Identifying Early Markers of Childhood Depression Using
the NICHD-SECCYD Longitudinal Dataset

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Dedication

This is for my children, the most competent young people I know. Their smiling faces, unconditional love, curiosity, and joyous outlook reminded me of the importance of savoring each moment, and living life fully. They are truly the greatest gifts in my life. I hope my example encourages them to reach for their dreams. Mama’s “book” is done!
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I would like to acknowledge my family and friends without whom this whole process would have been a struggle. I feel so lucky to know so many bright, thoughtful, and successful people. They supported me, kept me laughing, and most importantly loved me throughout my years as a doctoral student.
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Thanks for helping me dream big!
RELATIONS BETWEEN COMPETENCE AND DEPRESSION

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Abstract

This study tested Cole’s (1990) competence-based model of depression in children using the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD) dataset that included over 1,000 participants from diverse families. Data collected from multiple informants (parent, teacher, participant, and research assistant), at three time intervals (first grade, fifth grade, and ninth grade), on three domains of competence (social, academic, and behavioral), and depression was analyzed. In support of Cole’s competence-based model, results from regression analyses showed that social competence and behavioral incompetence were significant, yet modest predictors of future depression for boys and girls. Academic competence was a weak predictor of future depression for girls only. The strongest predictor of future depressive symptoms was prior depressive symptoms, indicating early-onset depression can mark a chronic course.

While competence levels do not precisely identify children at high risk for experiencing depression, they are valuable markers of risk that can be used to broadly screen vulnerable children. Skill-oriented programs can strengthen resilience in vulnerable children by fostering the development of competence across multiple salient domains. Schools are ideal sites to provide these programs because children spend a significant part of their childhood in school, and developing competence across many domains is already a primary focus of formal education.

The electronic version of this dissertation is freely accessible through the OhioLINK ETD center (http://www.ohiolink.edu/etd/).

**Keywords:** depression, social, academic, and behavioral competence, children, longitudinal study
Prior to the 1970s, childhood depression was scarcely recognized and mood disturbances were considered a normal aspect of youth development (Clarizio, 1989; Duggal, Carlson, Sroufe, & Egeland, 2001). Then a surge of research conducted in the 1980s provided evidence that in the general population, 10% to 15% of children experience moderate to severe symptoms of depression at any one time (Fleming & Offord, 1990; Nolen-Hoeksema, Girgus, & Seligman, 1992). Today there is widespread recognition that mood disorders can manifest and be identified in young children.

Furthermore, there is mounting evidence for the continuity of depression over time: at least 50% of young children who meet criteria for major depression will continue to experience episodes of depression into adulthood (Kessler, Avenevoli, & Merikangas, 2001). Adolescents who were formerly depressed continue to exhibit characteristics common to depressed individuals even after they no longer meet criteria for the disorder. Children who experience even subthreshold levels of depressive symptoms at a young age are more likely to experience episodes of major depression in adulthood (Avenevoli, Knight, Kessler, & Merikangas, 2008). Interestingly, adults whose first episode of depression occurred in adulthood recover more quickly than children who experience an episode of depression in childhood (Lewinsohn et al., 1994). Further, individuals with adult onset depression look similar to never depressed adults after the episode passes (Lewinsohn et al., 2004). These findings demonstrate that the earlier the onset, the longer it takes to recover from a mood disorder (Clarizio, 1989).

Experiencing an early-onset mood disorder leads to a whole host of negative consequences that are widespread and long lasting (Lewinsohn et al., 1994). Depressed children experience impairment in school performance, disruption in relationships, more suicidal or homicidal ideation, and higher rates of alcohol and substance abuse (Birmaher et al., 1996;
Lewinsohn et al.). Furthermore, they lack coping skills, exhibit pessimistic thinking, and have low self-esteem, and these problems persist after the depressive episode subsides (Lewinsohn et al., 2004). Another consequence is the great costs to society: depressed youth have lower educational attainment, smoke more cigarettes, have earlier pregnancies, exhibit more physical problems, experience financial adversity, and have poorer global functioning (Birmaher et al.; Kessler & Walters, 1998). Many believe experiencing a depressive episode in childhood is associated with a more serious, chronic form of the disorder compared to adult onset depression (Lewinsohn et al., 1994), and that during middle childhood early-onset psychopathology crystallizes and becomes a stable impairment with lifelong consequences (Kohlberg, LaCrosse, & Ricks, 1972). Thus, early childhood marks a prime time to identify those children most at risk for experiencing depression.

One of the best predictors of successful development is the presence of various forms of competence (Kohlberg et al., 1972). A major developmental task of childhood is establishing competence across many salient domains. Not surprisingly research finds significant inverse correlations between children’s competence and depression (Bleichman, McEnroe, Carella, & Audette, 1986; Cole, 1990). Children who struggle to develop competence are more vulnerable to ongoing problematic functioning (Cicchetti, 1993). However, because competence difficulties and psychopathology often co-occur untangling the specifics of this relationship has been difficult.

David A. Cole and his colleagues embarked on research to examine the relationship between competence and depression. Emerging from this research is Cole’s (1990) competence-based theory of depression in childhood. The primary tenet of this model is that deficits in competence function as a major pathway to depression in childhood. Cole posits that
children who exhibit deficits or perceive failure at developing competence in age-salient domains are more likely to experience depressive symptoms (Cole, 1991). He specifically argues that a major consequence of exhibiting skill deficits is receiving persistent and pervasive negative feedback, which interferes with children’s ability to develop complex, positive self-concepts, and places them at risk for depression (Cole, 1991). Thus, he proposed that a central marker and possible mechanism of children’s vulnerability to depression is their level of actual and/or perceived competence (Garmezy & Masten, 1991).

This study replicated and extended Cole, Martin, Powers, and Truglio’s (1996) research linking competence evaluations to later depression. Using a longitudinal dataset of over 1,000 school-age children, including data from multiple informants (self, parent, teacher, and research assistants), this study examined the relations between three domains of competence (social, academic, and behavioral) and depression across an eight-year span in childhood. The analyses replicated and extended previous findings that competence levels in first grade are weak predictors of future depression.

The following section reviews the literature and presents findings from this study. Diagnostic criteria and prevalence data on major mood disorders in children are outlined, with special attention given to age specific differences in symptom expression. Also, well-known risk factors and consequences associated with early-onset depression are explored. The current state of knowledge in this area is complex as many factors function as risk factors, correlates of depression, and sequela to the experience of a depressive episode. Additionally, rarely does one factor predict depression; rather depression emerges due to the cumulative risk of many factors. Therefore, risk factors are presented within a diathesis stress model of psychopathology. Then, Cole’s competence-based theory of depression in childhood is presented to provide a guiding
framework for this research. Finally, the results of this study are presented along with a discussion of the relations between competence and depression and the implications for Cole’s competence-based theory.
Literature Review

Depression in Childhood

In the Diagnostic and Statistical Manual, 4th Edition, Text Revised (DSM-IV-TR; American Psychiatric Association [APA], 2000), depression is defined as a mood disorder with two subtypes: major depressive disorder (single episode or recurrent episode of depression) and dysthymic disorder (chronic disturbance of mood). In the literature, mood disorders are operationalized three ways: (a) a psychopathological disorder defined by a categorical diagnostic system such as the criteria outlined in the DSM-IV-TR, (b) a syndrome defined by a cluster of symptoms (i.e., low self-esteem, sadness, suicidal ideation), and (c) a mood problem identified by the presence of a single major symptom (i.e., dysphoric mood; Cicchetti & Toth, 1998; Kovacs & Lopez-Duran, 2010). For the most part, adult conceptualizations have been applied to describe depression in children.

Diagnosing depression. To diagnose depression as a psychopathological disorder, DSM-IV-TR criteria for major depression are used for all individuals regardless of age. The prevailing belief is that when depression is assessed at this high level, the core symptoms are stable across development, thus warranting only one diagnostic system (Cicchetti & Toth, 1998; Birmaher et al., 1996). The essential feature of the disorder is a depressed mood accompanied by a loss of interest in all activities, which must persist for most of the day, for at least two weeks (APA, 2000). The individual must also report at least four additional symptoms including: (a) changes in appetite, weight, sleep, or psychomotor activity; (b) decreased energy; (c) feelings of worthlessness; (d) difficulty thinking; or (e) recurrent thoughts of death.

Depression is also operationalized as a syndrome or mood disturbance in research that uses self-report checklists to determine the presence of symptoms. The Children’s Depression
Inventory (CDI) is the most commonly used self-report measure; a score of 17 or above is a typical threshold for identifying the presence of a mood disturbance (Craighead, Curry, & Ilardi, 1995). More specifically, sadness, self-hate, crying spells, irritability, and loneliness are the most sensitive indicators of depression among children and adolescents (Craighead et al., 1995).

There is mounting evidence to suggest that when depression is operationalized as a syndrome or problem with mood, developmental differences between children and adults are noted (Craighead et al., 1995). In a review of studies examining the stability of depression across development, Weiss & Garber (2003) reported that, “it may be premature to conclude that depression is developmentally isomorphic at either the symptom or syndrome level” (p.423). Age of onset may determine different pathways to and experiences of depression (Weiss & Garber). For example, the specific context in which impairment is noted changes depending on age; for example, cognitive deficits are evident in the school context for children and in occupational problems for adults (Lewinsohn et al., 1994). Evidence also suggests that some symptoms are expressed differently, qualitatively and quantitatively, depending on age.

**Age differences in symptom expression.** Worchel, Nolan, and Willson (1987) found that young children respond qualitatively differently than adolescents and adults to 19% of the items on the CDI. For example, items on the CDI assessing vegetative symptoms were not related to depression among preadolescents (Craighead et al., 1995). Older children express anhedonia, hopelessness, hypersomnia, weight gain, social withdrawal, psychomotor retardation, psychosis, and suicidality at higher levels than younger children (Birmaher et al., 1996; Weiss & Garber, 2003). Younger children are more likely to express somatic complaints and exhibit social withdrawal (APA, 2000). Further, psychomotor agitation may manifest as irritability or be expressed through tantrums in younger children (Carlson & Kashani, 1988). Finally, it is
common for children to present with subthreshold levels of depression that do not meet diagnostic criteria due to the duration and/or severity of the symptom. But, these subthreshold manifestations result in as much impairment for the child as being diagnosed with major depression (Avenevoli et al., 2008).

**Prevalence rates.** Depressive disorders are quite common among youth, with some estimates indicating that 9% of youth will experience at least one episode of major depression by the age of 14 (Lewinsohn, Rohde, Seeley, & Fischer, 1993) and 20% to 24% reporting an episode by the age of 19 (Merry & Spence, 2007). There is a steep increase in incidence of depression during adolescence--half of all first episodes occur during this time (Gladstone & Beardslee, 2009). Estimates of incidence of depression range from 1% to 4% in prepubertal children and 3% to 15% among adolescents (Avenevoli et al., 2008; Birmaher et al., 1996).

The way studies operationalize and measure depression contributes to the wide range of prevalence rates. Estimates based on diagnostic interview tend to be lower than rates based on self-report scales (Kessler et al., 2001). Youth exhibit high rates of subthreshold depression; therefore, studies that consider the frequency, severity, and duration of individual symptoms will undoubtedly capture more children experiencing some level of mood disturbance than studies utilizing interviews to diagnose clinical depression (Abela & Hankin, 2008a; Bettge et al., 2008).

**Risk Factors for Depression in Childhood**

There is wide agreement that depression is a heterogeneous disorder that involves the complex interplay of biological (i.e., genetic, neurobiological), family (i.e., maternal depression), and individual (i.e., cognitive, socioemotional) components (Cicchetti & Toth, 1998; Egeland, Pianta, & Ogawa, 1996). Risk factors can be single events, individual characteristics, or ongoing hardships in a person’s life (Werner, 1989 as cited in Carbonell, Reinherz, & Giaconia, 1998).
While many factors have been identified (i.e., maternal depression, severe stressors, low self-esteem, living in poverty), the function of each is often unclear (i.e., risk factor, correlate, consequence; Beardslee & Gladstone, 2001). Some factors appear to be predictive of future depression (i.e. conflict with parents), others associated with current or past depression (i.e., disruptive behavior, current anxiety), and others only predictive of the recurrence of depressive symptoms, but not predictive of a first episode (i.e., failure to do homework; Lewinsohn et al., 1994).

