen in Table 3.1, several studies support the cognitive vulnerability–stress hypothesis in third-grade schoolchildren and children between the ages of 6 and 14 (prior to the age when this effect should be observed, if Cole's developmental hypothesis were correct), whereas other studies failed to support the cognitive vulnerability–stress hypothesis in adolescence (after the age when the developmental hypothesis states that this interaction should be found).

Although the pattern of results obtained in research examining theories of cognitive vulnerability to depression in youth suggests that such theories may be equally applicable to children, early adolescents, and adolescents, it is likely that much change occurs with respect to cognitive vulnerability factors throughout childhood and adolescence. More specifically, it is likely that the accumulation of experience and increased cognitive processing abilities leads to both (1) greater stabilization and consolidation of specific cognitive vulnerability factors and (2) greater interrelatedness among different cognitive vulnerability factors.

Stabilization of Cognitive Vulnerabilities into Trait-Like Risk Factors

We have adapted and applied conceptual and empirical approaches from research on basic personality development in order to advance knowledge on how and when cognitive vulnerability factors emerge and stabilize (e.g., Caspi, Roberts, & Shiner, 2005; Fraley & Roberts, 2005), including examination of rank-order stability and mean-level changes in vulnerabilities over time. Different processes can explain how vulnerability factors to depression maintain rank-order, or test–retest, stability over time. As seen in Figure 3.1, these include (1) a trait-like model (top panel), (2) a contextual/autoregressive model (middle panel), and (3) a combined trait/contextual model (bottom panel). Trait models predict that the empirical test–retest correlations will be invariant (ignoring statistical fluctuations in measurement precision) as the length of the test–retest interval increases, because a stable psychological variable (i.e., a trait vulnerability) organizes the manifestation of depression vulnerability over time. In contrast, contextual models predict that the magnitude of the test–retest correlations for depression vulnerability will decrease monotonically as the size of the interval increases (i.e., an autoregressive simplex pattern; Kenny & Zautra, 2001), because there is no enduring trait vulnerability in the model contributing to stability over time.

In order to test these different organizing conceptual models rigorously, it is essential that multiple waves of data be used. The two time point study (e.g., Burns & Seligman, 1989, in adults; Voelz, Walker, Petit, Joiner, & Wagner, 2003, in youth) typically used to examine the stability of cognitive vulnerability factors is inadequate for doing so, as it is the pattern of test–retest correlations over time, not the strength of any given test–retest correlation, that indicates whether the vulnerability factor is organized in a trait, contextual, or combined manner (Fraley & Roberts, 2005). With multiwave data, structural equation modeling (SEM) can be used to examine the pattern of test–retest correlations over multiple follow-ups to determine whether a trait-like or autoregressive contextual model best explains the rank-order stability of data over time. Moreover, longitudinal analyses can evaluate whether mean levels of stability change significantly over time for participants.

On the basis of this personality framework, Hankin, Fraley, and Abela (2005) recently provided the first examination of the *processes underlying the stability of cognitive vulnerability*, in any age group, using data from a 35-day diary study with late ado-

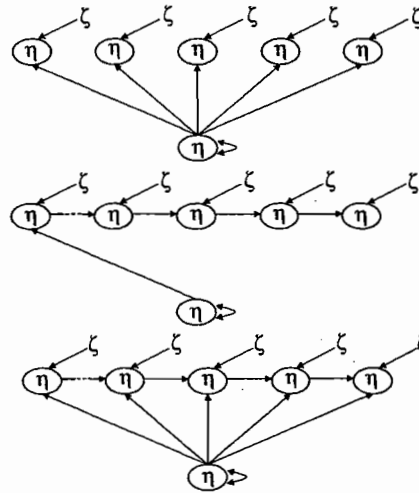


FIGURE 3.1. Processes explaining how vulnerability factors to depression maintain rank-order, or test-retest, stability over time: (1) a trait-like model (top panel), (2) a contextual/autoregressive model (middle panel), and (3) a combined trait/contextual model (bottom panel).

lescents ($n = 210$). Participants completed daily ratings of the inferences they made for the most negative event experienced every day for a month, based on the hopelessness theory. With respect to mean-level stability, cognitive vulnerability scores did not change on average over the 35 days. With respect to rank-order stability, cognitive vulnerability (negative cognitive style) was moderately stable over time (average test-retest $r = .38$, $SD = .08$, range = .56-.15). Using SEM, the pattern of this test-retest stability was best explained by a trait-like model. The contextual/autoregressive model provided a poor fit to the test-retest data, and the combined trait and contextual model fit as well as the trait model alone.

In addition, research with younger adolescents (grades 6-10; $n = 280$; Hankin, 2005) found that both depressogenic inferential styles and dysfunctional attitudes exhibited moderate mean-level stability over time, and this stability was explained best by a trait-like model. The adolescents' average levels of cognitive vulnerabilities (both depressogenic inferential styles and dysfunctional attitudes) were stable and did not significantly change over time. Moderate rank-order stability was observed: The mean correlation across the four waves of data for depressogenic inferential styles was .61 ($SD = .12$; range = .44-.74) and .29 ($SD = .15$; range = .08-.43) for dysfunctional attitudes. Using SEM, a trait model fit the cognitive vulnerability data over the four waves best for the sample as a whole, whereas an autoregressive model fit these data poorly. Finally, the youths' grades were examined to determine whether grade, as a rough index of developmental level, influenced the fit of these models, given the possibility that cognitive vulnerability factors may evolve into a more stable, trait-like vulnerability as a function of increasing grade. Consistent with this hypothesis, the trait model fit *both* the older (ninth and tenth graders) and younger (sixth to eighth graders) youth well. At the same time, the contextual model also fit *moderately* well in the younger, but not older, grades. These results provide initial evidence that cognitive vulnerability factors appear to have stabilized into a relatively stable, trait-like pattern, at least by sixth grade, although there is likely some continued change (i.e., greater stabilization) throughout early adolescence.

