The origins of cognitive vulnerability in early childhood: Mechanisms linking early attachment to later depression

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A B S T R A C T

This paper examines the theory and research linking attachment relationships to cognitive vulnerability to depression and assesses evidence that early attachment experiences contribute to the development of these cognitive processes. Most research in this area has involved adult participants using self-report measures of both attachment and depressive vulnerabilities and thus cannot convincingly speak to the existence of such a developmental pathway. Several studies, however, have followed individuals from infancy and examined the emergence of self-esteem and responses to failure throughout childhood and adolescence. These studies suggest that early experiences in non-secure attachment relationships place an individual at-risk for developing a cognitive framework that increases their vulnerability to depression following stressful life events. The paper concludes with a discussion of how future research might best explore specific mechanisms through which distinct attachment relationships may lead to divergent developmental pathways sharing the common outcome of cognitive processes that place individuals at risk for depression.

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"Whether a child is happy and stable in his later period (later childhood), or unhappy and out of step with society or with his lessons, largely depends on one thing — the adequacy of his early nurture" (Ministry of Education, England, 1955, as cited in Bowlby, 1977, p. 2).

Depression is among the most common and debilitating psychological conditions afflicting modern society (Alloy, Abramson, Keyser, Gerstein, & Sylvia, 2008; Kessler, 2002). With a lifetime prevalence estimated at 5–12% for men, and 10–25% for women, depression has negative consequences for millions of individuals and their families (APA, DSM-IV-TR, 2000). Classified as a mood disorder, depression is characterized by affective, physical, and motivation symptoms including low mood, insomnia, and impaired concentration. The impact of this
disorder touches on many aspects of daily functioning, including interpersonal relationships, academic and vocational performance and physical health (DSM-IV-TR, 2000). Understanding how this debilitating condition first develops is prerequisite to effective early intervention that will be prophylactic rather than ameliorative.

Numerous theorists have suggested that life's earliest relationship experiences have important implications for depressive vulnerability (Beck, 1967, 1987; Bowlby, 1980; Ingram, 2001, 2003; Moran, Neufeld-Bailey, & DeOliviera, 2008). John Bowlby (1969, 1973, 1980) proposed that infants develop bonds, or attachments, through repeated interactions with primary caregivers over the first few years of life. These attachments – with deep evolutionary roots related to survival and reproductive fitness – have critical consequences for an individual's social and emotional functioning and associated developmental outcomes. In particular, Bowlby proposed that these experiences have implications for the later emergence of emotional disturbances such as depression: "The psychology and psychopathology of emotion is found in large part to be the psychology and psychopathology of affectional bonds" (Bowlby, 1977, p. 130).

Consistent with Bowlby's hypothesis, research over the past few decades utilizing self-report measures with adult participants has revealed associations between depressive symptoms in adults and self-reported attachment style (Dozier, Stovall-McClough, & Albus, 2008; Williams & Riskind, 2004). Such findings suggest that those with stable and supportive attachments to important others are much less likely to suffer from depression than those with less supportive relationships. There is also some limited evidence from longitudinal studies that attachment experiences in infancy are associated with symptoms of psychopathology later in life, including depression (Carlson, 1998; Duggal, Carlson, Sroufe, & Egeland, 2001). The most compelling support for Bowlby's proposal, however, would be the identification of a mechanism underlying the association between these early experiences and dysfunctional emotional functioning many years later. It has been suggested that this process involves maladaptive cognitive patterns arising from early social experiences that later lead to a vulnerability to the development of depression following adverse life events (Ingram, 2001, 2003; Moran, Neufeld-Bailey, & DeOliviera, 2008; Williams & Riskind, 2004). A model depicting the processes hypothesized to link attachment to depression is depicted in Fig. 1.

The current paper examines both theoretical and empirical support for this proposed model. A review of the associations between maladaptive cognitive styles and the onset and maintenance of depression (Fig. 1, Section 1) is followed by an analysis of research examining when these cognitive processes first emerge and stabilize (Fig. 1, Section 2). To understand the origins of these cognitive patterns, we then turn to an examination of attachment theory (Fig. 1, Section 3), and in particular, how early attachment experiences influence representations of the self, and subsequently, cognitive biases in the interpretation of negative events (Fig. 1, Section 4). A critique of the extant empirical literature examining these associations using adult participants and self-report measures is followed by a review of the few prospective longitudinal studies that provide evidence for a developmental link between early attachment experiences, representations of the self, and vulnerability to depression. The paper concludes with a summary of current evidence that cognitive processes emerging in early childhood serve as the mechanisms linking the first attachment relationship to later depression, and points to the additional research necessary to understand how early experiences in attachment relationships influence these processes.

1. Cognitive vulnerability to depression

Shortly after John Bowlby developed his theory of attachment, Aaron Beck began working on a hypothesis to account for individual variation in vulnerability to depression, i.e., a theory to account for the fact that some individuals become depressed following stressful life events, while others react less severely (Beck, 1967, 1987). Beck argued that depression should no more be thought of as an affective disorder than should scarlet fever be described as a disease of the skin, i.e., that external presentation should not be confused with the underlying pathology. Rather, he proposed that the affective, motivational and even physical symptoms of depression were primarily a product of the way an individual perceives himself, the world and the future — that depression is primarily a disorder of cognition. Beck observed that his patients' negative cognitive patterns most often preceded unpleasant affective experiences and that the content of these cognitive distortions closely paralleled that of the emotional response, suggesting a causal link. Beck's (1967) initial empirical observations were consistent with this inference: patients reported that maladaptive cognitions preceded congruent negative affective experiences.

Beck subsequently developed an influential cognitive theory of differential susceptibility to depression following stressful life events (Beck, 1967, 1987). He (Beck, 1967, 1987) proposed that an individual develops a self-concept which reflects their representations of the self, world and future based on the attitudes and opinions communicated to them by important others during childhood. Subsequent experiences are then interpreted in ways that are consistent with the content of this self-concept. For example, an individual with a negative view of the self, world and future will tend to focus selectively on disappointing aspects of a situation and, in the process, further consolidate their negative self-concept. Through repeated

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**Fig. 1.** Proposed pathway linking early attachment experiences to later depression.
experiences, such as this, the view of the self will solidify, becoming a more permanent cognitive structure, or a schema. While it may lay dormant, significant life stress can activate an individual’s negative self-schema, influencing information processing, and causing external stimuli to be screened, coded and evaluated within the framework of this schema (Dozois & Beck, 2008).