Rarely does one factor strongly predict the onset of depression (Cicchetti & Toth, 1998). One’s vulnerability to depression depends on a number of risk factors that occur in concert with stressful life experiences (Ingram & Price, 2001). In the absence of stress, vulnerable individuals are not identifiable and are no more likely to exhibit depressive symptoms than anyone else. Stressful life experiences trigger the mechanisms that are at the heart of the disorder (Ingram & Price, 2001). Thus, risk factors do not always point directly to causes or treatment targets for psychopathology, but are important markers of vulnerability (Ingram & Price, 2001).

**Biological risk factors.** One genetic pathway to depression is the 5-HT transporter gene on chromosome 17 (Goldberg, 2006). Individual’s born with a long version of this gene exhibit greater stress resistance than those born with a short gene. In fact, when exposed to four or more life stressors the stress resistant group has a 9% risk of experiencing depression whereas the stress sensitive group has a 40% chance of experiencing depression (Goldberg, 2006).

A second pathway is the reactivity of the hypothalamic-pituitary-adrenal (HPA) axis. The HPA is an area of the brain involved in stress response and it is different in depressed versus nondepressed children (Kovacs & Lopez-Duran, 2010). Both genetic and early life experiences, such as maternal attachment behavior, maltreatment, and emotional deprivation influence the
reactivity of the HPA (Goldberg, 2006). Children with a highly sensitive HPA axis are more apt to have a hyper-reactive response to stress, which alters their neurochemical composition and makes them more vulnerable to experiencing depressive symptoms (Goldberg, 2006).

A third pathway involves cortisol levels. Cortisol is a well-studied stress hormone that is consistently linked to depression (Nantel-Vivier & Pihl, 2008). Children with high levels of cortisol in the morning are more likely to be diagnosed with major depressive disorder 12 months later (Kovacs & Lopez-Duran, 2010).

These genetic pathways procure risk when environmental factors that also increase vulnerability are present. For example, in the presence of stressors, genetically at risk individuals exhibit (a) poor recovery after experiencing a stressor, (b) chronically high levels of physiological arousal, (c) affective reactivity, and (d) poor recovery from feelings of sadness about the stressful event (Kovacs & Lopez-Duran, 2010).

**Family risk factors.** Family history of depression is a robust predictor of depression in children (Kovacs & Lopez-Duran, 2010). In fact, children with depressed parents are three times more likely to have a lifetime episode of major depression than children of nondepressed parents (Birmaher et al., 1996). Genetic factors are estimated to account for 50% of the transmission of mood disorders (Birmaher et al., 1996). However, the risk is not all genetic. When a parent struggles with depression, the overall emotional climate within the family changes (Duggal et al., 2001).

Similar to genetic risk factors, the pathways from family adversity to depression are not always direct. Children exposed to a chaotic family environment exhibit more disruptive behavior, lower self-esteem, and poorer health (Cicchetti & Toth, 1998; Duggal et al., 2001). Some proposed mechanisms by which family adversity results in depression include poor
parenting (i.e., rejection, neglect), problematic parent-child relationships, marital discord, and exposure to violence (Avenevoli et al., 2008; Beardslee & Gladstone, 2001). These consequences challenge children’s ability to develop (a) effective affect regulation and coping skills, (b) positive self-esteem, and (c) adaptive cognitive styles (Duggal et al., 2001; Lewinsohn et al., 1994).

**Individual risk factors.** Past psychopathology, temperament, a problematic cognitive organization, and conduct problems are individual risk factors known to relate to the onset of depression in children (Lewinsohn et al., 1994; Mazza et al., 2009). For example, prior depression is one of the best predictors of future depression (Mazza et al., 2009). In a longitudinal study with 938 students, children in first grade who reported feelings of anxiety and/or depression were more likely to experience depression seven years later (Mazza et al., 2009). Temperamental characteristics such as shyness and emotionality are also risk factors for depression (Karevold, Roysamb, Ystrom, & Mathiesen, 2009). A difficult temperament at 5-months old was the most predictive factor for membership in a group of preschool through elementary school students characterized by high levels of depressive/anxious symptoms (Cote et al., 2009). Again, the actual mechanism through which these risk factors relate to depression is not always clear. For instance, children with difficult temperaments are known to challenge their parent’s ability to parent effectively, which creates more adversity in their life.

Further, conduct-related problems such as aggression, stubbornness, being demanding, and exhibiting angry moods in preschool and early childhood are predictive of later internalizing problems (Beardslee & Gladstone, 2001; Mazza et al., 2009). The bulk of research links early problematic behaviors to future externalizing problems (Mesman, Bongers, & Koot, 2001). However, there is growing evidence of a link between behavior problems and internalizing
problems that is reciprocal and complex (Wolff & Ollendick, 2006). Further, conduct problems and depressive disorders arise simultaneously at significantly higher rates than would be expected by chance (Wolff & Ollendick, 2006).

**Cognitive risk factors.** Cognitive vulnerability is a well studied risk factor for depression in adults. There are several cognitive models of depression that each view vulnerability a little differently. But, “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” (Abela & Hankin, 2008b, p. 47). The underlying assumption among all theories is that risk stems from how individuals interpret and respond to negative events (Segal & Dobson, 1992).

Cognitive models are primarily diathesis-stress models that suggest depression results from an “interaction between an individual’s cognitive vulnerability and certain environmental conditions that serve to trigger this diathesis into operation” (Abela & Hankin, 2008b, p. 36).

Some specific cognitive factors that predict the development of depression include (a) inferential style about causes and consequences (negative events happen because of global and stable causes); (b) dysfunctional attitudes about the self, world, and future (negative thoughts about self, “I’m a bad person,” all or nothing thinking, black and white thinking); and (c) response style (rumination vs. distraction; Abela & Hankin, 2008b). Research consistently finds depressed individuals exhibit more “negative, biased self-referent information processing” (Segal & Dobson, 1992, p. 221).

Adult cognitive models of depression have been widely used to explain depression in children without significant empirical support to demonstrate the appropriateness of the model. Critics argue that children’s cognitive styles are still under construction, therefore, applying adult
models fails to acknowledge critical developmental issues (Cole, 1990).

**Cumulative risk.** Since depression is a heterogeneous and multi-determined disorder, risk is better understood to emerge from constellations and accumulations of vulnerability, rather than from discrete characteristics (Cicchetti & Toth, 1998). In one study, 50% of children who grew up in families with three risk factors (i.e., number of childhood psychiatric diagnoses, duration of family depression, and number of parental nonaffective diagnoses) exhibited depressive symptoms compared to only 7% of the children in families with less than three risk factors (Beardslee & Gladstone, 2001). Depression arises from the cumulative impact of exposure to many risk factors as well as stressful life events (Lewinsohn et al. 1994).

**Consequences of Depression in Childhood**

The presence of depressive symptoms in childhood is a robust predictor of future major depression (Gladstone & Beardslee, 2009; Kovacs & Lopez-Duran, 2010). One study found that for every one-point increase on a self-report depression measure, completed in first grade, there was a fourfold increase in risk of experiencing major depressive disorder in seventh or eighth grade (Ialongo et al., 2001 as cited in Kovacs & Lopez-Duran, 2010). Keenan et al. (2008; as cited in Kovacs & Lopez-Duran, 2010) replicated these findings with nine-year-old girls, and found that their risk of further depression increased two-fold for each depressive symptom reported in a clinical interview. These findings speak to the continuity of depression and the chronic and debilitating course early-onset depression has on the lives of those afflicted.

Formerly depressed adolescents continued to look like depressed individuals long after the episode remits, exhibiting poor coping skills, internalizing behaviors, low self-esteem, pessimism, and self-consciousness (Lewinsohn et al., 1994). Depressed children exhibit many skill deficits and struggle to establish peer relationships and meet academic expectations.
(Cicchetti & Toth, 1998). In addition, depressed children are at greater risk for developing other comorbid conditions (i.e., dysthymic disorder, anxiety, substance abuse, and disruptive behavior disorder) that further impair their functioning (Cicchetti & Toth, 1998). In fact, children with a dual diagnosis are at greater risk for suicide attempts and they are less responsive to treatment (Cicchetti & Toth, 1998). Overall, depression interferes with children’s ability to function competently and significantly challenges normal development (Cicchetti & Toth, 1998).

**Cole’s Work**

David A. Cole has contributed significantly to our understanding of depression in childhood. It is well accepted that cognitive factors place adults at risk for depression (Abela & Hankin, 2008b), but, adult models fail to discuss the origins of a cognitive diathesis and simply point to vague experiences in childhood (Cole et al., 1996). Since various cognitive capacities (i.e., self-concept, capacity for future oriented thinking, understanding of causality, and ability to sequence events) develop with age, Cole proposed that cognitive vulnerability would be different in relation to developmental stage (Abela & Hankin, 2008b; Cole, 1990). From this perspective, Cole’s theoretical and empirical work sought to provide a developmentally sensitive explanation of depression in children. The competence-based model of depression emerged from this research and points to competence as an early indicator of a child’s vulnerability to experiencing depression in their lifetime (Cole, 1991).

**Competence-based theory of depression in childhood.** Based on empirical support, Cole proposed a developmentally sensitive cognitive model to explain depression in children. First, he posited that the self-perception of incompetence is central to all cognitive models of depression. Second, he agreed that children’s self-perceptions are still under development, so they cannot function a stable diathesis, like adult models propose. Third, he proposed that
children’s self-perceptions are more sensitive to influence by their immediate experiences rather than internal structures. Based on this logic, Cole hypothesized that feedback for one’s competence will have a particularly strong influence on children’s thoughts, cognitive structures, and vulnerability to depression.

According to Cole’s model, competence feedback is the foundation for the development of self-perceptions. Since self-perceptions (i.e., self-esteem, self-concept) are inversely related to depression (Neiss, Sedikides, & Stevenson, 2002), they function as an integral component in children’s vulnerability to depression. Children who perceive themselves as lacking or deficient in competence are more vulnerable to experiencing depressive symptoms, than children who perceive themselves as competent in at least one domain (Cole, 1990).

Children who receive both positive and negative feedback, across multiple domains develop a complex, positive self-concept. These children are able to blend their beliefs about their competence in many domains into one stable perception of self (Wigfield et al., 1997). When confronted with failure, children with complex self-concepts are able to access positive self-schemas, this enables them to accept that failure or lack of competence in some areas is only indicative of a small aspect of their overall ability. In contrast, children who consistently receive negative feedback, across multiple domains, develop undifferentiated, negative self-concepts. These children tend to view failure in one domain as a general statement about their ability. They are prone to overgeneralize failure, employ all-or-nothing reasoning (“I am bad at math, so I am a bad at everything”), and engage in negative self-appraisals. The end result for these children is often dysphoria and the onset of depression.

The successful development of a positive self-concept does not require outstanding achievement and competence across all domains. Rather, healthy development requires “good
adaptation” and the development of competence in some domains (Masten & Coatsworth, 1998). Competence is often defined as one’s ability or success at meeting achievement demands (Harter, 1985). Harter put forth that children evaluate their successes and failures in five broad domains: cognitive, social, and athletic competence and appearance and conduct and compile these self-judgments into an overall feeling about the self. Others’ perceptions of one’s competence are essential in this process, too. Cole (1991) posits that others’ appraisals are translated into feedback and shared with the individual. The individual internalizes these messages and creates a self-perception.

Based on this theory, Cole suggests that competence defined as ability or performance will not be as closely linked to depression as competence defined as feedback for performance (Cole, 1990). Thus, according to the competence-based model, the pathway to depression is as follows: (a) children strive to develop competence in multiple domains, (b) children receive feedback from many informants about their success or failure at developing competence, (c) children internalize the feedback into a perception of self, (d) when children receive only negative feedback they fail to develop complex, positive self-schemata and as a result develop a depressogenic cognitive style which makes them vulnerable to experiencing depression (Cole, 1991).