Developmental Changes in the Interrelation among Cognitive Vulnerability Factors

Another conceptual and analytic approach for understanding the emergence and stabilization of cognitive vulnerability factors is to examine the degree to which such factors interrelate with one another over time. Although various forms of cognitive vulnerability (e.g., depressogenic inferential styles, dysfunctional attitudes, rumination, self-criticism, etc.) may emerge and stabilize along a similar time course, their degree of interrelatedness may change as a function of development. For example, cognitive vulnerability factors may be relatively independent of one another early in development (Abela & Sarin, 2002). As development progresses, however, these vulnerability factors may become increasingly more interrelated and consolidated. Such a pattern of increasing interrelatedness would be consistent with research on temperament and personality development, in which many narrow, lower-order factors are observed early in development and the standard Big-5 factors are obtained in middle adolescence through adulthood (e.g., Caspi & Shiner, 2006; Rothbart & Bates, 2006).

The results from factor analytic studies suggest that cognitive vulnerability factors are more distinct in children than in adolescents and young adults (e.g., Adams, Abela, & Hankin, 2007; Hankin, Carter, et al., 2007; Joiner & Rudd, 1996). It appears that the various cognitive vulnerability factors may initially be relatively independent of one another but then become more interrelated during the transition from childhood to adolescence. As multiple vulnerability factors coalesce into a consolidated *set* of moderately intercorrelated cognitive vulnerabilities, youths' degree of vulnerability to depression may heighten. Interestingly, this contamination process may occur at about the same time that many researchers (Nolen-Hoeksema et al., 1992; Turner & Cole, 1994) have hypothesized that cognitive vulnerability to depression in youth first emerges.

Given that cognitive vulnerability factors become more interrelated with one another with age, different approaches to conceptualizing the relationship between multiple cognitive vulnerability factors may be optimal for youth at different developmental stages. When youths' cognitive vulnerability factors are still relatively distinct, knowledge of any particular factor may convey minimal information about the overall degree of vulnerability to depression. At this stage of development, a weakest link approach may be the most appropriate approach, as a child's most depressogenic vulnerability factor is likely to be the best indicator of his or her propensity to engage in depressogenic thinking following stressors (Abela & Sarin, 2002). As cognitive vulnerability factors become increasingly interrelated over time, however, knowledge of a child's level with respect to any given vulnerability factor provides information about his or her levels with respect to other vulnerability factors. At this point in development, an additive approach may become more appropriate than a weakest link approach, as the presence of multiple vulnerabilities may become an equally, if not more, important indicator of both the likelihood that he or she engages in depressogenic thought processes and the degree of negativity and generality of such processes.

Developmental Changes in Levels of Cognitive Vulnerability

An alternative way in which theories of cognitive vulnerability could shed light on the pattern of depression rates across development is if levels of the vulnerability and risk factors featured in such theories vary as a function of development. In other words, although similar processes may be related to the onset of depression in both children and adoles-

cents, differing levels of causal variables (e.g., vulnerability factors and stressors) may account for differing rates of depression in these age groups. For example, youth, especially girls, begin to encounter more stressors starting at about age 13 (Hankin & Abramson, 2001), so the increase in overall levels of stress, combined with cognitive vulnerabilities, could explain, at least in part, the rise in depression rates observed during adolescence. Few studies have prospectively followed groups of youth over time, monitoring changes in levels of cognitive vulnerability, so it is unclear whether cognitive vulnerability factors increase during the transition from childhood to early adolescence.

It is important to note that research examining changes in levels of cognitive vulnerability factors over time must consider not only the possibility that increases in levels of specific vulnerability factors contribute to increased depression rates, but also that a *lack of decreases* in levels of certain vulnerability factors may also contribute to increased depression rates. We have found a cross-sectional association between age and dependency (Abela & Taylor, 2003) and reassurance seeking (e.g., Abela, Hankin, et al., 2005; Abela, Zuroff, Ho, Adams, & Hankin, 2006), with younger children reporting higher levels of such variables than older children. It is possible that elevated levels of such cognitive-interpersonal variables are both normative and adaptive in younger children, and consequently elevated levels of such factors begin to confer vulnerability to depression only during the transition from childhood to early adolescence when they are expected to become developmentally atypical. As normative base rates of dependency and reassurance seeking decrease, the interpersonal behaviors associated with them may be viewed as developmentally atypical and, consequently, elicit more negative responses from others (e.g., parents, peers, etc.). Providing indirect support for such a hypothesis, although elevated levels of dependency have been found to serve as a vulnerability factor to depressive symptoms in both adolescents and adults (see Zuroff et al., 2004), dependency has not been consistently found to confer vulnerability to depression in children (e.g., Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003). Furthermore, although elevated levels of dependency have been found to be associated with impairment in social functioning in adolescents and adults (e.g., see Zuroff et al., 2004), elevated levels of dependency have been found to be positively associated with social functioning in children (Fichman, Koestner, & Zuroff, 1996).

The Developmental Origins of Cognitive Vulnerability

The developmental origins of cognitive vulnerabilities to depression have received far less attention than the diathesis–stress hypothesis of cognitive theories. Although a detailed discussion of this topic is beyond the scope of this chapter, we provide a brief overview of theories and topics that have generated the most theoretical debate and empirical research (for more detailed discussions, see Blatt & Homann, 1992; Garber & Flynn, 1998; Haines, Metalsky, Cardamone, & Joiner, 1999; see also special issues of *Cognitive Therapy and Research*, edited by Ingram, 2001, 2003a, 2003b).

Some researchers have hypothesized that experiencing a sustained episode of depression may lead to the development of cognitive vulnerability factors that persist even after the depressive episode itself remits. According to this perspective, a youth's initial depressive episode may be caused by factors other than cognitive vulnerability (e.g., a youth's coping abilities are overwhelmed following the experiencing of a severe stressor). However, as a result of experiencing such an episode, he or she becomes cognitively vulnerable to the recurrence of depression. Nolen-Hoeksema and colleagues (1992) outline several pathways through which the experience of a depressive episode may lead to the develop-

ment of cognitive vulnerability factors in youth. For example, depressed children often exhibit deficits in both academic performance and peer relations (Nolen-Hoeksema et al., 1986, 1992). Such deficits may lead these children to believe that they have low abilities and cannot control important outcomes in their lives. In addition, depression may facilitate access to negative memories and thoughts, owing to the priming effects of mood on cognition (Blaney, 1986; Bower, 1981). If such negative cognitions persist over an extended period of time, particularly when a child's self-view and styles of thinking are still developing, they may have a strong influence on the ultimate content of the belief systems and cognitive styles the child develops and maintains even after the episode of depression remits. Finally, research suggests that youth exhibiting depressive symptoms may generate stress (Hankin, Mermelstein, & Roesch, 2007; Rudolph & Hammen, 1999). Such youth may consequently act in ways that reinforce the development of cognitive vulnerability factors. For example, a depressed child deficient in social skills, who consequently encounters rejection, may learn to expect such rejection. Subsequent behavior, such as withdrawing from social activity, may lead to an increase in social rejection and consequently reinforce the negativity of developing cognitive styles (Ingram, 2001). Some studies have provided support for the hypothesized relationship between the experience of elevated levels of depressive symptoms and the subsequent development of cognitive vulnerability factors in youth (e.g., Gibb et al., 2006; Nolen-Hoeksema et al., 1986, 1992), whereas other longitudinal studies (e.g., Lewinsohn, Steinmetz, Larson, & Franklin, 1981; Rohde, Lewinsohn, & Seeley, 1994) have failed to obtain support for such a relationship.