Aspects of Beck’s theory have been incorporated in a related but more specific account of vulnerability to depression: helplessness theory (Abramson, Seligman, & Teasdale, 1978; Nolen-Hoeksema, Girms, & Seligman, 1986). The roots of helplessness theory can be traced to studies observing cognitive, emotional and motivational responses of dogs to repeated unavoidable electric shocks. Over time, the dogs passively accepted the shocks, making no attempts to escape even when it was possible to do so (Schueller & Seligman, 2008). Replication via parallel studies with human participants produced nearly analogous results but not all participants responded to uncontrollable events with helplessness (see Abramson et al., 1978). On this basis, Abramson et al. (1978) formulated a theory that focused on the individual’s subjective interpretation of an aversive event as the key determinant of both helpless responses and subsequent depression. They argued that helplessness arises where an individual makes stable, internal and global attributions about such negative experiences (Alloy et al., 2008; Nolen-Hoeksema et al., 1986). Individuals who attribute negative events to such causes, in contrast, are likely to see positive experiences as products of external, unstable and specific causes. Together, these maladaptive explanations for success and failure create a helpless explanatory style that leads an individual to believe they have little control over future experiences, creating a vulnerability to the affective, physical and motivational symptoms that characterize depression. Various studies have found associations between these helpless explanatory styles and symptoms of depression in adults (Abramson et al., 1978; Schueller & Seligman, 2008) and in children and adolescents (Gladstone & Kaslow, 1995; LaGrange et al., 2008; Nolen-Hoeksema et al., 1986). Several longitudinal studies have more specifically identified the moderating role of stressful or negative life events in contributing to the onset of depression in individuals with negative explanatory styles (Cole et al., 2008; Conley, Haines, Hilt, & Metalsky, 2001; Dozois & Beck, 2008; Seligman & Nolen-Hoeksema, 1987) (see Fig. 1, Section 1). However, developmental origins and trajectories of these predisposing cognitive patterns remain to be identified (Hankin, 2008; Moran, Neufeld-Bailey, & DeOliviera, 2008).

2. When does cognitive vulnerability emerge and does it show continuity?

An important step in the search for the origins of these cognitive vulnerabilities to depression will be to identify the point in development when these negative patterns first emerge and stabilize. In the model shown in Fig. 1 this association is represented in Section 2, where helpless responses to failure predict vulnerability to the onset and maintenance of depression. Identifying the emergence of these processes has recently captured the interest of depression researchers who have brought a variety of perspectives to the issue.

The traditional position has been that cognitive vulnerabilities to depression become increasingly stable with age and show little predictive validity until late childhood and early adolescence (Cole et al., 2008; LaGrange et al., 2008). However, theoretical assertions put forth by both Bowlby and Beck suggest that experiences in relationships very early in life have a strong influence on the development of negative cognitive patterns (Beck, 1967; Bowlby, 1980) that then act as the mechanism linking early experience to vulnerability many years later. It may be that our failure to find evidence of cognitive vulnerability at earlier ages is a product of methodological limitations. For the most part, studies that have failed to find evidence of predisposing cognitive patterns in children have relied almost exclusively on self-reports of negative self-schema and helpless cognitions. The Children’s Attributional Style Interview (CASI; Conley et al., 2001), for example, has often been used to assess helpless explanatory style in early childhood (Cole et al., 2008; LaGrange et al., 2008). This measure involves asking children to provide a causal explanation of hypothetical scenarios and to indicate the degree to which the causes are internal, stable and global. While there is some evidence of the ability of the CASI to capture cognitive vulnerabilities to depression in young children (Conley et al., 2001), most research has suggested otherwise (Cole et al., 2008; LaGrange et al., 2008). Vitaro and Pelletier (1991) have demonstrated that a child’s representations of their behavior and observations of actual behavior differ substantially under the age of 9. Thus, the young child’s limited cognitive development appears to constrain their ability to provide accurate responses in such paradigms.

In response to this measurement challenge, several researchers have pursued more ecologically-valid, age-appropriate assessments of predisposing cognitive patterns in children as young as 4 years old (Kistner, Ziegert, Castro, & Robertson, 2001; Murray, Woolgar, Cooper, & Hipwell, 2001; Smiley & Dweck, 1994; Ziegert, Kistner, Castro, & Robertson, 2001). Smiley and Dweck (1994) examined 4 and 5 year-old children’s explanations for real failure on a series of insoluble puzzles. It was predicted that this behavioral task would be more likely to capture helpless attributions than would hypothetical scenarios. Following exposure to a series of soluble and insoluble puzzles, children were given the opportunity to choose one of these puzzles to work on again, and asked why they chose that puzzle. Children were assigned to a learning goal group if their choice reflected a desire to persist with a challenging/insoluble puzzle, and to a performance goal group if the choice indicated a wish to avoid the more challenging puzzles. Smiley and Dweck (1994) found that children in the latter group, particularly those who also expressed low confidence, were more likely to exhibit a helpless explanatory style following failure; they made more negative self-evaluations, expressed lower confidence in their future puzzle-solving abilities, and tended to believe that difficulty on these tasks was a result of their lack of ability. These findings clearly established that individual differences in helpless attributions are present in children as young as 4 years old, but beg questions regarding the stability and predictive validity of these processes — questions that have been addressed in more recent studies.

Ziegert et al. (2001) utilized the same puzzle task as Smiley and Dweck (1994) to examine the developmental trajectory and predictive validity of responses to failure in young children. They developed a composite score for helplessness based on children’s responses to several questions about their puzzle-solving abilities, including: why they believed they failed the tasks, whether they thought they could solve the tasks given more time, and how they expected to perform on similar tasks in the future. Helpless explanatory styles assessed in this manner showed moderate stability between ages 5 and 6 ($r = .41$), a correlation comparable to the one-year stability estimates typically reported using self-reports with older children (Cole et al., 2008; LaGrange et al., 2008; Nolen-Hoeksema et al., 1986). The kindergarten-age helpless explanatory styles of these same children were found to significantly predict lack of persistence ($r = .27$), low expectations for future success ($r = .21$) and teacher ratings of helplessness ($r = .22$) at age 10, when the stability of cognitive vulnerabilities to depression has been more clearly established (Ingram, 2001; Nolen-Hoeksema et al., 1986; Ziegert et al., 2001). In a related study, Kistner et al. (2001) demonstrated that helpless explanatory styles in kindergarten predicted negative self-worth ($r = .19$), self-reported symptoms of depression ($r = .19$) and teacher-reported symptoms of depression ($r = .25$) at 10 years of age. These associations are especially impressive given that they link diverse behavior over a 5-year span of development in childhood.
Other tasks have also been utilized to assess cognitive vulnerabilities in early childhood (Murray et al., 2001). Murray et al. used a competitive card game to measure self-schemas and negative attributions in 5-year-old children of depressed mothers, a group that has previously been identified as high-risk for developing depression (Goodman & Tully, 2008; Pilowsky et al., 2006; Riley et al., 2009). They found that children exposed to maternal depression were significantly more likely to express negative thoughts about themselves and the outcome of the card game when possessing a losing hand than were children who had not been so exposed (24.6% vs. 0% respectively).