**Cole’s research on depression in childhood.** Cole and his colleagues embarked on research to test the empirical validity of the competence-based model of depression in children. Their findings consistently support links between competence and future depression (see Cole, 1990, 1991; Cole et al., 1996; Cole, Martin et al., 1997). A major strength of Cole and his colleague’s research is their attention to methodological issues. Their studies include large samples of community-based children, and utilize multiple measures to obtain information from
multiple informants across various domains. Significant efforts were made to minimize shared method variance and acknowledge the multivariate structure of the data, and the result is a large body of support for the competence-based model of depression in childhood.

Major findings of these studies suggest (a) competence in social and academic domains is negatively related to depression, (b) competence and incompetence in multiple domains has a cumulative effect on depression, (c) multiple domains of competence reduces the probability of depression, (d) multiple domains of incompetence increases the probability of depression, and (e) incompetence is more highly related to depression than competence is related to depression (Cole, 1990, 1991; Cole et al., 1996). A more detailed review of these findings follows.

Cole (1990) first tested his competence-based model of depression in children with a sample of 750 fourth grade students. He concluded that a substantial amount of variance in depressive symptoms can be accounted for by social and academic competence ratings. Depression correlated strongly with social competence (r = .82) and academic competence (r = .80; Cole, 1990). Children were categorized as competent or incompetent if they scored one standard deviation above or below the mean, respectively. Children rated as socially or academically incompetent by peers and teachers had higher depression scores than students rated competent. Further, children rated as doubly incompetent (low ratings in both social and academic domains) were more depressed than students rated incompetent in only one domain. This study was not longitudinal so causal inferences could not be confirmed.

A second study in extended Cole’s initial research to include five domains (academic, social, physical attractiveness, conduct, and sports) of competence and a larger sample of 1,422 third and fourth graders (Cole, 1991). However, only one self-report measure was used to assess depression and only peer nominations were used to assess the five domains of competence. Four
basic findings emerged from this study: (a) support for the competence-based model of child depression, (b) self-report depression scores were negatively correlated to peer nominated competence, (c) gender played a role in the relationship between competence and depression, and, (d) competence and incompetence contributed differently to the relations between competence and depression. Cole deemed participants competent or incompetent if peers rated them in the top ten percent or bottom ten percent in a particular domain, respectively. For girls, incompetence in four domains (academic, social, conduct, and sports) was more strongly related to depression than peer perceptions of competence. For boys, in contrast, the relationship was linear and a higher level of peer rated competence related to lower level of self-report depression. Interestingly, for girls, physical attractiveness was related to depression at both ends of the continuum. Whereas, for boys, only perceived unattractiveness was related to depression (Cole, 1991). This study highlighted the power of incompetence, more so than competence, to predict depression, especially for girls.

A third study addressed some limitations of earlier studies by including data from multiple measures and multiple informants (parents, teachers, and self-report; Cole et al., 1996). A major finding was that depressive symptoms at Wave 1 did not predict social or academic competence at Wave 2 (6 months later), but low levels of social and/or academic competence at Wave 1 did predict higher levels of depressive symptoms Wave 2. In other words, this study showed that social skill deficits put children at risk for depression, and failed to find support for the hypothesis that depression causes deficits in competence. The authors noted some limitations to this study: the results of this study were only significant for 6th grade students, but not for third graders, and academic competence did not predict changes in depression in the same way social competence did.
Cole and his colleagues have amassed considerable support for the competency-based model of depression in childhood. However, the authors also outline a number of limitations to their research: studies are cross-sectional but the theoretical model being tested is causal, participants are limited to third through sixth grade, and not all domains of competence are examined. They urge longitudinal research to further clarify the relationship between competence and depression across development.

**Replication and Extension of Cole’s Research**

Early-onset depression can follow a chronic and debilitating pathway that compromises children’s levels of functioning and development. The consequences of experiencing depression in childhood are often long lasting and can predict mood disorders in adulthood. Much of the knowledge of depression in children has been inferred from studies with adults. Developmentally sensitive research examining early childhood markers of a maladaptive trajectory towards psychopathology may inform early and effective intervention to prevent the development, onset, and chronic course of early-onset depression. Cole’s research indicates that competence deficits put children at risk for later depression (Cole et al., 1996). Cole (1991) utilized Susan Harter’s work on the dimensions of competence to guide his selection of salient domains. Harter identified five distinct domains in which children and adolescents strive to develop competence: (a) perceived physical appearance, (b) peer likability, (c) athletic competence, (d) scholastic competence, and (e) behavioral conduct (Harter & Whitesell, 1996). Children evaluate their adequacy in these domains, and these self-perceptions are believed to influence overall self-concept and future outcomes (Harter, 1985). Cole and his colleagues’ research focused primarily on two of these domains: social and academic competence. Cole (1990, 1991) found that social competence was a strong predictor of later depression, whereas academic competence was not as
While conduct-related problems are most frequently conceptualized as externalizing problems and used as an outcome variable in the research, they can also be understood as a domain of competence and a predictor of psychopathology. Children have opinions about their conduct based on how well they do the right thing, behave the way they are supposed to, and avoid getting in to trouble (Harter, 1985). The evidence shows that perceptions of personal deficiencies contribute to depressive reactions among adolescents (Harter, 1985). More research is needed to investigate the relations between several domains of competence and depression among younger children, across more domains.

First grade is an ideal time to identify children at high risk for depression for four key reasons. First, it is a time of great transition and “transitions often tax the organizational capacities of the child and, in doing so, maximize individual variation and predictive relationships over time” (Sroufe, Egeland, Carlson, & Collins, 2005, p. 166). Second, there is evidence to show that episodes of depression early in childhood are more common than previously thought, and can persist into adulthood (Nolen-Hoeksema et al., 1992). Third, children’s cognitive styles are in the process of forming in first grade, which makes them more vulnerable to the effects of depression, but also means that this is a good opportunity for intervention to shapes more adaptive cognitive processing. Fourth, first grade is when children enter formal schooling, which is an environment where they can be screened, identified as high-risk, and offered intervention. Early interventions that support the child before the problems become entrenched have the greatest chance of changing the child’s developmental trajectory.

This study replicated and extended Cole’s examination of the association between competence and depression to understand the relations between these domains among younger
children over a longer span of time. Specifically, this study modeled the causal relationships between three domains of competence (social, academic, and behavioral) and depression across three intervals of time (first to fifth grade, fifth to ninth grade, and first to ninth grade). The results provided support for Cole’s competence-based theory of depression, and identified markers of vulnerability to depression that can be identified as early as first grade.
Method

Participants

Data collected from the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD) was used in this study. Participants were recruited from ten sites across the United States. In 1991, families were recruited from hospitals in Arkansas, California, Kansas, Massachusetts, North Carolina, Pennsylvania, Virginia, Washington, and Wisconsin immediately following the birth of a child.

Participants were identified in hospitals during selected 24-hour periods. Researchers screened women who had given birth to a single child for eligibility and willingness to participate in the study. The eligibility criteria included: (a) mothers over 18-years of age, (b) English speaker, (c) healthy mother, (d) single birth, (e) infant not up for adoption, (f) mother’s residence within one hour of research site, (g) no relocation planned for one year, and (h) neighborhood deemed not too dangerous to visit, by police report.

During the sampling period, 8,986 mothers gave birth, 5,416 mothers met the eligibility criteria and agreed to be contacted in two weeks, and 3,015 were randomly selected, from those eligible, to receive a phone call in two weeks. Families were excluded from the participants list if they could not be contacted within three attempts. From the families contacted, 1,525 were eligible for the study and agreed to participate in an interview when the infant was one month old. Of these eligible families, 1,364 participated in the first interview and became study participants.

Study participants came from diverse ethnic, demographic, and economic backgrounds though they averaged higher income, higher education, and were less likely to be of minority race or ethnicity than the general population (NICHD ECCRN, 1997). Participant families
included 13% African American, 6% Hispanic, and 5% Asian, Native American or other ethnicities. Further, 11% of mothers did not complete high school, and 14% were single mothers. Finally, the average family income was three times the poverty threshold.

There were some notable differences between families who remained enrolled in the study throughout, and those who dropped out along the course of the study. A report published by NICHD ECCRN (2006) found that attrited families were more likely than the participating families to be headed by a single parent, to be African American, and to have less income. Further, the mothers in the attrited families presented with more depressive symptoms and had lower parenting scores than the mothers who remained in the study (NICHD ECCRN, 2006).

Several exclusionary factors likely contributed to these sample characteristics. Families were excluded if (a) the mothers were less than 18-years-old, or did not speak English; (b) the family intended to move in the next year, or lived in neighborhoods deemed by police too dangerous to visit; (c) the infants were part of multiple births, or had obvious developmental disabilities, or remained in the hospital more than seven days; (d) mothers had medical problems, established substance abuse, or intended to have their child adopted; or (e) the family lived more than one hour from the study site. As such, the sample was not nationally representative, but it did include a diverse range of families (NICHD ECCRN, 2004).

**Data Collection**

Participants were followed from birth through ninth grade. Data was collected in four phases, from multiple reporters (study participant, teachers, mothers, fathers, childcare providers) in several settings (home, childcare setting, school, lab). Trained research assistants used a variety of instruments including interviews, checklists, and direct observation to collect data.
Data collected during Phases II (Time 1), III (Time 2), and IV (Time 3) of the SECCYD were used in this study. Phase II of the study was conducted between 1995 and 1999 and included 1,226 children between 54 months and 1st grade; this study used data collected in first grade and referred to this as Time 1. Phase III of the study was conducted between 2000 and 2004 and included 1,073 children between second and sixth grade; this study used data collected in fifth grade and referred to this as Time 2. Phase IV, the final phase, included over 1,000 of the original families and was collected when the participants were 14- and 15-years old. This study used data collected in ninth grade and referred to this as Time 3. Within all three phases, only data pertaining to the child’s level of depression and competence in three domains: social, academic, and behavioral was analyzed for this study.

Measures

Social competence. Social competence was assessed broadly on three instruments. Items included related to the child’s level of cooperation, assertion, acceptance of friends’ ideas for play, ability to take turns, and level of empathy.

Parent report. Parents rated participants using the Social Skills Rating System–Parent Form (SSRS; Gresham & Elliott, 1990). This is a 49-item checklist and parents rated the participants in first and fifth grade during a home visit, providing a broad assessment of the study child’s social development (Gresham & Elliott, 1990). It is a standardized, norm-referenced scale that can be used with preschool, elementary, and secondary students (Gresham & Elliott, 1990). According to Elliott, Gresham, & McCloskey (1988), the SSRS is a reliable and valid rating scale of children’s social behavior. It has been correlated with other measures of social competence including the Child Behavior Checklist (Achenbach, 1991; NICHD, 2010). Items assessed participants’ level of cooperation, assertion, responsibility, and self-control on a 3-point
scale, 0 (never) to 3 (very often). The 30 items on the Social Skills subscale were included in this domain, and a high score indicated more social competence.

**Teacher report.** The Social Skills Rating System–Teacher Form (SSRS; Gresham & Elliott, 1990) was used to measure teacher’s perceptions of social competence. Teachers filled out the checklist in first and fifth grade. The SSRS teacher form correlates with other measures such as the Social Behavior Assessment, the Child Behavior Checklist (CBCL), and the Harter Teacher Rating Scale (NICHD, 2010). Again only items from the Social Skills subscale were included as an indicator of social competence.

**Self-report.** The Loneliness and Social Dissatisfaction Questionnaire for Young Children (Asher, Hymel, & Renshaw, 1984) was used to measure the participants’ perception of their own level of social competence. The study child filled out a self-report checklist during a home visit in first and fifth grade. This measure contains 24 items (16 principle and 8 filler) that the child rated on a 3-point scale. The principle items related to the child’s feelings of loneliness, social adequacy versus inadequacy, peers status, and peer relationships. The SECCYD research team reworded some items on this instrument to better refer to the study child’s experiences in general, not just the school setting. A total score was computed as a mean of the principle items only; filler items were omitted.

