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Cognitive Vulnerabilities and Depression versus Other Psychopathology Symptoms and Diagnoses in Early Adolescence

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Abstract

Objective—We examined the concurrent associations between multiple cognitive vulnerabilities to depression featured in Hopelessness Theory, Beck’s Theory, and Response Styles Theory and depressive symptoms and diagnoses in a sample of early adolescents. We also examined the specificity of these cognitive vulnerabilities to depression versus anxiety and externalizing psychopathology, controlling for co-occurring symptoms and diagnoses.

Method—Male and female, Caucasian and African-American, 12–13 year old adolescents were assessed in a cross-sectional design. Cognitive vulnerabilities of hopelessness, inferential style, rumination, and self-referent information processing were assessed with self-reports and behavioral tasks. Symptoms and diagnoses of depressive, anxiety, and externalizing disorders were assessed with self-report questionnaires and diagnostic interviews.

Results—Hopelessness exhibited the greatest specificity to depressive symptoms and diagnoses, whereas negative inferential styles, rumination, and negative self-referent information processing were associated with both depressive and anxiety symptoms and diagnoses and, in some cases, with externalizing disorders.

Conclusions—Consistent with cognitive theories of depression, hopelessness, negative inferential styles, rumination, and negative self-referent information processing were associated with depressive symptoms and diagnoses. However, with the exception of hopelessness, most of the remaining cognitive vulnerabilities were not specific to depression. With further maturation of our sample, these cognitive vulnerabilities may become more specific to depression as cognitive styles further develop and consolidate, the rates of depression increase, and individuals' presentations of psychopathology become more differentiated.

Keywords

cognitive vulnerability; depression; psychopathology; adolescence

Extensive research suggests that the transition to adolescence is marked by a significant rise in depressive symptoms and rates of depressive diagnoses, beginning around age 13, such that approximately 20% of young adults will experience a depressive episode by age 18 (e.g., Hankin et al., 1998; Kessler, Avenevoli, & Merikangas, 2001; Twenge & Nolen-Hoeksema, 2002). In addition, the female preponderance in depression rates emerges in adolescence (e.g., Hankin et al., 1998). Further, there is ambiguity about whether non-Caucasians, especially African-Americans, experience as large a rise or as strong an emergence of gender differences in depression as Caucasians during adolescence (e.g., Hayward, Gotlib, Schradley, & Litt, 1999; Kessler et al., 2003; Riolo, Nguyen, Greden, & King, 2005; Siegel, Yancey, Aneshensel, & Schuler, 1999). Given the significant mental health implications of the surge in depression in adolescence, much work has sought to discover risk factors that may influence an individual's vulnerability to depression during this developmental period. In particular, well-corroborated general cognitive vulnerability models of depression may be fruitful in understanding mechanisms involved in the increased risk for depression during adolescence.

Consequently, in this article, we examine the concurrent associations between multiple hypothesized cognitive vulnerabilities and depressive symptoms and diagnoses in a sample of Caucasian and African American, male and female early adolescents (ages 12–13) recruited for the Adolescent Cognition and Emotion (ACE) Project. Project ACE is a prospective, longitudinal study designed to investigate risk factors and mechanisms involved in the onset, emergence of gender differences, and potential emergence of racial differences in depression during adolescence. In addition, given the significant association between depressive and anxiety symptoms and the significant comorbidities between depression diagnoses and anxiety and externalizing disorder diagnoses among youth, in this article, we also examine the specificity of cognitive vulnerabilities to depression versus anxiety and other psychopathologies.