Other researchers have hypothesized that certain types of negative life events may play a significant role in the development of cognitive vulnerability factors. More specifically, such researchers have proposed that (1) repeated exposure to negative events that occur in multiple and likely interacting domains (i.e., family conflict, divorce, poverty) and (2) chronic and/or major traumatic negative life events lead to the development of personal themes of derogation and unworthiness (Janoff-Bulman, 1992; Rose & Abramson, 1992). Such themes are posited, in turn, to become deeply ingrained in self-structures, consequently conferring vulnerability to subsequent episodes of depression. Consistent with this hypothesis, Garber and Flynn (1998) found that mothers' reports of the negative life events experienced by their children over the previous year predicted increases in depressogenic attributional style a year later. Further, in a prospective study of fifth and sixth graders, Rudolph, Kurlowsky, and Conley (2001) found that numerous facets of family disturbance (i.e., divorce, abandonment, parental death, or severe, recurrent, and inadequately resolved interparental conflict) and recent stress led to concurrent and subsequent deficits in perceptions of control and increased levels of helplessness.

Within the framework of the hopelessness theory of depression, Rose and Abramson (1992) have hypothesized that maltreatment, whether it is physical, emotional or sexual, is a specific type of negative life event that is particularly likely to lead to the development of depressogenic inferential styles. Following the experience of maltreatment events, youth attempt to understand the causes, meaning, and consequences of such events. In the case of an isolated experience of maltreatment, a child is not necessarily likely to make depressogenic inferences, as he or she is apt to interpret the event in a way that allows him or her to maintain hope ("My mom/dad was in a bad mood that day"). When such events become chronic (recurrent across time) and pervasive (recurrent across situations), however, a child is especially likely to begin to make depressogenic inferences about the maltreatment. The repetition of such depressogenic inferences following maltreatment consequently leads to the formation of a more general depressogenic inferential

style. Rose and Abramson (1992) suggest that when a child is emotionally maltreated, he or she may be particularly likely to develop depressogenic inferential styles, as the child is directly provided with the negative cognitions from the abuser that ultimately form his or her depressogenic inferential styles. Several studies have supported this hypothesis in adults (e.g., Gibb et al., 2001; Feiring, Taska, & Lewis 1998; Hankin, 2005; Rose, Abramson, Hodulik, Halberstadt, & Leff, 1994) and children (Gibb et al., 2006; Gibb & Abela, in press; Gibb & Alloy, 2006). Moreover, a history of childhood emotional, but not physical or sexual, maltreatment predicted depressive symptoms and episodes in adults, and this relationship was mediated by depressogenic inferential styles (Gibb et al., 2001; Hankin, 2005).

Some researchers have connected the development of cognitive vulnerability factors to maladaptive parenting practices. Within a cognitive-developmental framework, parenting consists of patterns of behaviors that convey information to the child, which may be internalized and subsequently contribute to the formation of beliefs about the self and the world (Bruce et al., 2006). Parenting that is characterized by high levels of warmth, acceptance, autonomy promotion, consistency, and positive reinforcement is likely to contribute to the development of positive views of the self and the world, whereas parenting that is characterized by high levels of criticism, rejection, control, and inconsistency is likely to contribute to the formation of negative views of the self and the world (Ainsworth, 1979; Beck, 1967; Blatt & Homann, 1992; Bowlby, 1969, 1980; Young, 1999). Several cross-sectional studies have provided support for the hypothesized link between maladaptive parenting practices and cognitive vulnerability factors. For example, within the framework of Beck's cognitive theory of depression, high levels of parental criticism, indifference, and control and low levels of parental acceptance and care have been found to be associated with higher levels of dysfunctional attitudes and cognitive distortions in youth (Alloy et al., 2001; Bruce et al., 2006; Garber & Flynn, 2001; Liu, 2003). Similarly, high levels of parental rejection, inconsistency, and restrictiveness and low levels of parental care, acceptance, and autonomy promotion have been found to be associated with a negative self-concept in youth (Bruce et al., 2006; Jaenicke et al., 1987; Liu, 2003). Finally, within the framework of the hopelessness theory of depression, high levels of parental criticism and control and low levels of parental care and acceptance have been found to be associated with a depressogenic attributional style in youth (Alloy et al., 2001; Bruce et al., 2006; Garber & Flynn, 2001; Jaenicke et al., 1987). In one of the few prospective studies to examine the hypothesized association between maladaptive parenting practices and cognitive vulnerability factors, Koestner, Zuroff, and Powers (1991) reported that maternal reports of parenting behaviors reflecting high rejection and restrictiveness when children were age 5 prospectively predicted elevated levels of self-criticism when youth were age 12—even after controlling for mothers' reports of their children's early temperament.

Other researchers have proposed that children may acquire cognitive vulnerability factors through modeling processes. It is thought that children learn to make causal inferences by observing their parents' inferential styles concerning the parents' own behavior. For example, Seligman et al. (1984) found that children's inferential style about the causes of negative events correlated with those of their mothers, but not their fathers. Yet others have failed to replicate these findings concerning the relationship between child and parental inferential styles (e.g., Garber & Flynn, 2001; Kaslow, Rehm, Pollack, & Siegel, 1988).

A variation on the modeling hypothesis is that rather than modeling their parents' inferential styles, children model the inferential feedback communicated to them about

events in their own lives. Most studies have tested this hypothesis by examining whether parents' typical inferential communications to their children are associated with their children's inferential styles. For example, Garber and Flynn (2001) reported that although mothers' and children's attributional styles were not significantly associated, mothers' and children's attributions regarding the same child-focused events were. Several other studies have obtained similarly strong support for this variant on the modeling hypothesis (e.g., Alloy et al., 2001; Dweck, Davidson, Nelson, & Enna, 1978; Fincham & Cain, 1986; Garber & Flynn, 2001; Turk & Bry, 1992; for an exception, see Gibb et al., 2006).