Thus, contrary to previous assertions, there is growing evidence that vulnerabilities predisposing individuals to depression can be seen in children as young as 4 or 5 years old as distinct, enduring cognitive patterns. While these processes may become further consolidated in adolescence and adulthood, we now know that early cognitive vulnerabilities are moderately stable and relate meaningfully to functioning at a substantially older age. These important findings beg the question, however, of the still unspecified early developmental origins of this vulnerability.

Beck (1967) viewed an individual’s earliest experiences with important others, including parents, siblings and friends, as critical to the development of self-schemas. More specifically, he argued that the judgments of them by important others with whom they identify would have critical implications for the self-concept. This theoretical model aligns closely with that of Bowlby (1958) who, indeed, noted the connection: “Both formulations postulate that depressive-prone individuals possess cognitive schemas having certain unusual but characteristic features which result in their construing events in the idiosyncratic ways they do” (1980, p. 249). Bowlby, however, goes on to criticize Beck’s lack of attention to developmental origins, describing his assertions as too general and saying little about specific developmental processes. In the intervening years, other theorists have also noted the parallels between Beck’s notion of schemas and Bowlby’s concept of Internal Working Models (IWMs) of attachment (Barrett & Holmes, 2001; Ingram, 2001, 2003; Williams & Riskind, 2004) which is now widely recognized as providing important insights into the cognitive processes that characterize depressive vulnerability (Dozier et al., 2008; Moran, Neufeld-Bailey, & DeOliviera, 2008; Sochos & Tsalta, 2008). Attachment theory, then, seems likely to provide a fruitful framework for exploring the developmental roots of cognitive vulnerabilities to depression.

3. Early attachment and the emergence of a sense of self and others

According to Bowlby (1958, 1969), children develop representations, or IWMs, of attachment figures based on their history of interaction with them; that is, their attachment relationship. These representations subsequently influence the development and maintenance of other relationships throughout the lifespan. Although changes to these models can occur following repeated experiences in subsequent relationships, they are generally expected to be resistant to the integration of contradictory information and, thus, relatively stable. Bowlby (1969, 1973, 1980) further predicted that children would develop a complementary model of the self, based on these attachment representations. He proposed that three distinct qualities of representations of the self and others would emerge as a function of differing experiences in early attachment relationships.

Individuals who develop stable and secure attachment representations are likely to have experienced responsive, consistent and sensitive caregiving from their primary attachment figures in the first months and years of life. Their desires for comfort, support, and exploration were mostly respected and consistently met leaving them confident that important others are available, accessible and supportive during times of need. They develop a complementary model of the self as valuable, lovable, and worthy of consistent support (Bowlby, 1969, 1973, 1980). In contrast, individuals who develop anxious attachment representations, are likely to have experienced inconsistent caregiving where the support and affection of the primary caregiver were largely determined by the caregiver’s own desires. Through such early experiences individuals learn that the actions of others are not contingent on their own needs and they consequently lack a sense of control over their own environments. Additionally, due to concern and preoccupation with caregiver availability, these individuals fail to develop a competent sense of self; they tend to relinquish their own wishes and desires to comply with the demands of important others in their lives. They, thus, permanently tend to rely on the support and approval of others and have doubts regarding their own efficacy and worth (Bowlby, 1969, 1973, 1980). Finally, Bowlby (1977, 1980) hypothesized that the attachment representations of those he characterized as possessing an independence of affectional ties are the product of a critical and unavailable attachment figure who, in particular, repeatedly rejected their bids for comfort from stress. These individuals develop a model of others as unavailable and unsympathetic during difficult times; they are unable to look to their attachment figure, are left to deal with emotionally charged situations on their own and, thus, their self-representation are characterized by self-sufficiency. Bowlby, however, argued that the stability of such representations of independence vary: Some develop a well-organized process for dealing with emotionally-charged situations while others have only a more precarious sense of independence that is easily shattered following stressful life events (Bowlby, 1969, 1973, 1980).

Empirical research linking adult attachment representations with models of self and other has largely supported these theoretical associations (see Mikulincer & Shaver, 2007). That is, concomitant attachment representations appear to have important implications for the esteem in which an individual holds themselves and others. However, this association in and of itself says little about how early non-secure attachment may increase vulnerability to depression. The following section, therefore, examines how representations of the self, founded in early attachment experiences, influence helpless attributions in response to challenging situations—a process previously identified as contributing to risk for depression following negative life events (Nolen-Hoeksema et al., 1986; Peterson, Seligman, & Vaillant, 1994; Seligman & Nolen-Hoeksema, 1987).

4. From attachment to depressive vulnerability by way of representations of the self

As described in the previous section, IWMs of attachment are held to influence multiple aspects of functioning, primarily through their impact on representations of the self and others (Bowlby, 1980). Bowlby reasoned that an IWM would act as an interpretive lens that would give rise to person-specific “cognitive biases” that could have substantial consequences for later development (Bowlby, 1980, p. 232). He focused particularly on the influence of these biases on the response to serious loss and argued that they largely determine the manifestation of an individual’s grief following the death of a loved one. Recent theorists have suggested that IWMs affect interpretations of a wider range of challenging and stressful life events (Dyckman, 1998; Ingram, 2001, 2003; Moran, Neufeld-Bailey, & DeOliviera, 2008; Riskind & Alloy, 2006; Sochos & Tsalta, 2008), providing a link between experiences with primary attachment figures early in life and later processes that place an individual at-risk for depression following a wider range of negative life experiences.

Consistent and supportive caregiving early in life is believed to leave individuals with a secure attachment history confident that other’s positive representations of them will remain even in the face of situations in which they fail (Mikulincer & Shaver, 2007). The resulting stable, positive sense of self leaves secure individuals
unlikely to be threatened by failure; rather, they tend to focus on positive aspects of their experience and on improving their skills and abilities in challenging situations. Working outside of the attachment framework, Dykman (1998) described such individuals as growth seekers; their focus is less related to the outcome of challenging events and more strongly associated with the opportunity to learn and improve during the process. This positive outlook allows them to remain optimistic, rarely making maladaptive attributions or showing negative affect when dealing with challenging experiences (Dweck & Leggett, 1988; Smiley & Dweck, 1994). Smiley and Dweck (1994) have shown that 4 and 5 year-old children who are more concerned with learning goals than performance goals, like Dykman’s growth seekers, fail to display the negative cognitions following failure that are associated with a helpless explanatory style. Rather, these children are more likely to evaluate their skills positively and to persist when faced with a challenge. Consistent with an attachment model, these authors point to the importance of experiences in early relationships that lead to a positive and stable sense of self as the basis of a learning-focused goal-orientation, and subsequently a mastery-oriented approach to challenging situations (Dweck & Leggett, 1988; Dykman, 1998; Rusk & Rothbaum, 2010).