**Academic competence.** Participants’ skills in reading, oral language, written language, and math were collected to measure academic competence. Two instruments were used to gather ratings of teachers’ perceptions of competence and participants’ actual academic performance. There was no parent measure of academic competence included in this study.

**Teacher report.** The Academic Rating Scale from the Early Childhood Longitudinal Study (see http://nces.ed.gov/ecl) was used to measure teachers’ perceptions of academic
competence. Teachers rated the child’s academic skills in first and fifth grade using a 5-point rating scale that ranged from “not yet demonstrated” to “proficient.” The Total Skills Score was used as an evaluation of academic competence.

**Participant’s performance.** The Woodcock-Johnson Psycho-Educational Battery (Bracken & McCallum, 1993) was used to measure the study child’s individual academic competence. This is a widely used battery of tests designed to evaluate a child’s cognitive aptitude and achievement. In first grade participants completed these subtests as tests of achievement: (a) Test 22 (Letter-Word Identification), (b) Test 25 (Applied Problems), (c) Test 31 (Word Attack). The standard score from these three subtests was combined to create a composite score representing academic competence. In fifth grade participants completed these subtests: Test 22 (Letter-Word Identification), Test 23 (Passage Comprehension), Test 24 (Calculation), and Test 25 (Applied Problems). In fifth grade Broad Reading and Broad Mathematics scores were also included.

**Behavioral competence.** Behavioral competence was defined as the child’s ability to conform to age appropriate rules and expectations. The Child Behavior Checklist (CBCL; Achenbach, 1991) and the Teacher Report Form (TRF; Achenbach, 1991), widely used standardized instruments, were included in this study. In addition, research staff observed participants in an academic setting. Each measure of behavior yielded higher scores for incompetence, while measures for the other two domains (social and academic) were scored in the direction of competence. In order to maintain clarity concerning the direction of relationships among these variables, the behavioral competence domain will be referred to as behavioral incompetence.

**Parent report.** The CBCL yields a broadband score reflecting all externalizing behavior,
which was used as a parent report indicator of behavioral incompetence for participating youth. Higher scores indicate more incompetence.

**Teacher report.** The total score from the TRF Externalizing Behavior Scale was used to measure teachers’ perceptions of participants’ behavioral incompetence. Again, higher scores indicate more incompetence.

**Direct observation.** The Classroom Observation System (COS-1 and COS-5) was used as a measure of participants’ behavioral incompetence. The COS is an instrument that gathers information about the school, the individual study child, and the classroom. The SECC Steering Committee designed this observation instrument for the SECCYD (see http://www.nichd.nih.gov). Research assistants coded discrete behaviors or conditions on a 30-seconds on, 30-seconds off time sampling. The Study Child Negative/Disruptive scale was used to indicate the child’s observed behavioral incompetence. This score was computed as the sum of four items: Study Child Doesn’t Comply with Request, Study Child Negative with Teacher, Study Child Disruptive with teacher, and Study Child Off-Task (Inappropriate). Once again high scores indicated more behavioral incompetence.

**Depression.** Depression was broadly defined as a mood disturbance and was measured using checklists to determine the presence of symptoms.

**Parent.** The Internalizing Behavior Scale on the CBCL was used to measure parents’ perceptions of participants’ levels of depression in first and fifth grades.

**Teacher.** The Internalizing Behavior Scale on the Teacher Report Form (TRF) was used to measure teachers’ perceptions of participants’ level of depression in first and fifth grades.

**Self-report.** The Children’s Depression Inventory–Short Form (CDI-S; Kovaec, 1992) was used to measure participants’ self-reported level of depression in fifth and ninth grades. The
CDI-S, a 10-item short form, of the Children’s Depression Inventory strongly correlates \( .89 \) with the long form (NICHD, 2010). Participants completed the CDI-S in fifth grade and ninth grade as an indicator of their levels of dysphoric mood, lack of pleasure, and self-esteem. There were ten sets of three statements that participants rated on three levels \( (0 = \text{normative behavior}, 1 = \text{a middle statement}, \text{and} 2 = \text{a depressive symptom}) \). Total scores above 8 for girls and above 10 for boys were considered well above average (NICHD, 2010).

**Planned Analyses**

Simple regression analyses were used to determine if a domain of competence at Time 1 predicted depression at Time 2 and/or Time 3. Figure 1 depicts the pathways tested between three domains of competence and depression, across three time intervals. The independent variables were social competence, academic competence, and behavioral incompetence. A composite score for each domain was calculated from multiple instruments completed by multiple informants (participant, parent, teacher, and research assistant). The dependent variable was depression. At Time 2 the depression domain was a composite score comprised of measures from teachers, parents, and self-report. At Time 3 the depression domain was comprised of a single self-report score. Both the independent and dependent variables were continuous in this study.

Preliminary analysis was conducted to ensure distributions were normal and not highly skewed, as well as for how well scores corresponded with published norms for this age group. Then regression analysis was used to answer the following five research questions.

1. To what extent do appraisals of social competence, academic competence, and behavioral incompetence in (a) first grade predict levels of depression in fifth grade, and (b) in fifth grade predict levels of depression in ninth grade?
2. To what extent does first grade depression predict competence appraisals in (a) first grade and (b) fifth grade?

3. To what extent does social competence, academic competence, or behavioral incompetence in first grade predict self-report depressive symptoms in ninth grade?

4. To what extent are symptoms of depression rated by parents and teachers in first grade likely to persist as self-reported depressive symptoms in ninth grade?

5. To what extent does incompetence in more than one domain place a child at increased risk for experiencing future depressive symptoms?
Figure 1. Conceptual map modeling planned regression analyses to test the relations between depression and three domains of competence.
Results

This study utilized data from the NICHD SECCYD. The primary goal was to test the competence-based model of depression at earlier ages across a longer span of time; findings were fairly consistent with Cole and his colleagues’ previous research and broadly support the theory (Cole, 1991; Cole et al., 1996). Specifically, this study showed that the domains of social competence and behavioral incompetence were significantly related to depression for boys and girls, both concurrently and across time. Academic competence was not a reliable predictor of depression for boys, but it was a weak predictor of girls’ depression. Gender differences emerged in the patterns of relationships between competence and depression.

Preliminary Analyses

This study tested the power of early competence evaluations to predict future levels of depressive symptoms. Data from multiple informants (participant, parent, teacher, and research assistant) on three domains of competence (social, academic, and behavioral) and depression were collected in first grade (Time 1), fifth grade (Time 2), and ninth grade (Time 3) using multiple measures. The first four tables present sample means and standard deviations for each instrument included in this study: Social Skills Rating System (SSRS) parent and teacher versions, and Loneliness and Social Dissatisfaction Questionnaire (Table 1); Academic Rating Scale and Woodcock Johnson (Table 2); Child Behavior Checklist (CBCL), Teacher Report Form (TRF), and Classroom Observation System (COS) (Table 3); and Children’s Depression Inventory—Short Form (CDI-S) (Table 4).

Capitalizing on the multivariate structure of the NICHD SECCYD dataset, composite indices were calculated to represent each domain: social competence, academic competence, behavioral incompetence, and first and fifth grade depression. Z scores of the component parts
were averaged to calculate each composite domain. The composite domains for social and academic competence, and behavioral incompetence yielded positively kurtotic but reasonably symmetric distributions. Tabachnik and Fidell (2007) provide a rationale for assuming that kurtosis does not bias inferential tests with large samples (N > 200), and thus no transformations were deemed necessary for these domains. For all of the analyses to follow, missing data was dealt with via listwise deletion within each analysis. Table 5 presents descriptive statistics for the whole sample, including mean z score, range, and standard deviation by domain.

The primary outcome of interest—ninth grade depression—was not a composite score, but was comprised only of participants’ CDI-S scores. The distribution of this variable was markedly skewed, with the vast majority of the sample clustering at the low end of the distribution. Log transformations were not sufficient to correct this skewness. To address this challenge a two-stage model for analyses was adopted. This model is described in further detail later in this section. First, descriptive statistics for each domain assessed in this study are presented.

**Social competence.** Social competence was measured using the SSRS and the Loneliness and Social Dissatisfaction Questionnaire. The social competence composite was approximately normally distributed, which was expected when using standardized scores. See Table 1 for the sample mean and standard deviation for each instrument within the social competence domain, reported separately by sex and grade.

Parents and teachers rated the study participant on the SSRS, which generated standard scores with a mean of 100 and a standard deviation of 15. The sample mean on the SSRS fell in the normal range for boys and girls. Analysis indicated that parents and teachers rated boys and girls similarly, and perceived participants to have a level of social competence similar to a
Study participants self-reported their perceived level of competence on the Loneliness and Social Dissatisfaction Questionnaire. This instrument contains 24 items measured on a 3-point scale (1 = no, 2 = sometimes, 3 = yes). A total loneliness and social dissatisfaction score was computed as the mean of the 16 principal items. The possible range of values was 16 to 48, with higher values indicating less competence. Thus, to maintain a measure of competence, scores from this instrument were reversed before computing the social competence composite.

Asher and Wheeler’s (1985) study involving third and sixth grade students was used to assist in benchmarking. The authors used the Loneliness and Social Dissatisfaction Questionnaire and reported that popular students had a mean score of 25.36 (SD 5.81), and rejected students had a mean score of 37.97 (SD 16.07; Asher & Wheeler, 1985). The sample
mean for boys and girls in this study ranged from 23.1 to 26.3 at both test intervals (first and fifth grade), which was similar to the scores of “popular” students in this other study.

**Academic Competence.** Teachers and study participants assessed academic competence on two instruments: Academic Rating Scale from the Early Childhood Longitudinal Study and Woodcock-Johnson Psycho-Educational Battery. The distribution of scores for the academic competence composite appeared approximately normal. Mean scores and standard deviations for each instrument included in this composite are displayed in Table 2. Teachers rated participants’ academic competence on a five-point scale: 1 (not yet demonstrated), 2 (beginning), 3 (in progress), 4 (intermediate), and 5 (proficient). A Total Academic Skills score was computed as the mean of all 25 items on the instrument. The possible range of scores was 1 to 5, with higher values indicating more competence. Participants’ scores from our sample ranged from 1.04 to 5, with a mean of 3.28 (SD .90). Thus, the average study participant was perceived to have “demonstrated skill, knowledge, or behavior with some regularity but varies in level of competence” (from Academic Rating Scale from the Early Childhood Longitudinal Study).

Study participants completed select subtests from the Woodcock Johnson Psycho-Educational Battery, which differed by grade (see Table 2 for subtests). A standard score was computed for each subtest, which has a mean of 100 and a standard deviation of 15. For each subtest the sample mean fell within the normal range.