Finally, normative changes in cognitive development during the transition from middle childhood may play a role in either the development or the exacerbation of cognitive vulnerability factors. Elkind (1967, 1978) hypothesized that normative increases in self-consciousness and egocentrism during early adolescence contribute to increases in depression rates in this age group. Early adolescents maintain the false belief that others are as concerned about their thoughts and behaviors as they are. One consequence of adolescents' belief in an "imaginary audience" is heightened concern about what others think about them. Elkind has suggested that adolescents who are critical of themselves will anticipate a critical audience and, consequently, will be at risk for depression. Expanding on this hypothesis, Garber, Weiss, and Shanley (1993) posited that the relationship between adolescent cognitions (i.e., self-consciousness and egocentrism) and depressive symptoms is mediated by depressogenic cognitive styles. In line with this hypothesis, Garber and colleagues reported a significant relation between adolescent cognitions and both depressive symptoms and cognitive vulnerability factors (e.g., depressogenic attributional style, dysfunctional attitudes, negative automatic thoughts, helplessness expectancies, and negative outcome expectancies). Garber and colleagues hypothesized that self-consciousness and egocentrism may make adolescents particularly vulnerable to developing cognitive vulnerability factors, and consequently depression, if they experience stressors that impinge on their personal areas of specific concern (e.g., Hammen, 1990). That is, the interaction of normative adolescent cognitions with stressors that are common during this developmental stage (e.g., academic, social, and physical changes) may contribute to increased depression during adolescence through the mediating role of depressogenic cognitive styles.

METHODOLOGICAL CONSIDERATIONS IN THE STUDY OF COGNITIVE VULNERABILITY TO DEPRESSION IN YOUTH

In the past few years there has been a surge in literature examining possible methodological reasons for inconsistencies in the findings of studies examining theories of cognitive vulnerability to depression in children, adolescents, and adults (for reviews, see Gibb & Coles, 2005, and Hankin & Abela, 2005). We briefly discuss some of these reasons, as more methodologically rigorous research is likely to lead to greater consistency in findings in the examination of cognitive vulnerability to depression at all stages of development.

Nomothetic Versus Idiographic Approaches to Analysis

In recent years, researchers have increasingly turned to examining theories of cognitive vulnerability to depression in youth using multiwave longitudinal designs. The use of

such designs has opened many new avenues of inquiry, including the examination of the vulnerability–stress hypothesis of cognitive theories using idiographic as opposed to nomothetic approaches to analysis, as well as the examination of processes that explain how cognitive vulnerabilities maintain rank-order, or test–retest, stability over time.

In the typical study examining the diathesis–stress component of cognitive theories of vulnerability to depression (e.g., Abela & Sullivan, 2003; Hankin et al., 2001; Lewinsohn et al., 2001), vulnerability factors and depressive symptoms are assessed at Time 1. Depressive symptoms and the occurrence of negative events are assessed at Time 2 (e.g., 6 months later). Analyses are then conducted to examine whether the vulnerability factors interact with the occurrence of negative events to predict increases in depressive symptoms. Implicit within such a design is the reliance on a nomothetic (between-subject) approach to operationalizing high levels of stress. Within a nomothetic framework, an individual is considered to be experiencing a high level of stress when his or her level of stress is high in comparison to the sample's average level of stress. Thus, when testing the diathesis–stress component of cognitive theories utilizing a nomothetic approach, researchers are examining whether individuals who possess high levels of vulnerability are more likely than other individuals to experience increases in depressive symptoms when their levels of stress are higher than the sample's average level of stress. Although such an approach sounds plausible on the surface, it is likely to lead to inaccurate predictions at the level of individual study participants.

Consider the following example. Scores on a measure assessing the frequency of negative events over a 6-week interval range from 0 to 60, with a mean of 30 and a standard deviation of 10. Participant 1 and participant 2 both have high levels of cognitive vulnerability at Time 1. Participant 1 is coming out of a stressful period of her life. Although her score on the life event measure at Time 2 is 40, this score is considerably lower than the score she would have received had she completed the life events measure at Time 1. In fact, this score is the lowest she would have obtained over the past 12 months. Participant 2, however, has experienced several negative events in the past 6 weeks, causing him to receive a score of 25 on the life events measure. This score is considerably higher than the score he would have received had he completed the life events measure at Time 1. In fact, this score is the highest he would have obtained over the past 12 months.

Cognitive theories of vulnerability to depression would predict that participant 1 is not likely to exhibit increases in depressive symptoms during the course of the study, as the frequency of negative events in her life in the past 6 weeks has been low in comparison to the frequency of negative events she experienced in the 42 weeks prior to participating in the study. In contrast, cognitive theories of vulnerability to depression would predict that participant 2 is likely to exhibit increases in depressive symptoms during the course of the study, given that the frequency of negative events in his life in the past 6 weeks is high in comparison to the frequency with which he experienced negative events in the 42 weeks prior to participating in the study.

A nomothetic approach to operationalizing high levels of stress, however, would predict the exact opposite. More specifically, such an approach would predict that participant 1 is likely to show increases in depressive symptoms between Time 1 and Time 2 because her level of stress is higher than the sample's average level of stress. In contrast, such an approach would predict that participant 2 is not likely to experience increases in depressive symptoms between Time 1 and Time 2 as his level of stress is lower than that of the sample's average level of stress. Thus, when utilizing a nomothetic approach, important contextual information is likely to be lost, leading to inaccurate predictions at the level of individual participants.

Several researchers have recently proposed that the use of an idiographic (within-subject), as opposed to a nomothetic, approach to operationalizing high levels of stress is likely to lead to a more powerful examination of the diathesis–stress component of cognitive theories of vulnerability to depression (Abela, Aydin, & Auerbach, 2006; Abela & Skitch, 2007; Abela, Skitch, Adams, & Hankin, 2006; Abela, Webb, Ho, Wagner, & Adams, 2006; Abela, Zuroff, Ho, Adams, & Hankin, 2006). From an idiographic perspective, an individual is considered to be experiencing a high level of stress when he or she is experiencing a level of stress that is higher than his or her own average level of stress. In considering our previous example, an idiographic approach would predict that participant 1 is not likely to show increases in depressive symptoms between Time 1 and Time 2, because the frequency of negative events she experienced in the past 6 weeks is lower than in the preceding 42 weeks, whereas participant 2 is likely to show increases in depressive symptoms, as the frequency of negative events he experienced in the past 6 weeks is higher than in the preceding 42 weeks. Thus, an idiographic approach retains contextual information that is likely to lead to more accurate predictions at the level of individual participants.