Attachment theory holds that, in contrast, individuals with non-secure attachment histories must continuously strive to establish a stable sense of competency and self-worth, having been unable to do so through their interactions with early caregivers. Here again, Dykman (1998), in his goal orientation model of depression, described validation seekers in a similar fashion: as tending to view challenging or difficult situations as measures of their core traits that have the potential to prove (or disprove) and validate (or invalidate) their self-worth. Furthermore, he argues that, for such individuals, negative experiences during challenging situations carry the implication, not only of incompetence on a particular task, but of low overall self-worth. These attributions lead to a lack of persistence in the face of difficulty because – having concluded that difficulty is indicative of an overall inability – the validation seeker does not expect that increased effort will be of any use. Consequently, interpreting failure through this cognitive framework is likely to place them at risk for the cognitive and behavioral characteristics of helplessness following failure (Dweck & Leggett, 1988). These results are entirely consistent with the suggestion that sub-optimal experiences in early attachment relationships lead to unstable views of the self that place individuals at risk for explanatory styles that can subsequently lead to depression (Dykman, 1998; Mikulincer & Shaver, 2007; Rusk & Rothbaum, 2010).

The foregoing account, drawing on both attachment theory and social-motivational models of depression, reinforces the proposal that positive early attachment experiences act as a protective factor against cognitive vulnerabilities to depression, while negative early experiences – taken as a whole – constitute a risk-factor for these same processes. Bowlby’s early work and subsequent empirical findings, however, point to important distinctions between the cognitive patterns of individuals with different non-secure attachment histories – ambivalent vs. avoidant – that should not be overlooked (Bowlby, 1980; Moran, Neufeld-Bailey, & DeOliviera, 2008).

As mentioned previously, ambivalent attachment develops through experiences with a primary caregiver who is sometimes responsive but at other times inaccessible or rejecting (Ainsworth, Blehar, Waters, & Wall, 1978). This inconsistency presents a substantial challenge to the establishment of a stable and coherent sense of self (Bowlby, 1980). Later in life, these individuals will continuously struggle to establish the sense of self worth that was unavailable to them in their earliest attachment experience. Those with an ambivalent attachment history thus will approach challenging tasks, in Dykman’s (1998) terms, as validation seekers and be subject to a helpless explanatory style following failure.

In contrast, although avoidant individuals are likely to have experienced a pattern of rejection and criticism from their caregivers early in life, the consistency of this pattern can provide, at least for some, the basis of a strategy involving self-reliance and, thus, a more stable sense of self than for those with ambivalent histories (Sochos & Tsalta, 2008). Avoidant individuals who have developed such a well-integrated representation may come to ignore deficiencies in their view of self and others and focus instead on the characteristics of independence that promote positive views of the self (Mikulincer, 1995; Rusk & Rothbaum, 2010). These individuals will not see failure as threatening their basic sense of self worth as, we have argued, would an ambivalent individual seeking validation. Those with successful avoidant strategies may actually approach challenging situations as growth seekers. Others, however, who have failed to establish such a stable sense of self-sufficiency, will have adopted a validation seeking framework and, thus, be threatened following failure and vulnerable to a helpless explanatory style – much like those with an ambivalent history.

These accounts provide a convincing theoretical explanation of the role that early attachment plays in vulnerability to depression; we now turn to an examination of the empirical support for this assertion.

5. Is there empirical research supporting the link between attachment and a helpless explanatory style?

Research guided by this theoretical framework has established clear associations between attachment style in adulthood and a tendency to attribute failure to internal, stable and global characteristics – well established markers of cognitive vulnerability to depression. Several studies have found that individuals who report secure attachments are unlikely to possess helpless explanatory styles (Armsden, McCauley, Greenberg, & Burke, 1990; Barrett & Holmes, 2001; Greenberger & McLaughlin, 1998; Safford, Alloy, Crossfield, Morocco, & Wang, 2004). The corresponding pattern for ambivalent and avoidant attachment styles, however, is less well established. Several studies have shown that a helpless explanatory style is more strongly associated with ambivalent attachment (Man & Hamid, 1998; Sümér & Cozzarelli, 2004). For example, Man and Hamid (1998) found that avoidant and ambivalent individuals did not differ in the extent to which their attributions were stable and global but did find main effects across groups for the internality of negative events: that is, individuals in avoidant relationships were significantly less likely to attribute negative events to internal causes than were those with ambivalent histories. In fact, avoidant individuals were less likely to make such negative attributions even than those in secure relationships. Other studies have produced contrasting results. For example, Gamble and Roberts (2005; see also, Whisman & McGarvey, 1995) found that avoidant attachment mediated the association between early parenting and a helpless explanatory style. More specifically, individuals who reported negative experiences with parents early in life, and subsequently developed a discomfort in intimate relationships, were likely to make internal, stable and global attributions following negative life experiences. This same pattern was not found for ambivalent attachment. Finally, other studies have found that individuals with each of these patterns of non-secure attachment are equally likely to exhibit cognitive vulnerabilities to depression (Kennedy, 1999).

A path to disentangling this inconclusive pattern of results may be offered by research suggesting that individuals with ambivalent attachments may be more likely to display a helpless explanatory style in threatening affiliative or interpersonal situations, while those with avoidant histories are more apt to do so following achievement-related events (Crocker & Wolfe, 2001; Sümér & Cozzarelli, 2004; Whisman & McGarvey, 1995). For example, Sümér and Cozzarelli (2004) found that individuals with ambivalent attachment styles
were more inclined to make negative attributions about themselves following upsetting experiences with a romantic partner than were individuals with secure or avoidant attachment styles. Moreover, research that has combined affiliative and achievement oriented tasks in an aggregate assessment of helpless explanatory styles has sometimes failed to identify differences between individuals with ambivalent and avoidant attachments. For example, Kennedy (1999) reported no significant differences in the extent to which avoidant and ambivalent individuals made internal, stable and global attributions. The questionnaire administered in this study, the Attributional Styles Questionnaire (ASQ; Peterson, 1982) includes equal numbers of both interpersonal and achievement based experiences, leaving open the possibility that those with ambivalent and avoidant attachment styles may have responded differently to these distinct circumstances.

In summary, research has consistently shown that individuals who report a secure attachment style are least likely to attribute negative experiences to internal, stable, and global causes. Although non-secure attachment representations have been shown to constitute a vulnerability to these helpless explanatory patterns, research is less conclusive with regard to whether or not this pattern differs between avoidant and ambivalent attachment. This body of evidence linking adult attachment representations to a cognitive vulnerability to depression is broadly supportive of Bowlby's proposal that attachment representations have important implications for depressive vulnerability.