Comorbidity between Depression and Other Psychopathology

An extensive body of research has documented high rates of comorbidity between depression and anxiety in children and adolescents, both at the symptom and diagnostic level (e.g., Avenevoli, Stolar, Li, Dierker, & Ries Merikangas, 2001; Axelson & Birmaher, 2001; Seligman & Ollendick, 1998; Garber & Weersing, 2010). The available evidence suggests that there are shared risk factors for anxiety and depression in youth (Axelson & Birmaher, 2001; Garber & Weersing, 2010), but many of these risk factors are also related to other forms of psychopathology as well (Seligman & Ollendick, 1998). Moreover, some

forms of anxiety (e.g., social anxiety, generalized anxiety) exhibit greater comorbidity with depression than others (Mineka, Watson, & Clark, 1998). In comorbid youth, anxiety is more likely to occur first, followed by onset of depression in late-childhood to adolescence, but there is no consensus on whether this sequence represents a causal relationship (Avenevoli et al., 2001; Seligman & Ollendick, 1998; Garber & Weersing, 2010).

Depression is also highly comorbid with externalizing problems in children and adolescents, at rates higher than expected based on the prevalence of each type of disorder alone (Avenevoli et al., 2001; Ritakallio, Koivisto, von der Pahlen, Pelkonen, Marttunen & Kaltiala-Heino, 2008) or similar/overlapping symptoms (Wolff & Ollendick, 2006). Comorbidity between depression and externalizing disorders in youth is more common for males than females, and conduct problems tend to begin before depression (Wolff & Ollendick, 2006). As in the relationship with anxiety, depression appears to share common risk factors with conduct problems, but it is unclear whether either has a causal effect on the other (Wolff & Ollendick, 2006). The relationship with conduct problems is not specific to depression, however. Anxiety disorders also frequently co-occur with externalizing behavior problems, and early anxiety symptoms may confer risk for later reactive aggression (i.e., aggression in response to perceived offenses or frustrations; Bubier & Drabick, 2009).

Cognitive Vulnerabilities to Depression and their Specificity to Depression

Hopelessness theory

Several well-corroborated general cognitive vulnerability models of depression are relevant to understanding vulnerability to depression in adolescence. For example, according to the Hopelessness Theory (HT) of depression (Abramson, Metalsky & Alloy, 1989), individuals who tend to attribute negative events to stable and global causes, infer negative consequences, and negative self-characteristics are hypothesized to be at increased risk for becoming hopeless about the future, the hypothesized proximal cause of depressive symptoms. Thus, both a negative inferential style for negative events and hopelessness are featured as cognitive vulnerabilities to depression in the HT. Research in adults has found that a negative inferential style is stable over time (e.g., Romens, Abramson, & Alloy, 2009) and increases risk for initial onsets and recurrences of depressive episodes, but not other Axis I disorders (e.g., Alloy et al., 2006). Likewise, hopelessness has been found to predict depressive, but not anxiety, symptoms in adults prospectively (e.g., Alloy & Clements, 1998).

Research in youth suggests that a negative inferential style consolidates and becomes more stable or trait-like during adolescence (e.g., Cole et al., 2008; Gibb & Alloy, 2006; Hankin, 2008a; Turner & Cole, 1994) and thus, once consolidated, may be more likely to predict depressive symptoms alone or in combination with negative life events (e.g., Cole et al., 2008). Indeed, multiple studies (e.g., Abela & McGirr, 2007; Gibb & Alloy, 2006; Hankin, Abramson, Miller, & Haefel, 2004; Hankin, Abramson, & Siler, 2001; Hilsman & Garber, 1995; Lau & Eley, 2008; Lee, Hankin, & Mermelstein, 2010) have found that negative inferential style predicts depressive symptoms among adolescents prospectively alone or in interaction with negative life events, as it does in adults. In addition, some studies of adolescents have reported that a negative inferential style in combination with stressful events specifically predicts depressive, but not anxiety, symptoms (e.g., Hankin, 2008b; Hankin et al., 2004; Joiner, 2000), nor general internalizing and externalizing symptoms (Hankin, 2008b), whereas other studies reported that the negative cognitive style x stress interaction predicts both depressive and anxiety symptoms (Hankin, 2009). And, Brozina and Abela (2006) found that whereas a negative style for inferring causes of events (i.e., attributional style) predicted depressive symptoms specifically, a negative inferential style for consequences and self-characteristics predicted both depressive and anxiety symptoms.