**Behavioral incompetence.** Parents, teachers, and research assistants assessed level of behavioral incompetence using three instruments: CBCL, TRF, and COS. Higher scores on these measures are indicative of incompetence, rather than competence, so the expected direction of correlations with depression was positive. The composite domain, comprised of standardized
Table 2

Sample Means and Standard Deviations for Indicators of Academic Competence

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Boys Mean</th>
<th>Boys SD</th>
<th>Boys Range</th>
<th>Boys n</th>
<th>Girls Mean</th>
<th>Girls SD</th>
<th>Girls Range</th>
<th>Girls n</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Rating Scale – Teacher</td>
<td>3.3</td>
<td>0.9</td>
<td>1.2-5</td>
<td>524</td>
<td>3.3</td>
<td>0.9</td>
<td>1.04-5</td>
<td>480</td>
</tr>
<tr>
<td>Woodcock Johnson Subtests</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Problems</td>
<td>111.7</td>
<td>17.9</td>
<td>53-163</td>
<td>511</td>
<td>109.9</td>
<td>16.3</td>
<td>46-154</td>
<td>512</td>
</tr>
<tr>
<td>Letter-Word Ident.</td>
<td>110.5</td>
<td>16.5</td>
<td>51-152</td>
<td>513</td>
<td>113.5</td>
<td>14.9</td>
<td>71-154</td>
<td>512</td>
</tr>
<tr>
<td>Word Attack</td>
<td>108.1</td>
<td>15.0</td>
<td>77-143</td>
<td>512</td>
<td>108.7</td>
<td>13.7</td>
<td>76-145</td>
<td>512</td>
</tr>
<tr>
<td><strong>Fifth Grade</strong></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Academic Rating Scale – Teacher</td>
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<td>0.9</td>
<td>1-5</td>
<td>449</td>
<td>3.4</td>
<td>0.8</td>
<td>1.04-5</td>
<td>416</td>
</tr>
<tr>
<td>Woodcock Johnson Subtests</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Problems</td>
<td>109.7</td>
<td>14.3</td>
<td>37-156</td>
<td>496</td>
<td>109.0</td>
<td>12.8</td>
<td>52-155</td>
<td>497</td>
</tr>
<tr>
<td>Letter-Word Ident.</td>
<td>108.1</td>
<td>15.0</td>
<td>36-154</td>
<td>496</td>
<td>108.6</td>
<td>14.0</td>
<td>40-154</td>
<td>497</td>
</tr>
<tr>
<td>Broad Math</td>
<td>110.4</td>
<td>18.5</td>
<td>8-177</td>
<td>496</td>
<td>110.9</td>
<td>16.2</td>
<td>15-173</td>
<td>497</td>
</tr>
<tr>
<td>Broad Reading</td>
<td>107.4</td>
<td>14.1</td>
<td>31-154</td>
<td>496</td>
<td>108.4</td>
<td>13.7</td>
<td>30-152</td>
<td>497</td>
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<tr>
<td>Calculation</td>
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<td>17.9</td>
<td>12-170</td>
<td>496</td>
<td>109.6</td>
<td>14.9</td>
<td>58-164</td>
<td>495</td>
</tr>
<tr>
<td>Passage Comprehension</td>
<td>104.6</td>
<td>12.2</td>
<td>37-140</td>
<td>494</td>
<td>106.2</td>
<td>12.4</td>
<td>29-151</td>
<td>497</td>
</tr>
<tr>
<td>Picture Vocabulary</td>
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<td>14.3</td>
<td>29-146</td>
<td>495</td>
<td>102.7</td>
<td>15.3</td>
<td>35-155</td>
<td>497</td>
</tr>
</tbody>
</table>

*Note: WJ STD Score have a M = 100, SD = 15*

scores from each instrument within this domain, was approximately normally distributed.

The sample mean and standard deviations for each instrument within this domain are presented in Table 3. The sample mean T scores from the Externalizing Subscale of the CBCL and TRF for boys and girls fell within the normal range at each grade level included in this study. Research assistants rated study participants classroom behavior on the COS in a 30-seconds-on, 30-seconds-off timing-sampling method; discrete behaviors were rated on a 7-point scale (1 = uncharacteristic, 3 = minimally characteristic, 5 = very characteristic, 7 = extremely characteristic). Standard psychometric analysis for the COS, detailed in the SECCYD’s documentation (see http://www.nichd.nih.gov), indicated the raw items had low
Table 3

*Sample Means and Standard Deviations for Indicators of Behavioral Incompetence*

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Boys</th>
<th></th>
<th></th>
<th></th>
<th>Girls</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
<td>n</td>
</tr>
<tr>
<td>CBCL-Externalizing T-Score</td>
<td>48.3</td>
<td>9.8</td>
<td>30-77</td>
<td>515</td>
<td>49.0</td>
<td>9.8</td>
<td>32-83</td>
<td>513</td>
</tr>
<tr>
<td>TRF-Externalizing T-Score</td>
<td>51.1</td>
<td>8.8</td>
<td>39-84</td>
<td>526</td>
<td>50.2</td>
<td>8.6</td>
<td>39-79</td>
<td>482</td>
</tr>
<tr>
<td>Classroom Observation System</td>
<td>2.2</td>
<td>3.9</td>
<td>0-29</td>
<td>489</td>
<td>1.2</td>
<td>2.4</td>
<td>0-21</td>
<td>477</td>
</tr>
<tr>
<td>CBCL-Externalizing T-Score</td>
<td>45.4</td>
<td>9.9</td>
<td>30-78</td>
<td>505</td>
<td>46.2</td>
<td>10.3</td>
<td>32-77</td>
<td>512</td>
</tr>
<tr>
<td>TRF-Externalizing T-Score</td>
<td>50.5</td>
<td>8.9</td>
<td>39-85</td>
<td>448</td>
<td>51.3</td>
<td>9.3</td>
<td>39-88</td>
<td>406</td>
</tr>
<tr>
<td>Classroom Observation System</td>
<td>0.5</td>
<td>1.9</td>
<td>0-20.3</td>
<td>476</td>
<td>0.2</td>
<td>1.2</td>
<td>0-17.3</td>
<td>479</td>
</tr>
</tbody>
</table>

Internal reliability (standardized Cronbach’s alpha = .29), and scores had high levels of skewness and kurtosis. Therefore, this measure was not very sensitive at identifying differences among study participants’ behavior; most of the scores fell within a large normal range and differences among study participants were only identified when the behaviors were extreme. The study participants’ scores had a mean of 1.68 (SD 3.27). Most participants received a rating of “one” (uncharacteristic) on all items (Study Child Doesn’t Comply with Request, Study Child Negative with Teacher, Study Child Disruptive with teacher, and Study Child Off-Task or Inappropriate).

**Depression.** Parents, teachers, and participants assessed depressive symptoms using three measures: CBCL, TRF, and CDI-S. Only the Internalizing Scale, on the CBCL and TRF, was included as a measure of depression. Table 4 presents the mean, range, and standard deviation for each instrument used in the depression domain, separately for each grade level. Parents’ and teachers’ ratings indicated that others perceived this population to have similar levels of depressive symptoms to that of a normative comparison sample of same age peers. The distributions of scores within the first and fifth grade depression composites were approximately normal.
Table 4

*Sample Means and Standard Deviations for Indicators of Depression*

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>First Grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBCL - Internalizing (T-Score)</td>
<td>48.3</td>
<td>9.4</td>
</tr>
<tr>
<td>TRF - Internalizing (T-Score)</td>
<td>49.3</td>
<td>9.1</td>
</tr>
<tr>
<td><strong>Fifth Grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBCL - Internalizing (T-Score)</td>
<td>48.8</td>
<td>10.1</td>
</tr>
<tr>
<td>TRF - Internalizing (T-Score)</td>
<td>49.9</td>
<td>9.4</td>
</tr>
<tr>
<td>CDI-S</td>
<td>1.2</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Ninth Grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDI-S</td>
<td>1.5</td>
<td>2.1</td>
</tr>
</tbody>
</table>

In ninth grade, the sole indicator of depression was the self-reported CDI-S, and scores were significantly positively skewed. Figure 2 presents two frequency histograms showing the whole samples’ CDI-S scores in ninth grade, separately by sex. One third of the sample endorsed zero symptoms of depression in ninth grade. The possible range of scores on the CDI-S was zero to 20, with actual scores ranging from zero to 12 for boys, and from zero to 18 for girls. Kovacs, the author of the CDI-S, does not suggest a cut-off score to identify clinical cases of depression; however, scores of ten and higher for boys and eight and higher for girls are considered well above average (Houghton Cowley, Houghton, & Kelleher, 2003; NICHD, 2010). Using this cut-off level, 1% of boys and almost 8% of girls in the sample fell in the clinically significant range for depression, and 47% of boys and 31% of girls reported no symptoms of depression at all in the two-weeks leading up to data collection in ninth grade. As expected, girls exhibited higher levels of depressive symptoms on the CDI-S.
Figure 2. Frequency of ninth grade CDI-S scores for whole sample, by sex.
Two-Stage Model of Analyses

To address the skewness of our outcome variable (ninth grade depression) a two-stage model for analyses was adopted. Many participants self-reported zero symptoms of depression on the CDI-S in ninth grade, a finding not uncommon in a nonclinical sample (Houghton et al., 2003). These zeros were interpreted to mean the absence of a problem for which severity could be rated (i.e., the participant did not experience any symptoms of depression in the past two weeks). Delucchi and Bostrom (2004) suggest that this sort of distribution reflects two simultaneous processes, which are better treated with a two-stage model for analysis, as described below.

**Stage-one analyses.** Using the whole sample, a discriminant function analysis was conducted to determine whether competence levels could predict membership in two mutually exclusive groups: participants who did not endorse any symptoms of depression (CDI = 0), and participants who endorsed any depressive symptoms (CDI > 0.1). The computation did not yield any relationship strong enough to exceed the threshold set for inclusion in the discriminant function. In other words, participants’ level of competence in first grade did not predict their membership in a depression group in ninth grade. Table 5 presents descriptive statistics by domain, and grade for the whole sample.

**Stage-Two analyses.** Stage-two analyses modeled the relations between competence and depression across several intervals for a smaller subsample of more depressed participants. Regression analyses were run to determine the path coefficients between depression and three domains of competence. Figure 3 presents the conceptual map for the analyses in this study and includes significant path coefficients between domains. Only participants with CDI-S scores above zero in ninth grade were included in stage-two analyses. As such, the sample size
Table 5

Descriptive Statistics for the Whole Sample by Domain (Z Scores)

<table>
<thead>
<tr>
<th>Domain</th>
<th>n</th>
<th>Mean</th>
<th>Range</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>First Grade</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>1271</td>
<td>.003</td>
<td>-2.6 to 2.2</td>
<td>.68</td>
</tr>
<tr>
<td>Academic</td>
<td>1276</td>
<td>.01</td>
<td>-2.7 to 2.3</td>
<td>.79</td>
</tr>
<tr>
<td>Behavioral</td>
<td>1279</td>
<td>.01</td>
<td>-1.7 to 5.4</td>
<td>.01</td>
</tr>
<tr>
<td>Depression</td>
<td>1274</td>
<td>.01</td>
<td>-1.7 to 3.8</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fifth Grade</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>1201</td>
<td>-.02</td>
<td>-2.9 to 2.5</td>
<td>.66</td>
</tr>
<tr>
<td>Academic</td>
<td>1216</td>
<td>.01</td>
<td>-4.6 to 2.6</td>
<td>.81</td>
</tr>
<tr>
<td>Behavioral</td>
<td>1237</td>
<td>-.01</td>
<td>-1.4 to 6.1</td>
<td>.73</td>
</tr>
<tr>
<td>Depression</td>
<td>1240</td>
<td>.01</td>
<td>-1.5 to 3.0</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ninth Grade</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>957</td>
<td>.00</td>
<td>-.8 to 6.1</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. Behavioral domain score is an indicator of incompetence.*

was reduced by almost half (from 478 to 254 for boys, and 479 to 328 for girls). Table 6 presents descriptive statistics by domain for this smaller depressed subsample.

Cohen’s (1992) guidelines for small, medium, and large effect sizes were adopted to describe the strength of the relationships found in this study. Regression coefficients were described as weak if between .10 and .29, medium if between .30 and .49, and strong if .50 or greater (Cohen).