6. Shortcomings of current empirical support linking attachment to depressive vulnerability

The foregoing brief review of the extant research on the subject might reasonably tempt one to conclude that research has established that early attachment experiences are important determinants of cognitive processes that place individuals at-risk for depression (the links represented by Section 4 in Fig. 1), except that a number of limitations of the research render such a conclusion premature. A comprehensive evaluation of the hypothesis demands prospective longitudinal studies beginning in infancy and an examination of more specific social cognitive mechanisms. Unfortunately, the cost and time associated with longitudinal research has dictated that most studies have been cross-sectional, focused on adolescents or adults and have used self-report rather than observational measures of attachment, and, for the following reasons, provides only a limited suggestion of the developmental origins of depressive vulnerability (Bretherton & Munholland, 2008; Dweck & London, 2004; Thompson, 2008).

6.1. Biased recall of early attachment experiences

Numerous authors have cited concerns over the validity of adolescent and adult recall of early attachment experiences (Gamble & Roberts, 2005; Ingram, 2003). In general, recall of memories from several decades previous can be affected by various factors apart from the experiences themselves (Maughan & Rutter, 1997; Winkielman & Schwarz, 2001). This problem is especially salient when studying depressed individuals who may suffer from biased recall as a result of current negative affectivity (Gamble & Roberts, 2005). The Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) and Critical Parenting Inventory (CPI; Randolph & Dykman, 1998) have been most commonly used to measure experiences with primary attachment figures; both require retrospective recall. Some researchers have suggested that current affect has no impact on recollection of early attachment experiences (Gamble & Roberts, 2005; Ingram, 2001) while others argue otherwise (Brennan, Clark, & Shaver, 1998; Crowell & Treboux, 1995; Whisman & McGarvey, 1995). Beyond this debate, attachment experiences considered most critical in influencing an individual's IWM occur during the first year of life and are preverbal and therefore inaccessible to conscious recall processes upon which adult self-reports rely. Taken as a whole, these considerations raise substantial questions regarding the validity of adult recall as an indicator of early attachment experiences.

6.2. Limitations of assessing attachment in adulthood

Attachment in adulthood is typically measured either with the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) or using a self-report questionnaire. The AAI is a semi-structured interview that assesses an individual's IWM, or state of mind with regard to attachment, by examining the coherence with which they discuss experiences in early attachment relationships. In part as a reaction to the AAI’s laborious administration and scoring procedures, several self-report measures have been created to assess attachment in adulthood. These measures include the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), Attachment Style Questionnaire (ASQ; Feeney, Noller, & Hanrahan, 1994) and Experiences in Close Relationships Questionnaire (ECR; Brennan et al., 1998). Such instruments have dominated previously reported research (Gamble & Roberts, 2005; Strodl & Noller, 2003; Whisman & McGarvey, 1995).

These two approaches to assessing attachment in adulthood differ fundamentally in both procedure and underlying assumptions: The self-report measures rely on explicit semantic and episodic recall of early experiences whereas the AAI implicitly assesses state-of-mind regarding attachment through the quality of discourse regarding those experiences. In spite of these substantial differences, numerous studies have established the validity of both the AAI and self-reports of attachment: Attachment classifications derived from both measures have been associated with theoretically relevant, although distinct, aspects of concurrent functioning (Roisman, 2009: Roisman et al., 2007; Shaver & Mikulincer, 2002). Neither assessment, however, can provide the information that is essential to explore the mechanisms linking early childhood experiences to the cognitive processes underlying a vulnerability to depression. That is, self-report assessments may accurately reflect experiences in current attachment relationships but are an inadequate reflection of actual early experience or, in fact, of past representational processes. Although AAI-based assessments of IWMS are thought to remain relatively stable over time, major experiences throughout life can reshape the representations that emerged from early experiences with the primary attachment figure. Prospective longitudinal studies have found that attachment in infancy rarely shows a simple relationship to representations of attachment in adulthood (Lewis, Feiring, & Rosenthal, 2000; Sroufe, Egeland, Carlson, & Collins, 2005). Additionally, self-reported attachment style in adulthood could equally well be either a developmental antecedent of cognitive vulnerabilities to depression or a consequence of such maladaptive patterns of thinking and/or associated negative affect. In summary, regardless of how theoretically relevant a measure of attachment in adulthood is to representations of attachment early in life, it is not necessarily entirely reflective of experiences in these early relationships — and it is exactly such information that is required if we are to understand their associations with later vulnerability to depression.

Thus, limitations associated with cross-sectional study designs using self-report measures in adulthood have addressed important questions but leave many others unanswered. We now turn, then, to evidence examining the role of attachment assessed early in life as a contributor to the emergence of cognitive vulnerability to depression.

7. Examining the link between attachment and depressive vulnerability with a new lens: A developmental perspective

Several prospective studies have provided valuable information on the developmental trajectory of individuals with different early
attachment histories (Grossmann, Grossmann, & Waters, 2005). Much of this research has examined attachment relationships in infancy and toddlerhood, using the Strange Situation Procedure (SSP), and followed children through development to examine the impact of early attachment experiences on various developmental outcomes. Mary Ainsworth’s Strange Situation Procedure (SSP), a structured laboratory protocol focuses on infant responses to separations from the mother, is considered the gold-standard assay of attachment early in life (Ainsworth et al., 1978; Ainsworth, Bell, & Stayton, 1971). The procedure consists of an initial episode of play between mother and infant, the introduction of a stranger, and two separations and reunions with the mother. Ainsworth identified three distinct patterns of attachment based on the infant’s use of the mother to restore equanimity following a separation: secure, ambivalent and avoidant (Ainsworth et al., 1978) — patterns that closely paralleled the representations of attachment described by Bowlby as stable/secure, anxious and independent respectively. Several prospective longitudinal studies have examined the impact of these early attachment patterns on individual differences in the emergence of IWMs, representations of the self and responses to failure throughout childhood (Cassidy, 1988; Lee & Hankin, 2009; Lewis, Brooks-Gunn, & Jaskir, 1985; Sroufe et al., 2005). We first turn to an examination of the developmental link between early attachment quality and the development of a sense of self and others (see Fig. 1, Section 4).

8. Does early attachment quality influence developing representations of the self and others?

Although it is generally accepted that IWMs develop based on early experiences with primary caregivers, few studies have actually been able to establish the earliest emergence of IWMs. To address this gap, Johnson, Dweck, and Chen (2007) used a visual habituation procedure in an attempt to identify the workings of IWMs of attachment in 12–16 month-old infants. Infants classified as secure in the SSP spent more time looking at an animated display of an unresponsive than responsive caregiver. Given that lengthy habituation is considered a reflection of a stimulus’ novelty and unfamiliarity, this finding suggests that infants classified as secure were more accustomed to the responsive scenario and provides compelling evidence of the activity of distinct IWMs of attachment very early in life.