The most powerful examination of cognitive vulnerability–stress theories requires the use of a multiwave longitudinal design in which stress and depression are assessed at multiple time points. The use of such a design allows researchers to examine the relationship between fluctuations in stress and fluctuations in depressive symptoms over time in individuals possessing varying levels of vulnerability. As can be seen in the upper panel of Figure 3.2, for an individual who possesses high vulnerability, cognitive theories would predict that stress and depressive symptoms should covary to a significant degree over time, with such individuals reporting higher levels of the depressive symptoms when they are experiencing high stress than when experiencing low stress. In contrast, as can be seen in the middle panel of Figure 3.2, for an individual who possesses low levels of vulnerability, cognitive theories would predict that although levels of stress are likely to fluctuate over time, levels of depressive symptoms should stay relatively low and stable. Thus, as illustrated in the bottom panel of Figure 3.2, when an idiographic approach is taken, vulnerability theories posit that stress and depressive symptoms will covary to a greater degree in individuals who possess high vulnerability than in individuals who possess low vulnerability. To date, studies have obtained consistent support for the diathesis–stress component of such theories in both children (Abela & McGirr, 2007; Abela, McGirr, et al., 2007; Abela & Skitch, 2007; Abela, Skitch, Adams, & Hankin, 2006; Abela, Zuroff, Ho, Adams, & Hankin, 2006) and adults (Abela, Aydin, et al., 2006; Abela, Webb, Ho, Wagner, & Adams, 2006) when using an idiographic, as opposed to a nomothetic, approach.

Research has only recently begun to examine the diathesis–stress component of cognitive vulnerability theories of depression using an idiographic approach to analysis. At the same time, nomothetic and idiographic approaches may be integrated. For example, Abela, Foa, and McWhinnie (2007) simultaneously examined the between- versus within-subject effects of both stress and hopelessness on depressive symptoms from a multiwave (nine waves of data collection) longitudinal study of 140 children (ages 6–14) of affectively ill parents over a 1-year interval. Results suggest that as individuals' average stress levels increase, the strength of the association between fluctuations in negative cognitions and fluctuations in depressive symptoms becomes stronger. This suggests a possible explanation for changes in the epidemiology of depression in adolescence. Mean levels of stress increase during the transitions from early to middle adolescence and from middle to late adolescence (Hankin & Abramson, 2001), so the association between neg-

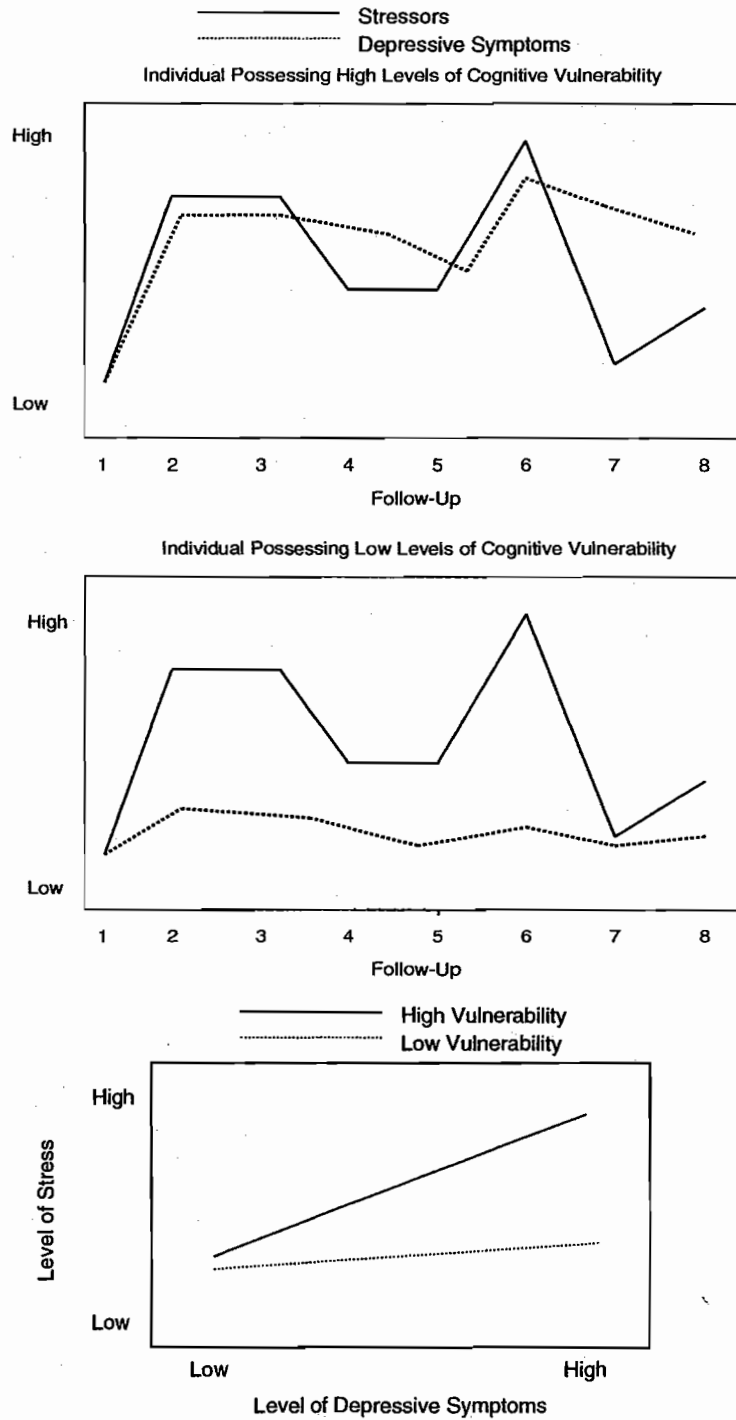


FIGURE 3.2. Hypothesized relationship between stress and depressive symptoms for individuals possessing high (top panel) and low (middle panel) levels of cognitive vulnerability. Hypothesized slope of the relationship between levels of stress and depressive symptoms for individuals possessing high and low levels of cognitive vulnerability (bottom panel).

ative cognitions and depressive outcomes may be potentiated, particularly for girls, who begin to experience higher average stress levels during the transition from early to middle adolescence than boys.