**Research question 1: To what extent do appraisals of social competence, academic competence, and behavioral incompetence in (a) first grade predict levels of depression in fifth grade; and (b) in fifth grade predict levels of depression in ninth grade?** Table 7 presents the regression analyses for the relationships between depression and each domain of competence, across the first to fifth grade interval, and the fifth to ninth grade interval, separately by sex. Multiple domains of competence were significantly associated with depression. The social competence domain predicted lower levels of depression and the behavioral incompetence
Figure 3. Conceptual Map showing significant (p < .05) path coefficients between competence and depression, in **bold font** for boys and regular font for girls; ns = not significant.
Table 6

Descriptive Statistics for Depressed Subsample by Domain, Separately for Boys and Girls (Z Scores)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Boys</th>
<th></th>
<th></th>
<th>Girls</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>Range</td>
<td>SD</td>
<td>n</td>
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</tr>
<tr>
<td>First Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>247</td>
<td>.01</td>
<td>-2.01 to 1.96</td>
<td>.67</td>
<td>327</td>
<td>-.003</td>
</tr>
<tr>
<td>Academic</td>
<td>247</td>
<td>-.03</td>
<td>-2.33 to 1.80</td>
<td>.82</td>
<td>327</td>
<td>.02</td>
</tr>
<tr>
<td>Behavioral</td>
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<td>-1.62 to 4.50</td>
<td>.78</td>
<td>327</td>
<td>-.04</td>
</tr>
<tr>
<td>Depression</td>
<td>247</td>
<td>.08</td>
<td>-1.60 to 3.10</td>
<td>.88</td>
<td>326</td>
<td>.02</td>
</tr>
<tr>
<td>Fifth Grade</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>251</td>
<td>-.11</td>
<td>-2.03 to 1.28</td>
<td>.74</td>
<td>327</td>
<td>.001</td>
</tr>
<tr>
<td>Academic</td>
<td>250</td>
<td>.002</td>
<td>-2.99 to 2.64</td>
<td>.82</td>
<td>326</td>
<td>.04</td>
</tr>
<tr>
<td>Behavioral</td>
<td>253</td>
<td>.01</td>
<td>-1.27 to 3.78</td>
<td>.64</td>
<td>328</td>
<td>.00</td>
</tr>
<tr>
<td>Depression</td>
<td>253</td>
<td>.08</td>
<td>-1.51 to 2.71</td>
<td>.71</td>
<td>327</td>
<td>.08</td>
</tr>
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<td>Ninth Grade</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>254</td>
<td>.30</td>
<td>-.38 to 3.79</td>
<td>.82</td>
<td>328</td>
<td>.64</td>
</tr>
</tbody>
</table>

Note. Behavioral domain score is an indicator of incompetence.

domain predicted higher levels of depression for both boys and girls. Academic competence predicted lower levels of depression for girls, but not boys.

**Boys.** First grade social competence accounted for 2% of the variance in fifth grade depression, $F(1, 244) = 4.97, p = .03$. Similarly, fifth grade social competence accounted for 2% of the variance in ninth grade depression, $F(1, 249) = 4.53, p = .03$. Behavioral incompetence was also a weak but significant predictor of depression between first and fifth grade, $F(1, 245) = 7.10, p = .01$, but not between fifth and ninth grade.

**Girls.** All three domains of first grade competence predicted fifth grade depression, and all three domains of fifth grade competence predicted ninth grade depression. First grade social competence accounted for 2% of the variance in fifth grade depression, $F(1, 324) = 10.96, p = .001$. Fifth grade social competence accounted for 8% of the variance in ninth grade depression,
$F(1, 325) = 26.87, p = .001.$

Academic competence was also a weak predictor of girls’ depression. First grade academic competence accounted for 1% of the variance in fifth grade depression, $F(1, 324) = 4.10, p = .04$, and fifth grade academic competence accounted for 1% of the variance in ninth grade depression, $F(1, 325) = 26.87, p = .001$. A positive regression coefficient was generated between fifth and ninth grade, which indicated that greater academic competence predicted more depressive symptoms. This result was contrary to our hypothesis and the competence-based theory of depression.

The behavioral incompetence domain was an indicator of incompetence, and showed weak to moderate relations with depression for girls. First grade behavioral incompetence accounted for 8% of the variance in fifth grade depression, $F(1, 324) = 26.83, p = .001$, and fifth grade behavioral incompetence accounted for 1% of the variance in ninth grade depression, $F(1, 324) = 4.21, p = .04$.

**Research question 2:** To what extent does first grade depression predict competence appraisals in (a) first grade and (b) fifth grade? Table 8 presents the results of each regression analyses, separately by sex, across two time intervals. Results were consistent for boys and girls, and showed that first grade depression predicted social and behavioral incompetence across both time intervals; but early depression did not predict academic competence.

**Boys.** First grade depression covaried moderately with first grade social competence, $F(1, 245) = 27.54, p = .001$, and accounted for 6% of the variance in fifth grade social competence, $F(1, 242) = 14.64, p = .001$. First grade depression covaried weakly, but significantly, with first grade behavioral incompetence, $F(1, 245) = 10.61, p = .001$, and accounted for 5% of the variance in fifth grade behavioral incompetence, $F(1, 244) = 12.53, p = .001$. 
Table 7

*Regression Analysis: Predicting Depression from Competence*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>b</th>
<th>B</th>
<th>SE(B)</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Grade to Fifth Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social to Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>-.14*</td>
<td>-.14</td>
<td>.06</td>
<td>.02</td>
</tr>
<tr>
<td>Girls</td>
<td>-.18*</td>
<td>-.18</td>
<td>.06</td>
<td>.03</td>
</tr>
<tr>
<td>Academic to Depression</td>
<td></td>
<td></td>
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<td>Boys</td>
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<tr>
<td>Girls</td>
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<td>-.10</td>
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<tr>
<td>Behavioral to Depression</td>
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<tr>
<td>Boys</td>
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<td>.14</td>
<td>.05</td>
<td>.03</td>
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<tr>
<td>Girls</td>
<td>.28*</td>
<td>.31</td>
<td>.06</td>
<td>.08</td>
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<tr>
<td><strong>Fifth Grade to Ninth Grade</strong></td>
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<tr>
<td>Social to Depression</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Boys</td>
<td>-.13*</td>
<td>-.15</td>
<td>.07</td>
<td>.02</td>
</tr>
<tr>
<td>Girls</td>
<td>-.28*</td>
<td>-.46</td>
<td>.09</td>
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<td>Academic to Depression</td>
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<td></td>
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</tr>
<tr>
<td>Boys</td>
<td>.06</td>
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<td>.17</td>
<td>.00</td>
</tr>
<tr>
<td>Girls</td>
<td>.11*</td>
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<td>.21</td>
<td>.01</td>
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<tr>
<td>Behavioral to Depression</td>
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<tr>
<td>Boys</td>
<td>.05</td>
<td>.16</td>
<td>.21</td>
<td>.00</td>
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<tr>
<td>Girls</td>
<td>.12*</td>
<td>.58</td>
<td>.27</td>
<td>.01</td>
</tr>
</tbody>
</table>

*Note.* *p < .05

**Girls.** Similar to boys, girls’ first grade depression predicted first and fifth grade social and behavioral incompetence, but not academic competence. First grade depression covaried weakly with first grade social competence, $F(1, 324) = 22.72, p = .001$, and accounted for 9% of the variance in fifth grade social competence, $F(1, 323) = 32.50, p = .001$. First grade depression covaried moderately with first grade behavioral incompetence, $F(1, 324) = 100.91, p = .001$, and accounted for 8% of the variance in fifth grade behavioral incompetence, $F(324) = 28.65, p = .001$. 
Table 8

*Regression Analysis: Predicting Competence from Depression*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Grade 1 to Grade 1</th>
<th>Grade 1 to Grade 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>B</td>
</tr>
<tr>
<td><strong>Depression to Social</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>-.32*</td>
<td>-.25</td>
</tr>
<tr>
<td>Girls</td>
<td>-.26*</td>
<td>-.29</td>
</tr>
<tr>
<td><strong>Depression to Academic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>-.12</td>
<td>-.11</td>
</tr>
<tr>
<td>Girls</td>
<td>-.08</td>
<td>-.08</td>
</tr>
<tr>
<td><strong>Depression to Behavioral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>.20*</td>
<td>.18</td>
</tr>
<tr>
<td>Girls</td>
<td>.49*</td>
<td>.40</td>
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<tr>
<td><strong>Note.</strong></td>
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</tbody>
</table>

**Research question 3:** To what extent does social competence, academic competence, or behavioral incompetence in first grade predict self-report depressive symptoms in ninth grade? Table 9 presents the results of each regression analyses testing the prediction of ninth grade depression from three domains of first grade competence, separately by sex. Different patterns emerged for boys and girls.

**Boys.** First grade social competence accounted for 2% of the variance in ninth grade depression, $F(1, 245) = 4.23, p = .04$. First grade academic and behavioral incompetence did not predict ninth grade depression.
Table 9

Regression Analysis: Predicting Ninth Grade Depression from First Grade Competence

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter</th>
<th>b</th>
<th>B</th>
<th>SE(B)</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social to Depression</td>
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<td>-.15</td>
<td>.08</td>
<td>.02</td>
</tr>
<tr>
<td>Girls</td>
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<td>-.05</td>
<td>-.09</td>
<td>.09</td>
<td>.00</td>
</tr>
<tr>
<td>Academic to Depression</td>
<td>Boys</td>
<td>-.03</td>
<td>-.08</td>
<td>.16</td>
<td>.00</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td>.04</td>
<td>.15</td>
<td>.22</td>
<td>.00</td>
</tr>
<tr>
<td>Behavioral to Depression</td>
<td>Boys</td>
<td>-.02</td>
<td>-.04</td>
<td>.17</td>
<td>.00</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td>.12*</td>
<td>.58</td>
<td>.27</td>
<td>.01</td>
</tr>
</tbody>
</table>

Note. *p < .05

**Girls.** First grade behavioral incompetence accounted for 1% of the variance in ninth grade depression, \( F(1, 325) = 4.78, p = .03 \). First grade social and academic competence did not predict ninth grade depression.

**Research question 4: To what extent are symptoms of depression rated by parents and teachers in first grade likely to persist as self-reported depressive symptoms in ninth grade?** Table 10 presents the results of the regression analyses testing the relations between early depressive symptoms and future depressive symptoms, separately by sex. Prior depression levels predicted future depression levels across all intervals consistently for boys and girls. There was a moderate relationship between first grade and fifth grade depression, for both boys and girls; across other intervals the relationships were predominantly weak.

**Boys.** First grade depression accounted for 16% of the variance in fifth grade depression, \( F(1, 244) = 44.98, p = .001 \), a significant, moderate relationship. Fifth grade depression accounted for 2% of the variance in ninth grade depression, \( F(1, 251) = 5.60, p = .02 \), a significant but weak relationship. Finally, first grade depression accounted for 2% of the
Table 10

*Regression Analysis: Predicting Future Depression from Early Depression*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>b</th>
<th>B</th>
<th>SE(B)</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1 to Grade 5</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>.40*</td>
<td>.30</td>
<td>.04</td>
<td>.16</td>
</tr>
<tr>
<td>Girls</td>
<td>.40*</td>
<td>.36</td>
<td>.05</td>
<td>.16</td>
</tr>
<tr>
<td>Grade 1 to Grade 9</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>.13*</td>
<td>.32</td>
<td>.15</td>
<td>.02</td>
</tr>
<tr>
<td>Girls</td>
<td>.19*</td>
<td>.74</td>
<td>.22</td>
<td>.04</td>
</tr>
<tr>
<td>Grade 5 to Grade 9</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>.15*</td>
<td>.45</td>
<td>.19</td>
<td>.02</td>
</tr>
<tr>
<td>Girls</td>
<td>.31*</td>
<td>1.35</td>
<td>.23</td>
<td>.10</td>
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</tbody>
</table>

*Note. *p < .05

variance in ninth grade depression, $F(1, 245) = 4.39, p = .04$, also a significant, though weak relationship.

*Girls*. First grade depression accounted for 16% of the variance in fifth grade depression, $F(1, 323) = 59.79, p = .001$, a significant, moderate relationship. Fifth grade depression accounted for 10% of the variance in ninth grade depression, $F(1, 325) = 35.16, p = .001$, also a moderate relationship. Finally, fifth grade depression accounted for 4% of the variance in ninth grade depression, $F(1, 324) = 11.69, p = .001$, a significant, weak relationship.