Further supportive evidence comes from research assessing the influence of early attachment experiences on the development of self-recognition in toddlerhood (Lewis et al., 1985). Self-recognition is an important developmental milestone, providing the basis of the child’s self-concept that influences various social and cognitive processes in later life. Lewis et al. (1985), however, found evidence that premature self-recognition may be reflective of a precocious independence prompted by an inaccessible caregiver. In this study, a mark was placed on the infant’s nose before situating him in front of a mirror; behavior directed toward the mark was considered indicative of self-recognition while actions focused on the mirror were not. Eighteen month-old infants classified at 12 months as non-secure were more likely to show mark-directed behavior, and less likely to exhibit mirror-directed behavior. These results were taken as evidence that early experience in a non-secure relationship with an unsupportive caregiver require an individual to develop a precarious emotional independence that is associated with an earlier recognition of the self.

The link between early attachment and development of the self throughout childhood was investigated in the 30-year Minnesota longitudinal study of high-risk mother–infant dyads during which children were assessed in the SSP in infancy and followed throughout development (Carlson, 1998; Sroufe, 2005; Sroufe et al., 2005). At age 4.5 children were invited to explore the curiosity box, an unusual contraption with various features to open, pull, and manipulate (Sroufe et al., 2005). Laboratory observations indicated that those classified as ambivalent in infancy, but not those who were avoidant or secure, displayed low levels of self-reliance and self-esteem during this task. Further assessments of self-reliance, self-esteem, and self-confidence by classroom teachers over the following 6 months consistently found that individuals with non-secure attachment histories, including those in both avoidant and ambivalent relationships, were ranked lower than those with secure histories.

Cassidy (1988) also examined the association between early attachment experiences and a child’s self-perceptions and self-esteem. Although this study was cross-sectional, its carefully chosen methods are especially instructive. Few studies have examined these constructs as early as 6 years of age. Attachment was assessed using a separation and reunion procedure that has established associations with infant attachment in the SSP (Main, Kaplan, & Cassidy, 1985). Finally, multiple measures were used to assess representations of the self: a puppet interview, self-interview, and a set of scales assessing perceived competence, social acceptance (Harter & Pike, 1984), and global self-esteem (Harter, 1982). During the puppet interview, the interviewer addressed questions about the child to the puppet to which the child then provided responses. These responses were taken to represent the esteem in which the child believed themselves to be held by others. The self-interview was used to address these same concepts through direct questioning of the child. Results from both interviews indicated that individuals in secure relationships were most likely to provide positive – but realistic – descriptions of the self; individuals with avoidant attachments most often responded positively in all domains, admitting to few or no flaws; and those with ambivalent attachments showed a less consistent pattern, typically providing either a negative or an unrealistically positive description of the self. Self-perceptions of acceptance, competence, and self-esteem also were assessed based on the child’s identification with various descriptions of children in a range of circumstances (Harter, 1982; Harter & Pike, 1984). The responses of children in secure attachment relationships on these measures reflected higher self-esteem and a tendency to describe themselves as more competent and better accepted than those in both avoidant and ambivalent relationships.

While findings from the puppet- and self-interviews in this study indicated that individuals with an avoidant attachment style tend to possess very high opinions of themselves, the scales assessing competence, acceptance, and global self-esteem suggested otherwise. Cassidy (1988) proposed that the disparity was a function of the differences in the presentation of questions related to self-esteem. While, Harter’s scales (Harter, 1982; Harter & Pike, 1984) are designed to reduce defensive reactions by presenting both positive and negative traits as common and acceptable, both the puppet and self-interviews are more transparent assessments that may elicit defensive reactions in individuals who have difficulty admitting their weaknesses. Avoidant individuals may present as overly confident – as was the case for both the puppet and self-interviews – when an honest response would involve acknowledging flaws that are inconsistent with a model of self-sufficiency. Conversely, when alternatives are presented that do not represent a weak or undesirable trait, as they were for the scales of acceptance, competence and global self-esteem, more vulnerable aspects of the self-concept can be revealed.

The Minnesota longitudinal study also provides a rare example of assessing the relation of early attachment to representations of self in middle childhood (Sroufe, 2005; Sroufe et al., 2005). At age 10, teachers rated each child’s overall emotional health and self-esteem reflected in their confidence, curiosity, self-assurance, engagement, and eagerness for new experiences and challenges. Results indicated that secure attachment in infancy was predictive of positive global scores in this domain in elementary school.

While this illustrative review reveals a number of studies examining the influence of early attachment on subsequent representations of self and others, there is a dearth of longitudinal research specifically examining associations between attachment in infancy and the emergence, in early childhood, of the specific cognitive processes that
are seen as a vulnerability to depression. Here again, however, the Minnesota longitudinal study may provide some important insights by way of its observations of responses to challenging situations across early to middle childhood as a function of early attachment history.

9. Does early attachment influence helpless responses to failure in childhood?

To examine associations between early attachment and response to a challenging task, Sroufe et al. (2005) administered a series of four tasks to two-year-old children in the presence of their mothers. Each task was incrementally more challenging, with the final task well beyond the capabilities of a 2-year-old (Matas, Arend, & Sroufe, 1978). Children found to be in ambivalent attachment relationships in infancy lacked the confidence and persistence characteristic of individuals with secure and avoidant histories. Further assessments were carried out on these same children at age 3.5 (Rahe, 1984, as cited in, Sroufe et al., 2005) when a series of four teaching tasks were completed with the mother in the room, followed by a challenging task administered to the child alone. Observations during the teaching tasks again indicated that individuals with ambivalent histories were rated significantly lower on persistence, enthusiasm and compliance than children in the other two attachment groups.

These same children were also observed in the mother’s absence during a particularly taxing experience referred to as the barrier box situation (Arend, 1984; Sroufe et al., 2005). This task required the child to attempt to open a locked box in order to access a set of desirable toys, an almost impossible assignment. Competence on this task was judged by the extent to which children displayed agency, flexibility, focus, persistence, and positive affect. Children with secure attachment histories were significantly more likely to show competence than those with non-secure histories. Aspects of performance on these tasks also were predictive of teacher ratings of self-esteem and emotional competence over 6 years later with persistence being an especially strong predictor (r = .38).

While individuals in secure and ambivalent relationships exhibited consistent responses to both the barrier box situation and teaching tasks, those in avoidant relationships did not. During the teaching tasks, avoidant individuals were compliant and showed enthusiasm and persistence, however, they were among the least competent when presented with the barrier box situation. It may be that individuals with avoidant histories are able to maintain positive affect and persistence in moderately difficult situations but that the challenge of an insoluble task proved too stressful for them to maintain a sense of efficacy. Although conjecture, this suggestion is consistent with the previously described theoretical proposal that significant threats to self-esteem can compromise the relatively stable representational models of self-sufficiency of avoidant individuals (Bowlby, 1980). In contrast, those with secure attachments anchor models of themselves on more enduring qualities, including the availability of others, and therefore assess their abilities more positively, even in the face of unsolvable and very frustrating challenges. These findings provide some preliminary support for theoretical models that suggest responses to challenging situations are based on representations of the self, established through early experiences in attachment relationships (e.g., Dykman, 1998) (see Fig. 1, Section 4).