Priming of Cognitive Vulnerability Factors

Several cognitive theorists have argued that cognitive vulnerability factors are typically latent and must be activated by negative mood states and/or the occurrence of stressors in order to be assessed accurately (Beck, 1967; Persons & Miranda, 1992; Riskind & Rholes, 1984; Teasdale, 1983). Therefore, studies that do not activate or prime cognitive vulnerability factors before assessing them are likely to inadequately assess the true propensity of participants' depressogenic thinking, and as a result, may be less likely to yield results that are supportive of cognitive theories. Using various information-processing tasks and paradigms drawn from basic cognitive psychological research, a large body of research, using adult samples, has accumulated in recent years, providing support for this priming hypothesis (e.g., Gotlib et al., 2004; Gotlib, Krasnoperova, Yue, & Joormann, 2004; Joormann & Gotlib, 2007; Johnson, Joormann, & Gotlib, 2007; for review see Scher, Ingram, & Segal, 2005). In addition, prospective studies using adult samples have demonstrated that primed assessments of cognitive vulnerability factors, such as depressogenic inferential styles, predict increases in depressive symptoms following negative events above and beyond those predicted by unprimed assessments of such factors (Abela & Brozina, 2004; Abela, Brozina, & Seligman, 2004). Far fewer studies have examined the priming hypothesis in youth. Of those conducted, however, results have been consistently supportive (e.g., Joormann, Talbot, & Gotlib, 2007; Taylor & Ingram, 1999; Timbremont & Braet, 2004a, 2004b).

To our knowledge, no prospective studies examining theories of cognitive vulnerability to depression in youth have utilized priming procedures when assessing cognitive vulnerability factors. Thus, we cannot be certain that youths' true propensities for depressogenic thinking in such studies were accurately assessed. Future research is likely to benefit from incorporating priming techniques into its assessment procedures in order to increase the accuracy of its assessments of cognitive vulnerability factors.

Specific Vulnerability

Several theories of vulnerability to depression have proposed that certain individuals possess cognitive vulnerability only in specific content domains. Consequently, such individuals are vulnerable to developing depression only following the occurrence of domain-congruent stressors. For example, as outlined earlier, the specific vulnerability hypotheses of both Beck's (1983) and Blatt and Zuroff's (1992) theories of personality predispositions to depression posit that individuals possessing high levels of self-criticism/autonomy are vulnerable to depression following negative achievement, but not interpersonal, events, whereas individuals possessing high levels of dependency/sociotropy are vulnerable to depression following negative interpersonal, but not achievement, events. Similarly, the hopelessness theory posits that certain individuals possess depressogenic inferential styles in only the achievement or interpersonal domains and thus are vulnerable only to domain-congruent stressors (Abramson et al., 1995).

Research with adult samples has generally been supportive of the specific vulnerability hypotheses of both theories of personality predispositions to depression (for reviews, see Clark & Beck, 1999, and Zuroff et al., 2004) and the hopelessness theory (Abela,

2002; Metalsky, Halberstadt, & Abramson, 1987; for exception see Abela & Seligman, 2000). Research with child and adolescent populations, however, has yielded more mixed results, with some studies reporting specificity (Abela & Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003; Hammen & Goodman-Brown, 1990; Little & Garber, 2002, 2004), other studies reporting nonspecificity (Abela & Taylor, 2003, third graders), and others reporting reverse specificity (Shahar & Priel, 2003).

Although not enough research has yet accumulated to allow us to determine the mechanisms underlying such discrepant patterns of support, we outline possible explanations that may prove beneficial for future exploration. One possible explanation is that young children's self-concepts may not yet be differentiated enough for them to exhibit specific vulnerability (Abela & Taylor, 2003). In other words, in young children, interpersonal and achievement events may impinge on the same or similar self-aspects. As the complexity of children's self-concepts increases during middle childhood (e.g., Abela & Véronneau-McArdle, 2002), youth may increasingly perceive different domains of their lives (e.g., interpersonal and achievement events) as relevant to different self-aspects and consequently begin to exhibit specific vulnerability. Consistent with this explanation, research has demonstrated that whereas high levels of self-criticism predicts increases in depressive symptoms following both negative achievement and negative interpersonal events in third-grade schoolchildren, high levels of self-criticism predict increases in depressive symptoms following negative achievement, but not interpersonal, events in seventh-grade schoolchildren (Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003).

A second possible explanation is that dependency/sociotropy and self-criticism/autonomy are multidimensional constructs (Little & Garber, 2002), with some dimensions being maladaptive and others being adaptive. Among the currently used measures of these constructs, different measures may tap into different dimensions (e.g., adaptive versus maladaptive). This could account for, in part, the differences between studies obtaining greater support for theories of personality predispositions in youth in the achievement (Abela, Sakellaropoulo, & Taxel, 2007; Abela & Taylor, 2003; Shahar & Priel, 2003) versus the interpersonal domain (Little & Garber, 2002, 2004, 2005). Studies supporting theories of personality predispositions in the achievement, but not interpersonal, domain may have used measures tapping into the maladaptive components of self-criticism/autonomy, but the adaptive components of dependency/sociotropy, and vice versa for the interpersonal domain. It is important to note that different dimensions of these constructs may be adaptive or maladaptive at different developmental stages.

Finally, younger children may not perceive the world as divided into the same domains as do adults. This could mean that the specific vulnerability hypotheses derived from research with adult populations would not extend downward to youth. In line with this possibility, whereas research with adult samples has typically found the Dysfunctional Attitudes Scale to break down into belief clusters (e.g., factors) centering on themes of sociotropy and autonomy (Cane, Olinger, Gotlib, & Kuiper, 1986; Oliver & Baumgart, 1985; Rude & Burnham, 1993), research with youth has found the Children's Dysfunctional Attitudes Scale to break down into belief clusters centering on themes of self-critical perfectionism and personal standards perfectionism (McWhinnie, Abela, & Knauper, in press). Interestingly, items loading onto both factors contain both interpersonal and achievement themes. Similarly, in a study examining the factor structure of the Hassles Scale for Children in a sample of third- through sixth-grade schoolchildren, Abela, Brozina, and McWhinnie (2004) reported that hassles broke down into home-related hassles and school-related hassles, rather than achievement and interpersonal hassles. Thus, it is possible that both personality predispositions to depression themselves

and the negative events they interact with break down into different content domains in youth than in adults. Consequently, a more developmentally sensitive approach to examining specific vulnerability may be needed.