*Research question 5: To what extent does incompetence in more than one domain place a child at increased risk for experiencing future depressive symptoms?* Using Cole et al.’s (1996) cutoff for identifying incompetence, a participant was classified as incompetent in a domain when his or her composite score was at or below the 10th percentile for the sample in that domain. Table 11 presents the mean ninth grade depression scores (CDI-S) by number of domains in which participants fell within the incompetent range. From a total of 582 participants, 465 exhibited no areas of incompetence, 103 participants had one area of incompetence, 14
Table 11

*Ninth Grade Depression as a Function of Number of Domains of First Grade Incompetence*

<table>
<thead>
<tr>
<th>Number of Domains of Incompetence</th>
<th>CDI-S</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>0</td>
<td>3.37</td>
<td>2.63</td>
</tr>
<tr>
<td>1</td>
<td>2.95</td>
<td>2.9</td>
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<tr>
<td>2</td>
<td>3.29</td>
<td>2.46</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

participants were deemed incompetent in two domains, and zero participants exhibited incompetence in all three domains. No significant correlation was observed between number of domains of incompetence and depression score in ninth grade.
Discussion

The overall aim of this study was to replicate and extend Cole et al.’s (1996) research examining the longitudinal relations between early competence and future depression. The study replicated the methodological strengths of Cole’s research program by using rating scales, observations, and performance measures from multiple informants at several time points, to minimize common method bias and shared method variance (Millsap, 1990). Like Cole and his colleagues, most instruments included in this study had strong psychometric properties. Finally, access to a large, community-based longitudinal sample enabled this study to extend previous findings by including more children across a longer span of time. Specifically this study: (a) tested the competence-based theory of depression with younger children, and (b) clarified the linkages between competence and depression by modeling the relations over an 8-year span.

Cole’s (1990) competence-based theory is a deficit model that links feedback, regarding competence, to depression. Previous research finds considerable support for this theory, however most studies have been cross-sectional and focused only on middle childhood (Cole, 1990, 1991; Cole et al., 1996). This study provided longitudinal evidence for Cole’s theory and showed that children who have difficulty achieving competence in several domains, early in childhood, are at greater risk for developing depressive symptoms early in adolescence.

Three specific findings are worth highlighting. One, in accordance with the competence-based theory, social competence and behavioral incompetence were significant, if weak predictors of future depression in our study. Two, the strongest predictor of future depressive symptoms was prior depressive symptoms, adding to the evidence that early-onset depression tends to be associated with a chronic course (Lewinsohn et al., 1994). Three, transactional relations between competence and depressive symptoms emerged such that early
competence predicted later depression, and the inverse was also true. In contrast, Cole et al. (1996) reported that competence predicted depression 6-months later, but depression did not predict competence 6-months later.

This study failed to find support for two findings previously reported by Cole and his colleagues. Competence in first grade did not predict participants’ membership in a depression group in ninth grade. However, using a more depressed sample in stage-two analyses, significant but relatively weak relationships between competence ratings and degree of depressive symptoms emerged. Secondly, the number of domains in which a participant was deemed incompetent did not predict their level of depression in this study, which is contrary to Cole et al.’s (1996) previous findings that competence has a cumulative effect on depression. The following discussion will elaborate on our findings and discuss implications for the competence-based theory of depression. Suggestions for clinical practice and avenues for future research will also be presented.

**Covariation Between Three Domains of Competence and Depression**

**Social Competence.** Social competence reliably predicted future depressive symptoms for boys and girls, across all intervals in this study. Similar to Cole et al. (1996) and other extant literature, peer difficulties in first grade predicted both concurrent depression and future depression (Blandon, Calkins, Grimm, Keane, & O’Brien, 2010; Blechman et al., 1986; Cole, 1990). Children perceived to have limited ability to cooperate, accept friends’ ideas for play, take turns, and express empathy were more likely to experience depressive symptoms in middle childhood and early adolescence. These types of social problems elicit adult disapproval, and according to the competence-based theory, negative feedback associated with exhibiting skill deficits increases children’s vulnerability to depression (Cole, 1991).
Sex differences in the relations between social competence and depression were noted in this study. While social competence was equally predictive of boys’ and girls’ depression across the shorter 4-year span of early childhood (between first and fifth grade), sex differences across the longer 8-year span, and across the span from fifth to ninth grade emerged. Initially (between first and fifth grade) similar path coefficients were generated for boys and girls. Then, first grade competence only predicted boys’ ninth grade depression. Finally, social competence became more predictive of depression for girls than for boys, across the fifth to ninth grade interval.

Early in childhood, girls and boys place equal emphasis on relationships and being popular (Rose & Rudolph, 2006). Other researchers have also noted that early social problems were more predictive of adolescent boys’ future internalizing problems and less predictive of girls’ future problems (Mesman et al., 2001). This is rather surprising considering the common assumption that relationships are more central to girls’ emotional well-being than boys’ (Rose & Rudolph, 2006). It could be that early social problems in boys are a sign of a difficult temperament, which is a general risk factor that has many consequences for adaptive development. For example, being stubborn, angry, sulky, or demanding is a precursor to a variety of problems in later childhood (Mesman et al., 2001). Then, during puberty and beyond, the centrality of relationships in determining self-esteem escalates for girls, which may explain the sex differences noted in our study (Rose & Rudolph, 2006).

**Academic Competence.** Academic competence emerged as a reliable, yet weak predictor of girls’ depression; it did not predict boys’ depression. Cole’s research has produced inconsistent results for the predictive power of academic competence. Initially, Cole found significant correlations between academic competence and depression (Cole, 1990, 1991). However, further studies in Cole’s research program failed to show that academic competence
predicted depression. In fact, academic competence was only a weak predictor of depression for sixth grade students, and did not emerge as a salient predictor of depression among third grade students (Cole et al., 1996). In this current study, academic competence predicted depression across two time intervals (first to fifth grade and fifth to ninth grade), but only for girls.

Harter (1985) suggested that two processes shape the impact of perceived competence on self-concept and vulnerability: one’s adequacy of performance in a domain, and the relative importance one places on that domain. Not surprisingly, “Boys and girls tend to interpret competence-related information differently, set different standards for self-evaluation, have different expectations about their abilities, and seek out qualitatively different kinds of tasks and feedback from others” (Cole, Maxwell, & Martin, 1997, p. 56). For example, boys differentiate between academic and behavioral feedback, but girls do not (Eccles, Wigfield, Harold, & Blumenfeld, 1993). Girls tend to underestimate their academic abilities and attribute failure to low ability, whereas boys tend to be more optimistic about their academic abilities (Herman, Lambert, Reinke, & Ialongo, 2008). Finally, girls tend to incorporate feedback from informants into one global self-assessment, whereas boys adopt a multifaceted view that allows them to accept both positive and negative self-appraisals simultaneously (Harter, 1985). On top of these sex differences in how feedback is received, there are differences in the way adults provide feedback to boys and girls. “Teachers tend to attribute girls’ failures to internal, stable, trait like causes such as ability, whereas teachers more often attribute boys’ failures to poor effort or lack of motivation” (Cole, Martin, & Powers, 1997, p. 506). Taken together, girls’ self-concept may be particularly influenced by negative academic feedback, which would explain our significant findings for girls but not boys in this domain. Similar to our findings, other researchers also report that academic competence was more predictive of depression for girls versus boys.
Surprisingly, girls with higher academic competence in fifth grade were more likely to experience depression in ninth grade. Even though the effect size was weak, with fifth grade academic competence only predicting 1% of ninth grade depression, this finding is notable because it is counter to the hypothesis outlined in this study and to the competence-based theory. One possible explanation is that academically skilled girls place a lot of emphasis on school performance and set very high expectations for themselves, making this domain particularly salient and predictive of future depression. As such, even seemingly minimal failure or less than exemplary feedback within this domain may be especially influential on “smart” girls’ self-concepts, and subsequent vulnerability to depression.

Behavioral Incompetence. Noncompliance, disruptive behavior, and off-task behavior correlated with depression across the 4-year interval for boys and girls, and across the 8-year interval for girls only. A primary task of childhood is developing a capacity for rule-governed behavior, and failure to establish conduct related competence has cascading effects into other domains of functioning (Mazza et al. 2009; Obradovic, Burt, & Masten, 2010). Early conduct problems set off a series of failure experiences (Patterson & Stoolmiller, 1991), which interfere with children’s ability to successfully accomplish other developmental tasks such as making friends, learning social skills, and acquiring academic skills (Mesman et al., 2001). For example, displays of anger are negatively related to peer status (Blandon et al., 2010), and noncompliant behavior in childhood undermines academic competence in adolescence (Masten et al., 2005). Furthermore, children who exhibit conduct related problems have fewer opportunities to establish skills and competence in other domains because parents tend to limit where they take difficult children (Blandon et al., 2010). From a competence-based perspective, irritating others
generates an abundance of negative feedback, and when “aversive feedback infiltrates multiple
domains, negative self-schemas emerge, placing the child at greater risk for depression or related
problems” (Seroczynski, Cole, & Maxwell, 1997, p. 587).

Behavioral incompetence as conceptualized in this study was heavily overlapping with
externalizing behavior, and there is extant research to show externalizing behaviors predict
future psychopathology (Mesman et al., 2001; Pihlakoski et al., 2006). Further, weak to
moderate covariation among these domains was apparent in first grade. Clinically, there is strong
comorbidity between externalizing problems and internalizing problems (Mesman et al., 2001),
with between 8.5 – 45.4% of children with oppositional defiant or conduct disorder also meeting
criteria for depression (Angold & Costello, 1993 as cited in Wolff & Ollendick, 2006). Many
risk factors common to both domains (genetic, parenting quality, socioeconomic status, and
intellectual ability), may play a role in producing both disorders at the same time (Garber,
Quiggle, Panak, & Dodge, 1991; Masten et al., 2005). For example, temperament factors such as
frustration reactivity and emotion regulation have been shown to both maintain disruptive
behaviors and predict depressive symptoms (Cole, Martin, & Dennis, 2004). Thus, it is possible
that some third variable (temperament, SES, parenting quality) not included in this study may
account for the relationship between competence and depression noted among our sample.

Similar to other domains tested in our study, sex differences were noted in the linkages
between behavioral incompetence and depression. Specifically, behavioral incompetence was a
more consistent predictor of girls’ depressive symptoms across childhood and early adolescence,
than it was for boys. Few studies include behavioral problems as a domain of competence when
testing the competence-based theory, limiting studies for comparison. Rather, conduct related
issues are primarily conceptualized as a psychopathology outcome (i.e., externalizing). Mesman
et al. (2001) did include specific components of externalizing (i.e., oppositional and aggressive behavior) as predictors and measured externalizing broadly for their outcome variable. Similar to this study, these authors found that behavioral incompetence was a reliable predictor of future depression for girls, but not for boys.

Studies consistently report higher prevalence of externalizing symptoms for boys (Meagher et al., 2009). Also, boys’ behavior related problems show greater stability throughout childhood and into adolescence, compared to girls (Meagher et al., 2009). Accordingly, it was expected that behavioral incompetence would be a more salient predictor of boys’ depression versus girls’ depression. This was not the case. If this study had modeled the pathways from early competence to both internalizing and externalizing problems it may have found different, yet significant long-term pathways for boys and girls. Boys’ tend to follow homotypic pathways in which early conduct problems become externalizing disorders that persist across development. Girls, on the other hand, tend to follow heterotypic pathways that change course; early conduct problems among girls often develop into future internalizing disorders (Meagher et al., 2009).

Gender socialization may also play a role in the differential pathways noted for girls and boys in this domain. Parents tend to have higher expectations for girls’ behavior than for boys’ behavior, and misbehavior is often less tolerated from girls, than it is from boys (Zahn-Waxler, Klimes-Dougan, & Slattery, 2001). Therefore, girls who struggle to establish behavioral competence may receive more negative feedback, leaving girls more vulnerable to depressed mood.

Construct Stability. Test-retest correlations for each domain of competence and depression were assessed in this study, and stability was noted in all domains, across the 8-year test interval. The strongest predictor of future competence was prior competence. Academic
competence showed the strongest correlations across time (rs ranged from .52 to .70). Stability coefficients for social competence and behavioral incompetence were both moderate.

Similarly, the strongest predictor of future depressive symptoms was prior depressive symptoms. Cole et al. (1996) reported very high stability of depression ratings across 6-month intervals in third (r = .95) and sixth grade (r = .90). This study found weaker, but significant correlations (rs ranging from .13 to .40) across our longer time intervals. Tram and Cole (2006) also reported strong stability in depressive symptoms from fifth to eighth grade, and concluded that it may be more beneficial to concentrate on variables that predict the onset rather than the change in depression. It appears children’s patterns of competence and emotional functioning emerge as early as six-years-old and persist into early adolescence, highlighting a need for studies to assess these variables among very young children to identify salient markers of risk. These findings highlight the chronicity of early-onset depression, however, it is also the case that only 2 – 16% of the variance in adolescent depression is accounted for by first grade depression.