Thus, the specificity of negative inferential styles to depression in youth is as yet unclear and may vary depending on which dimension of inferential style is examined.

Prior to consolidation of an overall negative inferential style during adolescence, Abela and Sarin (2002) suggested that the “weakest link” (the most negative of a youth’s various inferential style dimensions) is the best marker of vulnerability to depression and predicts depressive symptoms better than an additive negative cognitive style composite score. Consistent with this suggestion, several studies (e.g., Abela & McGirr, 2007; Abela, McGirr & Skitch, 2007; Abela & Payne, 2003; Abela & Sarin, 2002; Abela & Scheffler, 2008; Morris, Ciesla, & Garber, 2008) found that the weakest link inferential style in combination with negative events predicts depressive symptoms in youth. However, no studies have examined the specificity of the weakest link to depression versus anxiety or other psychopathology.

In youth samples including adolescents, higher hopelessness was found to correlate with higher depressive symptoms (e.g., Becker-Weidman et al., 2009; Kazdin, French, Unis, Esveltd-Dawson, & Sherick, 1983; Kazdin, Rodgers, & Colbus, 1986) and some studies have found that hopelessness is more strongly associated with depressive than anxiety (e.g., Abela, Gagnon, & Auerbach, 2007; Joiner, 2000; Ostrander, Nay, Anderson, & Jensen, 1995) or aggressive/conduct symptoms (e.g., Asarnow & Bates, 1988; Ostrander et al., 1995). In addition, McCauley, Mitchell, Burke, and Moss (1988) found that youth with current depressive disorders had significantly higher hopelessness scores than those with either remitted depression or other psychiatric disorders.

Beck’s theory

According to Beck’s (1967, 1987) cognitive model of depression, depression-prone individuals are hypothesized to possess negative self-schemata revolving around themes of inadequacy, failure, worthlessness, and loss, which guide their perception, interpretation, and memory of personally relevant experiences. When activated by the occurrence of stressful life events, such negative self-schemata are hypothesized to lead to depressive symptoms through their effect on preferential encoding and retrieval of negative self-referent information. Although most studies testing Beck’s theory (BT) have used self-report measures of dysfunctional attitudes to assess the content of depressive self-schemata, some studies have employed laboratory tasks designed to assess information-processing associated with the operation of self-schemata, such as the Self-Referent Encoding Task (SRET; Alloy, Abramson, Murray, Whitehouse, & Hogan, 1997; Derry & Kuiper, 1981; Markus, 1977). In the SRET, participants judge whether positive and negative adjectives are self-descriptive, with their response times for these judgments also measured, and are given a surprise recall test for the words that they rated. An advantage of the SRET over self-report measures is that it captures cognitive biases associated with self-schemata and does not rely on individuals’ awareness of or ability to report on such biases. We used the SRET in this study.

Studies of youth with depressive symptoms or disorders or at risk for developing depression indicate that they exhibit self-referent encoding and recall biases similar to those found in adults with unipolar depression (e.g., Derry & Kuiper, 1981). For example, Hammen and Zupan (1984) found that dysphoric children endorsed more negative and fewer positive words as self-descriptive compared to non-dysphoric children. In addition, unlike the non-dysphoric children, they failed to exhibit superior recall for positive words endorsed as self-descriptive. Similarly, Timbremont and Braet (2004) found that currently and remitted depressed children and adolescents endorsed more negative words as self-descriptive following a negative mood induction than did never depressed children and adolescents. Also, whereas the never depressed youth recalled more positive self-referent words, the

depressed and remitted depressed youth did not differ in their recall of positive vs. negative self-referent words. Children of depressed mothers also have exhibited evidence of more negative endorsement and recall of self-referent adjectives (Jaenicke et al., 1987; Taylor & Ingram, 1999).