It is important to note that such constructs may also break down differently as a function of both developmental stage (e.g., childhood, early and late adolescence) and sex (e.g., see Abela & Taylor, 2003; Little & Garber, 2000; Shahar & Priel, 2003). In their elaborated cognitive vulnerability-transactional stress model of depression, Hankin and Abramson (2001) posit that there may be age- and development-related changes in the motivational strivings in individuals' primary domain of cognitive vulnerability. For example, preadolescent children's vulnerabilities may center on themes of family cohesion or academic success, whereas adolescent girls may focus on themes of physical appearance/body image, and middle age adults may think more about potential declines in physical health.

FUTURE DIRECTIONS

As the discussion in this chapter has illustrated, there is now fairly convincing evidence demonstrating that various cognitive vulnerability factors, interact with negative events to predict increases in depressive symptoms in both children and adolescents. Although more research is needed in order to understand the parameters of this cognitive vulnerability-stress process in explaining the onset, maintenance, remission, and recurrence of depression in youth, it seems safe to conclude that cognitive factors, particularly in interaction with negative events, play an important etiological role in the development of youth depression. In this final section, we focus on potentially important future directions for research aimed at advancing knowledge about the role of cognition in the ontogeny of depression in youth.

First, there is an urgent need for enhanced research investigating the developmental aspects of cognitive theories of vulnerability to depression. Such research may examine many issues. For example, as outlined earlier, research is needed examining both the emergence and consolidation of cognitive vulnerability factors. Prospective research is also needed examining the developmental processes that contribute to the formation of cognitive vulnerability factors. There must also be greater attention given to understanding whether distinct cognitive models are needed to understand the development of depression at different ages or whether a general cognitive theory, with slight modifications that take into account normative developmental changes, is applicable across the lifespan. Some have suggested fairly distinct models of depression for children versus adolescents and adults (e.g., Cole & Turner's [1993] mediation-moderation model). At the same time, some of the evidence reviewed in this chapter implies that potentially similar cognitive factors and processes are relevant for predicting depressive symptoms in children, adolescents, and adults. We believe that recent theoretical/conceptual, methodological, and statistical advances in the field, as described in this chapter, can better enable future research to evaluate this and related issues and to ascertain whether distinct cognitive models are needed to understand depression at different ages or whether a universal cognitive theory can successfully be applied to understanding the etiology of depression across development.

Second, there is a need to integrate cognitive vulnerability factors with other theoretically interesting and empirically supported vulnerability factors, especially neural, genetic, social/interpersonal, and emotional influences. Some exciting theoretical work integrating these previously disparate etiological factors has begun (e.g., Abramson

et al., 2002; Davidson, 2004; Gotlib, Joormann, Minor, & Cooney, 2006; Hankin & Abramson, 2001; Nelson, Leibenluft, McClure, & Pine, 2005), and some intriguing empirical research has recently been initiated. For example, a recent neuroimaging study combining information-processing tasks and affective stimuli found that depressed adults revealed reduced activity in the frontotemporal and limbic areas in response to happy words, as compared with controls, whereas for sad words they showed greater activation, as compared with controls in the inferior parietal region but less activity in superior temporal gyrus and cerebellum (Canli et al., 2004). There may be developmental differences in the extent to which various neural areas are engaged in the processing of affective stimuli, socially relevant events, and thus how these neural circuits may instantiate some cognitive vulnerability processes (e.g., memory or attention biases). Consistent with this possibility, adolescents have been found to exhibit greater neural activity in the anterior cingulate for remembered angry faces and greater activity in the right temporal pole when viewing remembered fearful faces, as compared with adults (Nelson et al., 2003; see also Pine et al., 2001). Other research has connected emotionality and temperament with cognitive vulnerabilities. In a 4-year longitudinal study, 3-year-old children's low levels of positive emotionality predicted various measures of cognitive vulnerability—specifically, negative attributional style and depressogenic schema—when they were at age 7 (Hayden, Klein, Durbin, & Olino, 2006). This finding supports Hankin and Abramson's (2001) model, in which it was hypothesized that temperament, especially negative and positive emotionality, distally predicts depression, in part, through stress generation processes (Hammen, 1991) and the development of cognitive vulnerability factors. Consistent with this hypothesis, results from a four-wave prospective study showed that adolescents with low positive emotionality and those with high negative emotionality experienced greater levels of depressive symptoms and encountered more negative events over time (Hankin, 2006). Moreover, the interaction of cognitive vulnerability factors with these negative events partially accounted for the association between negative emotionality and later depression (Hankin, 2006). Cognitive and genetic influences on depression can be integrated as well. Of particular interest, a recent behavioral genetic study reported evidence that a negative attributional style is also moderately heritable (Lau, Rijdsdijk, & Eley, 2006), as predicted by Hankin and Abramson (2001). Other research has used molecular genetic techniques to study functional genetic polymorphisms (e.g., the serotonin transporter, 5-HTT) and found that particular alleles (e.g., one or two copies of the short allele form of 5-HTT), interacting with negative events, predict depression (e.g., Caspi et al., 2003; Eley et al., 2004; see Moffitt, 2005, for a review). These exciting results raise the hypothesis that cognitive vulnerability factors may operate as an endophenotype (an intermediate trait; Gottesman & Gould, 2003) between latent genetic risk for depression and the behavioral phenotype of depressive disorder. Longitudinal research aimed at examining genetic risks in combination with cognitive vulnerability factors and negative events could test this hypothesis, as well as the potential for a genetic-cognitive integrated account of the development of depression. It would also be informative and exciting to conduct neuroimaging studies with youth who are genotyped while they are completing affective and information processing tasks aimed at assessing cognitive vulnerability factors (see Pezawas et al., 2005, for an example). Such research could begin to elucidate the interplay of genetic, neural, affective, and cognitive risks in the ontogeny of depression in children and adolescents. In sum, we look forward to the new advances in knowledge based on the potential for transdisciplinary research that seeks to coherently integrate cognitive vulnerability factors with other depression risk and vulnerability factors.