**Implications for the Competence-based Theory**

The results of this study were generally consistent with Cole et al.’s (1996) research. Results provide support for the competence-based theory to explain depression in children as young as first grade. Like Cole and colleagues, parent-, teacher-, and self-reports of competence predicted children’s future levels of depressive symptoms across two 4-year intervals (first to fifth grade and fifth to ninth grade), and an 8-year interval that spanned from early childhood to early adolescence. Very few, if any, previous studies have tested these longitudinal relations with children as young as first grade, and most studies modeled the relations over very short periods of time.

Failure to generate significant findings during stage-one analysis presented the possibility
that there were temporal boundary conditions for the competence-based theory of depression. Cole et al. (1996) found that some relationships between competence and depression were significant for sixth grade students, but not third grade students. As a result, the authors proposed that development influences how competence and depression relate across time, and they hypothesized that other factors associated with risk to depression (i.e., family factors) may be more salient, than competence related feedback, for younger children. Many argue that developmental considerations preclude the emergence of a measureable cognitive diathesis in young children for the following three reasons. First, Harter (1986) posited that a stable self-concept is not in place until the age of 8 years. Second, early in childhood, children’s self-perceptions tend to be very high and resistant to criticism. Children tend to overgeneralize any success they experience, and only begin to incorporate criticism or negative feedback into their self-assessments around second grade (Stipek & Hoffman, 1980). Third, Cole (1991) highlighted the importance of negative feedback in children’s risk to depression, but many young children do not receive much feedback about performance in some domains (i.e. academic) until later in childhood. Taken together, it was reasonable to expect that very young children’s self-perceptions (competence beliefs) would be less stable and less likely to trigger future depression-related outcomes (Abela, 2001; Turner & Cole, 1994).

However, in stage-two analyses the relations between competence and depression were retested among a more depressed subsample and significant findings emerged; which provided evidence that this study had not identified boundary conditions for the competence-based theory. In fact, stage-two extended Cole’s research and showed that the relations between competence and depression, demonstrated for older children, also hold true for younger children. Specifically, first grade social competence and behavioral incompetence accounted for 2% to 8%
of the variance in later childhood and early adolescent depressive symptoms. As such, it appears that competence deficits are modest, yet reliable markers of depression.

A hallmark of Cole’s work is his careful attention to developmental considerations when conceptualizing depression in childhood. His competence-based theory has garnered empirical support and is accepted as a useful model to identify central markers of children’s vulnerability to depression (Cole, 1990, 1991; Cole et al, 1996; Schwartz, Gorman, Duong, & Nakamoto, 2008). However, also inherent in the competence-based theory is a causal assumption that identifies skill deficits as the mechanism of risk to depression. This aspect of the theory has garnered limited empirical support. For example, Lewinsohn and colleagues (1994) found that depression causes skill deficits. This study also showed that depression was a weak to moderate predictor of future competence. What is emerging from research is that skill deficits are both causes and consequences of depression, suggesting that competence and depression both play an integral role in the etiology, maintenance, and course of children’s psychopathology (McCarty, Vander Stoep, & McCauley, 2007; Pomerantz & Rudolph, 2003).

As mentioned in our literature review, depression is a heterogeneous disorder that involves myriad risk factors including biological, family, and individual characteristics (Cicchetti & Toth, 1998; Egeland et al., 1996). It is rare that one factor predicts the onset of depression; instead it is typically the complex interplay between risk factors, life stressors, and protective factors that leads to negative outcomes (Cicchetti & Toth; Ingram & Price, 2001). “Children with specific disorders have predictable competence problems; children failing to meet the expectations for competence in school or society often have elevated rates of disorder.” (Masten & Curtis, 2000, p. 530). So, while Cole’s (1990) competence-based theory does not account for the complete and complex developmental process underlying children’s depressive symptoms, it
is an effective theory that highlights early markers of risk to depression. This study provides additional support for this theory, and establishes that these markers can be identified in children as early as first grade to predict depression into early adolescence.

**Clinical Implications**

The prevalence of mental health problems among children appears to be increasing (Kessler et al., 2001). Strikingly, 20% of general education students experience psychopathological symptoms commensurate with those found in psychiatrically hospitalized youth (Noam & Hermann, 2002). Experiencing an early onset depressive episode has long lasting consequences that impact many aspects of youth development (Clarizio, 1989). Schools hold much of the burden of confronting these problems, and do so with limited resources (Pagano et al., 2000). But, “without interventions coordinated by schools or community agencies, youth are unlikely to receive required help” (Noam & Hermann, 2002, p. 862). These facts reveal a need to establish low cost, minimally complex, accessible screening and intervention strategies in schools.

The value of Cole and his colleagues’ work has been to isolate early markers of risk to depression. The ability to spot vulnerable children prior to the onset of symptoms is also essential to curbing the long-term consequences of depression. The most effective interventions are those implemented before symptoms impact other areas of development (i.e., lowering self-esteem, fostering a resistance to learning, limiting mastery). Like Cole’s research, this study finds value in using early appraisals of competence to identify children at risk for depression.

In this study, levels of competence in the social and behavioral domains accounted for up to eight per cent of the variance in future depression. Developing competence appears to be an important milestone that fosters overall wellbeing among children, and failing to develop
competence places children at increased risk of experiencing depressive symptoms. The results of this study, combined with Cole’s work, invite one to consider competence in early childhood as a modest but reliable marker of depression risk. Because educational settings routinely attend to children’s competence, there is an opportunity to broadly screen children for risk of depression at school. Such screening need not involve formal, standardized assessment: teachers already have established standards for evaluating children in many domains, along with knowledge of age-appropriate expectations (Pagano et al., 2000), and research shows that parents can also make accurate appraisals of children’s level of competence in multiple domains (i.e., social, academic, and behavioral; Cole, Maxwell et al., 1997). Together, teachers and parents have a unique longitudinal and multifaceted view of children’s level of skill across multiple domains. This information can be helpful in identifying those children at greater risk of experiencing depression.

Two specific profiles emerged from this study that can alert parents and teachers to elevated risk to depression: boys who exhibit social skills deficits in first grade, and girls who exhibit behavioral deficits in first grade. In general, children, in this study were more likely to experience depression if they had difficulty initiating conversations, making friends, saying nice things about themselves, controlling their temper with peers, compromising in conflict, and accepting peers’ ideas. Additionally, children who often broke school rules, argued a lot, were mean to others and did not feel guilty after misbehaving, had difficulty following directions, and frequently screamed, teased, or had temper tantrums were also more likely to experience depression in middle childhood and early adolescence.

While children matching one of these profiles should not be labeled as “high risk for depression,” they do represent a group of vulnerable children who warrant attention to the rest of
the risk constellation. Family history of depression is one of the most robust predictors of depression in children (Kovacs & Lopez-Duran, 2010). Living in poverty, exposure to violence, and having a shy temperament are also associated with risk to depression (Avenevoli et al., 2008; Karevold et al., 2009). Children most at risk will face three or more risk factors; typically only 7% of children with fewer than three risk factors go on to develop depressive symptoms (Beardslee & Gladstone, 2001). As such, vulnerable children identified using a broad screening based on level of competence will obviously possess a wide range of risk levels. Some may warrant ongoing monitoring, some may require formal psychological testing or mental health services, and others may benefit from school-based skill-oriented interventions. Interventions for children exhibiting social incompetence could include small groups to teach children how to initiate conversations with peers, compromise, and make friends; skills that the vulnerable children in this studied lacked. For children exhibiting behavioral incompetence, plans can be developed to reward appropriate conduct and provide teaching and remediation to address negative conduct. Behavior plans aimed at fostering the acquisition of skill will likely be more successful at decreasing risk than plans that apply consequences which further limit children’s opportunities to develop mastery (i.e., suspension from school).

Finally, depressive symptoms and behavior problems often emerge simultaneously. Children are more likely to come to the attention of school personnel because of poor behavior, than for concerns of depression. Families are more likely to seek mental health services for children exhibiting conduct related problems, than for reasons associated with depressive symptoms (Cole & Carpentieri, 1990). The high comorbidity of externalizing and internalizing problems requires that teachers and parents engage in ongoing monitoring and assessment of children’s overall functioning. The most effective interventions will address multiple domains
simultaneously. In sum, programs to strengthen resiliency in children by fostering the
development of competence across multiple salient domains have the greatest chance of
changing the developmental trajectory of vulnerable children to a more adaptive, positive
pathway (Noam & Hermann, 2002).

Limitations of the Study

As noted previously, the sample for this study was relatively high functioning, with a
skewed and restricted range for the depression measures, and high levels of competence in all
three domains. This presented both a methodological challenge to the discriminant function and
regression models, and a boundary condition on the scope of adolescent depression to which
these findings apply. The adoption of a two-stage model addressed the methodological
challenges, but it remains the case that these findings may not generalize to a clinically depressed
sample, nor explain depression among more severely disordered children. Cole stated, “having
one or more domains of competence should enable children to construct positive self-schemas”
(Seroczynski et al., 1997, p. 587). In other words, establishing competence in at least one domain
protects children from the aversive experiences of failures in other domains (Schwartz et al.,
2008). If this is true, most of the participants in this study possessed a protective factor that likely
reduced their cognitive vulnerability to depression. Very different results may emerge with a
sample exhibiting more diverse competence levels.

Additionally, participants reported very low, if any, depressive symptoms, which meant
very few depressed children in this study (in fifth grade 4 out of 508 boys and 9 out of 511 girls
scored in the clinically significant range; in ninth grade 5 out of 478 boys and 40 out of 479 girls
scored in the clinically significant range). Notably, even after selecting a more depressed
subsample for analyses, the mean CDI-S score remained very low (CDI-S = 3.30, compared to
2.01 for whole sample). Only 1% of boys’ and 8% of girls’ fell into this clinically significant depression group in ninth grade. Again, these sample characteristics may limit the generalizability of findings to a more clinically depressed population.

**Future Research**

First, behavioral incompetence and depressive symptoms were significantly related in this study concurrently and across time. The literature consistently provides evidence of significant pathways between internalizing and externalizing problems in childhood (Cole & Carpentieri, 1990; Wolff & Ollendick, 2006), with boys following homotypic pathways and girls following heterotypic pathways (Wolff & Ollendick, 2006). This study only included depression as an outcome variable limiting understanding the different trajectories for boys and girls. Research that includes multiple forms of psychopathology simultaneously will clarify the pathways between these disorders of childhood, and help to identify targets for intervention.

Second, methods such as growth modeling, structural equation modeling, or cascade analyses are more powerful for elucidating the unfolding of complex developmental phenomena. Future studies testing the competence-based theory should utilize more complex methodology and deliberately sample children with a broader range of competence and risk profiles.

Finally, while having ratings from multiple informants was a positive aspect of this study, one informant can also dilute the ratings of others (Bell-Dolan, Reaven, & Peterson, 1993). Research to determine the independent contribution each informant makes to the prediction of future depression in children is important. This information will help to clarify the salience of different types of feedback and guide how to screen and identify children for prevention and intervention programs. Researchers should take into account children’s age when testing these relations as different informants become more salient at different stages of development (Harter,
1985). For example, parent appraisals were most predictive of changes in self-perceptions in third grade (Cole, Maxwell, et al., 1997), whereas, peer appraisals emerged as the most significant influences for sixth grade students (Cole, Maxwell, et al., 1997).

**Conclusion**

This study provides longitudinal evidence for the competence-based theory of depression. These findings contribute new information about the interplay between competence and depression at earlier ages and across longer spans of time. Regression analyses revealed that first grade social competence and behavioral incompetence predicted future depressive symptoms for boys and girls. Academic competence was only a weak predictor of girls’ future depressive symptoms. These markers of risk can be identified as early as first grade. Teachers, parents, and other adults can use Cole’s theory to guide strategies designed to screen and identify vulnerable children, so that interventions can be provided early, before maladaptive patterns are solidified.
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