Little work has examined the specificity of negative self-referent information processing to depression in youth. However, in a sample of youth psychiatric inpatients, Gencoz, Voelz, Gencoz, Pettit and Joiner (2001) found that lower endorsement and recall of positive adjectives was associated with depression, but not anxiety, whereas greater endorsement of negative adjectives was associated with anxiety symptoms. Timbremont, Braet, Bosmans, and Vlierberghe (2008) reported that a formerly depressed group of children and adolescents and a group with anxiety and/or disruptive behavior disorders (but no depression) endorsed more positive than negative words as self-descriptive, whereas a currently depressed group endorsed and recalled a similar number of positive and negative words. Thus, there is some evidence that less endorsement and recall of positive adjectives may be specific to depression. However, no study to date has examined the specificity of more negative self-referent processing to depression controlling for disorders comorbid with depression.

Response styles theory

According to Nolen-Hoeksema's (1991) Response Styles Theory (RST), a ruminative response style provides vulnerability for more severe and prolonged depressive symptoms, and has been found to also provide risk for onsets of depressive episodes (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Spasojevic & Alloy, 2001). Rumination is the tendency to focus repetitively on dysphoric mood and the potential meaning, causes, and consequences of the dysphoria (Nolen-Hoeksema, 1991). In contrast, the tendency to distract oneself or problem-solve in response to emotional distress is hypothesized to protect against developing more severe depression. The RST has been supported in adults, with rumination consistently predicting onset of depression (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008 for a review). However, rumination is also associated with psychopathologies other than depression, including anxiety, eating, alcohol, and self-harm symptoms, and the evidence for distraction as a protective factor against depression is mixed (Nolen-Hoeksema et al., 2008).

In youth samples, consistent with RST, prospective studies have found that rumination is associated with greater severity of depressive symptoms over time (e.g., Abela, Aydin & Auerbach, 2007; Abela, Brozina, & Haigh, 2002; Abela, Parkinson, Stolow, & Starrs, 2009; Broderick & Korteland, 2004; Driscoll & Kistner, 2007; Hankin, Lackdawalla, Lee, Grace & Roesch, 2004; Schwartz & Koenigh, 1996), and a greater likelihood of onset of depressive episodes (Abela & Hankin, 2011). As in adults, the findings for distraction are mixed, with one study reporting that distraction predicted decreased depressive symptoms (Abela et al., 2007), and two reporting that distraction did not predict change in depressive symptoms (Abela et al., 2002; Schwartz & Koenig, 1996).

Several studies of adolescent samples have examined the specificity of rumination to depression. In cross-sectional studies, Muris, Roelofs and Meesters (2004) found that rumination correlated more strongly with anxiety than with depressive symptoms, whereas Rood, Roelofs, Bogels, and Alloy (2010) found that rumination was associated with both depressive and anxiety symptoms. Garnefski, Kraaij and van Etten (2005) found that adolescents with general internalizing symptoms exhibited significantly higher rumination than those with either externalizing symptoms or neither type of symptoms. In longitudinal studies, Roelofs et al. (2009) found that higher rumination relative to distraction predicted both increased depressive and anxiety symptoms prospectively in children and adolescents. However, Hankin (2008c) reported that rumination predicted depressive and generalized

internalizing problems, but not anxious arousal or externalizing problems, and Nolen-Hoeksema, Stice, Wade, and Bohon (2007) similarly found that rumination predicted depressive, bulimic, and substance use symptoms, but not externalizing problems, in adolescent girls. Finally, Hankin (2009) found that the interaction of rumination and stressful events predicted increasing trajectories of both depressive and anxious arousal symptoms over time in adolescent girls. Thus, the evidence to date in adolescent samples suggests that rumination may be associated with a range of internalizing symptoms in addition to depression, but not with externalizing symptoms.

The Present Study

In the present study, we examined the concurrent associations between hypothesized cognitive vulnerabilities featured in HT, BT, and RST and depressive symptoms, and current and lifetime diagnoses in a large sample of Caucasian and African-American, male and female early adolescents (ages 12–13) participating in Project ACE. In addition, we examined the specificity of these cognitive vulnerabilities to depressive versus anxiety symptoms and to depressive disorders versus anxiety and externalizing disorders. This study extends most prior research on cognitive risk factors for depression in adolescence both by examining a larger variety of hypothesized cognitive vulnerabilities to depression in one study and by examining the specificity of these cognitive vulnerabilities to depressive symptoms and diagnoses versus anxiety and externalizing disorder psychopathology. In addition, this study is one of only a few studies that have examined specificity of cognitive vulnerabilities to depressive versus other symptoms and disorders with conservative statistical analyses that control for co-occurring symptoms and diagnoses.