Third, cognitive vulnerability theories should continue to be applied in the quest to understand the "big facts" of depression, such as the dramatic rise in rates of depression starting in middle adolescence, the emergence of the sex difference in depression starting in early adolescence, and the strong continuity and recurrence of depression. For example, Hankin and Abramson's (2001) elaborated cognitive vulnerability-transactional stress theory of depression contains particular hypotheses, based in part on cognitive factors and processes, that can be tested to better understand the emergence of the sex difference and the overall rise in depression. In addition, other researchers have begun to examine how cognitive factors can help explain the course of depression: Negative life events have been found to predict first onsets of depression, whereas cognitive vulnerability factors, such as dysfunctional attitudes, are more strongly associated with recurrence of depression in adolescents (Lewinsohn, Allen, Seeley, & Gotlib, 1999).

Fourth, the greater part of research that has been conducted to date with youth examining cognitive theories of depression has assumed that negative events are independent of preexisting diatheses as well as independent of baseline depression levels. The diathesis-stress interaction has been overwhelmingly interpreted as a linear interaction: Negative events interact with the diathesis and the disorder follows. This underlying assumption of independence between the diathesis and environmental stressors has, for the most part, remained unquestioned, with researchers implicitly assuming that there is a random distribution of negative events across the population that determines who will develop depression and who will remain symptom free. Equally, baseline levels of depression have been consistently viewed as confounds of tests of the etiological chain and have therefore been tightly controlled for in selecting populations for study. Recent research, however, initially with adults (Hammen, 1991) and more recently with youth (Little & Garber, 2005; Rudolph et al., 2000; Shih, Abela, & Starrs, 2007), using semistructured clinical interviews aimed at differentiating between dependent and independent negative events, suggests that these assumptions may be incorrect and that stressful events are far from independent of these elements at least for some subsets of individuals. For example, using a sample of sixth-grade children of affectively ill parents, Little and Garber (2005) reported that neediness and connectedness predicted increases in depressive symptoms over a 1-year follow-up interval through the mediating role of dependent interpersonal negative events, but not dependent noninterpersonal negative events or independent negative events. Similarly, using a sample of 6- to 14-year-olds of affectively ill parents, Shih and colleagues reported that a depressogenic attributional style, self-criticism, and rumination all prospectively predicted the occurrence of dependent, but not independent, negative events over a 1-year follow-up interval even after controlling for initial levels of both parent and child depressive symptoms. Such findings suggest that youth who possess cognitive vulnerability factors may be in a double bind. In other words, not only do they possess cognitive factors that make them more likely than other youth to develop depressive symptoms following the occurrence of stressors, but they also play a role in creating the stressors that interact with their vulnerabilities. Future research is likely to benefit from examining cognitive diathesis-stress theories from a transactional perspective (see, e.g., Hankin & Abramson, 2001) in order to better understand both the cognitive and interpersonal processes underlying the onset of depression in youth. Such research is also likely to benefit from examining the impact of age and sex on such processes, given that preliminary research in this area has uncovered both age and sex differences (Rudolph et al., 2000; Rudolph & Hammen, 1999; Shih et al., 2007).

Finally, the comorbidity of depression with other emotional and behavioral problems and disorders is a well-known fact of psychopathology (e.g., Angold, Costello, &

Erkanli, 1999). Consequently, cognitive vulnerability factors need to be examined as depression-specific or disorder-general factors. Surprisingly little research has examined whether cognitive vulnerability factors, such as those discussed in this chapter, either alone or in interaction with negative events, specifically predict the development of depressive symptoms. Providing preliminary support for the specificity of such factors, Hankin and Abramson (2002) found that depressogenic inferential styles predicted depressive symptoms, but not externalizing problems, in a sample of adolescents. Similarly, in a four-wave longitudinal study of adolescents, Hankin, Lakdawalla, et al. (2004) found that both depressogenic inferential styles and dysfunctional attitudes interacted with negative events to predict trajectories of depressive symptoms more strongly than anxiety symptoms but not externalizing problems. Several other past studies have also found that the cognitive vulnerability factors discussed in this chapter are more specifically associated with depression than with other comorbid problems (e.g., Gladstone, Kaslow, Seeley, & Lewinsohn, 1997; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997; Robinson et al., 1995; Quiggle, Garber, Panak, & Dodge, 1992; Weiss, Susser, & Catron, 1998). Moreover, evidence has accumulated suggesting a sequential unfolding of comorbid patterns with depression such that anxiety typically precedes depression and earlier externalizing behaviors tend to predict later depressive symptoms (see Hankin & Abela, 2005, for a review). How do cognitive factors help to explain this typical developmental sequence of comorbidity between depression and other internalizing and externalizing problems? For example, the cognitive content specificity hypothesis suggests that depression is associated with negative cognitions involving loss and past failures, whereas anxiety is associated with cognitions involving harm and threat, and anger is associated with thoughts of unfairness. Do children with anxiety problems and thoughts centered on harm and threat become depressed adolescents with negative cognitions concerning loss and failure (cf. the helplessness-hopelessness model; Alloy, Kelly, Mineka, & Clements, 1990)? Solid theory and evidence seeking to understand the developmental unfolding of comorbidity patterns over time from a cognitive perspective are lacking, but they hold promise for enhancing etiological models and potentially identifying at-risk youth who may benefit from early prevention efforts.

In conclusion, the surge of interest in recent years in examining cognitive models of vulnerability to depression in children and adolescents has led to the accumulation of a substantial body of literature supporting the applicability of such theories to youth. At the same time, research has only just begun to examine many questions crucial to understanding the impact of development on the cognitive theories. For example, there remains much to be discovered about the processes through which cognitive vulnerability factors develop, how the latent structure and organization of cognitive vulnerability factors change as a function of development, and how cognitive diathesis-stress theories can provide insight into changes in the epidemiology of depression over the course of development—particularly with respect to the transition from early to late adolescence. The questions raised in this chapter and the theoretical and methodological innovations discussed are intended to serve as guides for theorists and researchers interested in expanding this important area of research. As literature examining these and other related questions accumulates, a stronger developmental psychopathology perspective on the etiology, maintenance, and recurrence of depression will emerge. Such an increased understanding from a developmental perspective will ultimately contribute to the most important goal of our field—the development of empirically supported treatment approaches for use with children and adolescents suffering from depression, as well as the creation of effective depression prevention programs for those at risk.

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