10. The case of disorganized attachment

For several decades following introduction of the SSP, attachment relationships were classified by how closely they fit one of the three patterns originally identified by Mary Ainsworth, the same patterns that have been the focus of our review: secure, avoidant or ambivalent. However, a sub-set of dyads in many samples, particularly those involving high-risk populations, was difficult to classify using these three categories. As a result, a fourth category, Disorganization, was developed to accommodate such previously unclassifiable dyads (Main & Solomon, 1986). An infant identified as Disorganized in the SSP displays anomalous and atypical behaviors, such as freezing or inexplicable repetitive movements, during interactions and reunions with their mother (Main & Hesse, 1990). In contrast to the original non-secure attachment styles that represent adaptive patterns organized around caregiver behavior, infants in Disorganized relationships are seen as prone to the breakdown of these strategies under stress. Such individuals are also given a secondary classification of secure, avoidant or ambivalent to reflect the underlying strategy. Disorganized attachment is currently viewed as a product of maternal behavior experienced by the child as atypical, frightened, or frightening (i.e., sudden looming over infant, failure to respond to clear signals, fear grimaces, etc.) rather than as a result of variations in maternal sensitivity, as typically associated with secure/non-secure distinctions (Main & Hesse, 1990). Main and Hesse (1990) propose that frightened and frightening maternal behavior are a source of alarm for the child that give rise to desires to both approach and, at the same time, to take flight from the caregiver. These conflicting emotions and motivations are seen as resulting in the anomalous and atypical behavior characteristic of Disorganized attachment. However, extremely critical and unsympathetic parenting have also been linked to Disorganization in high-risk samples (Bernier & Meins, 2008; Carlson, 1998; Moran, Forbes, Evans, Tarabulsy, & Madigan, 2008; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999) suggesting that extreme levels of maternal insensitivity may also contribute to the development of Disorganization in some populations. Disorganized attachment is highly prevalent in samples of maltreated children, suggesting that parental behaviors associated with neglect and various forms of abuse may also play a role in the development of this pattern of attachment (Baer & Martinez, 2006).

Most existing prospective longitudinal studies of attachment began prior to the introduction of the Disorganized classification (Sroufe, 2005). However, a recoding of a subset of infants from the Minnesota longitudinal study enabled an examination of the developmental sequelae of Disorganization (Carlson, 1998). The key finding of these analyses was that Disorganized attachment was strongly associated with psychological malfunctioning, including depressive symptomatology, in early adulthood. These findings suggest that the Disorganized attachment classification represents an important early indicator of risk for psychopathology, although the mechanism underlying this association remains largely unexplored.

Some insight into this process may be found in an exploration by Solomon and George (1999) of the relation of Disorganization to Bowlby’s original theory. These authors remind us that much of Bowlby’s original work was actually founded on observations of clinical samples and malfunctioning individuals, most of whom would likely today be classified as Disorganized. Thus, although his work obviously predates the category, Bowlby’s conclusions regarding the role of early caregiver behavior in the development of IWMs and associated cognitive biases that place individuals at risk for depression may in fact be most characteristic of those individuals who are both non-secure and Disorganized. While, as we have argued here, those with avoidant or ambivalent attachment histories are likely to be vulnerable to depression as a result of the cognitive biases they develop in early childhood, they also possess certain adaptive cognitive features that provide them with some degree of protection. For example, although individuals with avoidant histories generally lack confidence in others, they are typically able to rely on themselves in many challenging situations. Similarly, while those with ambivalent histories often develop negative representations of themselves, they are generally comfortable depending on others in times of need. Individuals with avoidant or ambivalent histories who are also Disorganized, however, are liable to experience a breakdown of their underlying organized strategy when stress is high, depriving them of any of these potential coping resources, predisposing them...
to maladaptive responses to stress, and leaving them vulnerable to depression.

A review of 20 studies of Disorganization found that the vast majority of individuals who were classified as Disorganized also have an underlying strategy that is either avoidant or ambivalent, not secure (van IJzendoorn et al., 1999). Thus, many Disorganized individuals may be especially vulnerable to depression: first, as a result of the vulnerabilities associated with the underlying non-secure strategies that have been the focus of our review, and second, because even these strategies are particularly vulnerable to fail them in stressful circumstances.

11. A mechanism linking attachment to depressive vulnerability: A synopsis of current evidence

Our review of the association between early attachment experiences and representations of the self and cognitive vulnerability to the onset and maintenance of depression builds on previous research with adult participants by providing preliminary evidence of a developmental association. Prospective longitudinal studies have provided empirical support for theoretical associations between early attachment experiences and both representations of the self and responses to challenging situations in early childhood (Cassidy, 1988; Johnson et al., 2007; Lewis et al., 1985; Sroufe et al., 2005) (see Fig. 1, link between Sections 3 and 4).

Overall, these findings support the theoretical notion that early secure attachment is associated with competence and confidence across multiple domains (Sroufe, 2005; Sroufe et al., 2005). Laboratory observations indicate that securely-attached children approach challenges with an optimism and persistence that are likely to lead to enjoyable experiences, even on challenging tasks. For children with early non-secure attachments, however, experiences with an unresponsive or inconsistent caregiver appear to negatively impact representations of the self as early as toddlerhood, and impair the child’s ability to handle challenging or difficult situations.

Those with ambivalent attachment histories appear to experience the greatest difficulties in these domains, demonstrating frustration, negative affect, low competence and a lack of persistence in such situations (Sroufe, 2005). These findings are consistent with Bowlby’s proposal that ambivalent attachment is associated with both an unstable sense of self and lack of competence as a result of early experiences with an inconsistent caregiver.

Findings have been less consistent with regard to representations of the self and responses to challenging situations for individuals with avoidant attachment histories. In some tasks avoidant individuals come across as competent and persistent while in others they appear to lack such desirable characteristics. These disparate findings could arise from a number of sources.

First, the method used to assess representations of the self may influence responding among individuals with avoidant attachment histories (Cassidy, 1988). While explicit self-reports are likely to produce exaggerated positive responses, more subtle or implicit measures may pick up on more vulnerable aspects of the self-concept. Second, these inconsistent findings may, to some extent, represent a true disparity in representations of the self among individuals with avoidant attachment histories. As indicated previously, Bowlby (1980) hypothesized that experiences with a critical and unsympathetic attachment figure early in life may have distinct influences on the IWMs of different individuals. More specifically, some will emerge “... competent and to all appearances self-reliant, and they may get through life without overt sign of breakdown,” however, for others, “hardness and self-reliance are more brittle and it is from amongst these persons, it seems, that a substantial proportion of all those who at some time in their life develop a pathological response to loss are recruited” (Bowlby, 1980, p.225).