Based on the cognitive theories of depression and prior empirical findings in youth reviewed above, we generated the following hypotheses. First, based on HT and previous findings, we hypothesized that hopelessness would be uniquely associated with greater depressive symptoms and diagnoses. Although no study has examined the specificity of the weakest link inferential style to depression in youth, most, but not all, studies found specificity for composite negative inferential style to depression relative to anxiety. Thus, we hypothesized that negative inferential style would be associated with more depressive symptoms and diagnoses, but not with anxiety or externalizing symptoms or diagnoses. Second, based on prior tests of RST in youth, we expected rumination to be associated with both greater depressive and anxiety symptoms and diagnoses, but not with greater externalizing disorders. We had no *a priori* hypotheses about distractive or problem-solving response styles. Finally, based on prior tests of BT examining self-referent information processing, we hypothesized that lower endorsement and recall of positive self-referent adjectives would be specific to depressive symptoms and diagnoses, whereas higher endorsement and recall of negative self-referent words would be associated with both depressive and anxiety symptoms and diagnoses, but not externalizing disorders.

Method

Participants

Sample recruitment—Participants were individuals who completed at least the first study session (Time 1 Session 1) of the Temple University (TU) Adolescent Cognition and Emotion (ACE) Project, a prospective longitudinal study of the development of depressive and anxiety disorders in adolescence, with TU IRB approval. Caucasian and African American male and female adolescents, ages 12 – 13, and their mothers or primary female caretakers (hereafter referred to as “mothers”) were recruited from Philadelphia area public and private middle schools. Participants were recruited in two main ways. First, with the Philadelphia School District’s (PSD) permission and provision of demographic and contact

information, we mailed a letter of introduction and description of Project ACE to parents of Caucasian and African-American students aged 12–13 years old (approximate $N = 8,662$) attending some schools in the PSD. Although mothers could call or return a prepaid postcard indicating their interest in Project ACE, most families were recruited by this method through follow-up phone calls from project staff inviting mothers and their adolescent children to participate. Second, advertisements describing Project ACE were placed in Philadelphia area newspapers (e.g., Metro Kids, community newspapers) and mothers (approximate $N = 134$) called in to indicate their interest.

Mothers interested in participation with their adolescent children from either recruitment method initially completed a screening instrument over the phone to determine eligibility. Inclusion criteria for the study were: 1) the adolescent child was 12 or 13 years old; 2) the adolescent child self-identified as Caucasian/White, African American/Black or Biracial (adolescents could be Hispanic or non-Hispanic as long as they also identified as White or Black); and 3) the mother was also willing to participate. Exclusion criteria were: 1) there was no mother/primary female caretaker available to participate (e.g., mother had died); 2) either the adolescent or mother did not read or speak English well enough to be able to complete the study assessments; and 3) either the adolescent or mother was mentally retarded, had a severe learning disability or other cognitive impairment, had a severe developmental disorder (e.g., autism), was psychotic, or exhibited any other medical or psychiatric problem that would prevent either of them from being able to complete the study assessments. As long as they could adequately complete the study assessments, adolescents or mothers with mild learning disabilities or cognitive/sensory impairments were eligible for participation. Mothers and adolescents who met all study inclusion and exclusion criteria were scheduled for a Time 1 Session 1 (T1S1) assessment, at which time mothers provided written consent and the adolescents provided written assent to participate in Project ACE. The recruitment target was a sample size of 500 adolescents (125 in each gender by race group) and their mothers.