Finally, findings from the adult literature suggest that the type of experiences utilized in studies examining self-esteem and response to failure may influence the response of those with non-secure attachment styles (Crocke & Wolfe, 2001; Whisman & McGarvey, 1995). It has been proposed that while individuals with avoidant attachment histories may display helpless explanatory styles following achievement-related failures, they will be less affected by interpersonal based failures — those with ambivalent attachments are expected to demonstrate the opposite pattern of responses. Preliminary support is available for this suggestion: increasing difficulty in achievement-related situations is associated with decreases in self-esteem for children in avoidant attachment relationships (Sroufe et al., 2005). Research involving children in ambivalent attachment relationships at-first appears inconsistent with this suggestion. That is, those with early ambivalent attachments display negative affect and a lack of persistence in achievement-oriented tasks. However, the inconsistency may be resolved by considering the fact that the super-ficially performance-based laboratory task is rendered interpersonal by the presence of both the child’s mother and the experimenter. Domain-specific vulnerabilities to depression for individuals with distinct non-secure attachment histories are clearly an important area for further investigation.

As we have noted, although much is still to be learned about the developmental trajectory of individuals classified as Disorganized in infancy, longitudinal research indicates that it represents an important early indicator of risk for psychopathology much later in life. As we have argued here, this pattern of attachment may reflect a particular vulnerability because Disorganized individuals are likely to display the same vulnerability to cognitive biases and subsequent depression as those with ambivalent and avoidant histories but are additionally at risk because of their propensity to experience a breakdown of even these non-secure strategies under stress. However, more detailed observations over multiple time periods throughout infancy and childhood are necessary to test this hypothesis and better understand the mechanisms linking early attachment Disorganization with later depression.

Thus, prospective longitudinal research with children lends some support for the proposal that early attachment experiences impact developmental processes that constitute a risk for later depression — but there are still important gaps. Fig. 2 provides a summary of our illustrative review by way of a schematic overview of the relative strength of existing empirical evidence in support of the theoretical model that we introduced at the outset. The gaps and weaker links in this figure might usefully inform future research and clinical practice, topics that we now address in the concluding section of this paper.

12. Attachment and depression: The current state of play

The foregoing summary indicates that extant findings from prospective longitudinal studies beginning in infancy have generally confirmed suggestions emerging from the adult literature linking attachment style to both the development of the self and responses to challenging situations. The evidence for this developmental link, however, stems from only a few studies and further research will be necessary to complete what is still a patchy and unclear understanding of the role that early attachment experiences have in influencing these developmental outcomes.

Perhaps the most urgent need is for research specifically examining the influence of attachment experiences in infancy on cognitive vulnerabilities to depression emerging in early childhood. Although several studies now have examined links between early attachment and behavioral responses to challenging situations at this age (Sroufe, 2005; Sroufe et al., 2005), none of these studies have identified the helpless attributions that theory would predict would be provoked in such situations. The extent to which individuals make stable, internal, and global attributions following failure has been
shown to have a pivotal role in the onset and maintenance of depression. Only once research has established that such cognitive biases mediate the association between early attachment experiences and later vulnerability to depression will the full model of development be confirmed. Such work is now possible as a result of recent methodological advances in the assessment of negative cognitive patterns in early childhood (Kistner et al., 2001; Smiley & Dweck, 1994; Ziegert et al., 2001). Findings from such research could directly support the central hypothesis that early attachment experiences influence the development of negative cognitive patterns that place individuals at-risk for depression following stressful life experiences.

Given the high cost of depression to the individual, family, and health care system, developing early interventions that decrease the onset or severity of later depression are of critical importance. A greater understanding of the actual experiential mechanism of this developmental association is imperative for informing early interventions aimed at decreasing risk for depression. For example, providing parents with the skills and resources necessary to support and guide their children through challenging situations may increase the child’s capacity for responding to similar situations on their own at a later time. Additionally, these findings have implications for interventions with children who have a history of non-secure attachment. Intervening at the level of self-representations by improving confidence and self-esteem in children who were unable to develop stable representations of the self through early attachment experiences may decrease the experience of helpless explanatory styles following failure, and subsequent symptoms of depression. However, more research into these processes using prospective longitudinal research is necessary before conclusive implications for clinical intervention can be made.

A clearer understanding of the role that early attachment experiences play in depressive vulnerability may also inform research on the role that epigenetics and gene/environment interactions play in this disorder. Recent theory and empirical research suggest that not all children are equally influenced by experiences in early attachment relationships. For example, Belsky (2005) has argued that certain children are more susceptible to early environmental experiences due to variation in their genetic make-up. At first glance, this position and supportive findings may appear to undermine the importance of the conclusions drawn in the current review that point instead to early attachment experiences. However, the model allows for the possibility that differential susceptibility may also be a product of early experience (Belsky, 2005) or, indeed, a complex interaction of experience and genetic predispositions (Boyce & Ellis, 2005; Ellis, Boyce, Belsky, Bakermans-Kranenberg, & van Ijzendoorn, 2011). The conclusions of the current review, thus, may actually complement emerging models of the impact of genetics on the onset and maintenance of affective disorders (see Pezawas et al., 2005). Exciting work in the area of epigenetics has led to the wide acceptance that early environmental experiences play an important role in the association between genomic sequencing and expression of a particular trait: “…research in biology reveals that the genome cannot possibly operate independently of its environmental context” (Meaney, 2010, p. 42). We have tried here to provide a picture of the environmental influences that are likely interacting with, or altering the expression of, particular genomic sequences that can lead to depressive vulnerability. Further research assessing the associations between these environmental processes, and genotypes that have been associated with risk for depression, will undoubtedly reveal a complex interplay of environment and genotype that leave some more vulnerable to the development of depression than others.

The citing of this final direction for future research – emerging epigenetic processes that once and for all reveal the fallacy of the nature/nurture distinction – provides a fitting bookend to this exploration of the role of early attachment experiences in shaping a vulnerability to depression. Its inclusion, first, signals the challenge of interweaving biological factors into the already complex social-cognitive processes that have been the focus of this review. In addition, however, it underscores our theme that, although cross sectional studies in adulthood have provided invaluable clues, our understanding of the details of the mechanisms of vulnerabilities to depression – whether arising from genes, experience, or both – can only emerge from longitudinal studies tracking the developmental links between early experience and the social-cognitive processing underlying depression in later life.

**Acknowledgements**

The authors would like to acknowledge the members of the Moran/Pederson research group who contributed to this paper in various...