Study sample—Recruitment for Project ACE was not complete at the time this article was written. The sample for this study includes 413 adolescents ($M = 12.89$ years old; $SD = 0.61$) and their female caregivers ($M = 41.51$ years old; $SD = 7.99$; 387 [93.7%] were the mothers of the adolescents) who completed at least T1S1.¹ To date, the study sample is 52% female, 56% African American, and 3.9% Hispanic. Specifically, there are 94 Caucasian males (4 Hispanic), 87 Caucasian females (7 Hispanic), 104 African-American males (3 Hispanic), and 128 African-American females (2 Hispanic). The families exhibited a wide range of socioeconomic status (SES) levels, with 33.7% of participants falling below \$30,000 annual family income, 34.4% falling between \$30,000 – \$59,999, 13.7% falling between \$60,000 – \$89,999, and 18.0% falling above \$90,000. There were no gender differences on family income, maternal education, or mothers' marital status. However, mothers of Caucasian youth had higher education ($t = 4.518$, $p < .01$), family income ($t = 7.528$, $p < .01$), and were more likely to be married currently ($t = 2.375$, $p < .05$) than mothers of African American youth. Of the families who received a recruitment letter, approximately 14% agreed to participate and 6.8% met the study inclusion and exclusion criteria and did, in fact, participate. Adolescent participants did not differ on age, sex, or proportion eligible for free lunch at school from the entire population of PSD students whose mothers initially received recruitment mailings. However, by design, the study sample had a larger proportion of African-American adolescents (56%) than the population of PSD students who received recruitment mailings (31.9%).

¹Time 1 Session 1 data for 413 families were coded, entered, and available for analysis in time for this article. However, as of 1/1/12, 595 mother-adolescent dyads have completed T1S1.

Procedures

Participants came to the Project ACE lab for all study sessions. Time 1 included two sessions spaced an average of 32.90 days apart ($SD = 53.41$), each lasting between 2–3 hours. Both the adolescent and mother completed questionnaires and diagnostic interviews. The adolescents also completed several behavioral tasks. The adolescent and mother each were compensated \$30 for each T1 session, for a total of \$60 each for the initial T1 phase of the study. Participants then were followed longitudinally every 6 months with diagnostic interview, self-report, and behavioral task assessments. The present study only used data from the adolescents' diagnostic interviews, symptom questionnaires, and cognitive vulnerability questionnaires and behavioral tasks from T1S1.

Measures

Diagnostic assessment—The Kiddie – Schedule for Affective Disorders and Schizophrenia – Epidemiological Version (K-SADS-E; Orvaschel, 1995a) is a semistructured diagnostic interview that assesses current and past *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV-TR*; American Psychiatric Association, 2000) Axis I psychopathology in youth. The K-SADS-E was administered to both adolescents and their mothers to assess the youth's lifetime history of all Axis I disorders, as well as current diagnoses. The K-SADS-E was administered first to the mother and then to the youth by the same interviewer, who then created summary ratings. When discrepancies between mother and youth report occurred, the interviewer, if necessary, saw the youth and mother together to discuss the disagreement. Currently, no consensus exists about how best to integrate discrepant information from multiple informants, despite the fact that parents and children often disagree in their reports of the child's symptoms (e.g., Braaten et al., 2001; Cantwell, Lewinsohn, Rohde, & Seeley, 1997; Jensen et al., 1999). To maintain fidelity to the K-SADS-E, we used the interviewer's summary ratings based on his/her 'best-estimate' clinical judgment from interviewing both mother and child. The K-SADS-E diagnostic interviews have good inter-rater and retest reliability (Orvaschel, 1995b), with κ 's of .73 and .72 for Major Depression and Dysthymia, respectively, .63–.75 for anxiety disorders, and .51–.77 for other disorders (Orvaschel, 1995b).

To ensure standardization of diagnostic assessments, Dr. Orvaschel, one of the creators of the K-SADS-E, conducted a 3-day intensive training session at TU on the use of the K-SADS-E at the project's start. The 3-day training was videotaped and used to continue to train interviewers throughout the project. Following Dr. Orvaschel's 3-day training, interviewers underwent further intensive training on the K-SADS-E and on making *DSM-IV-TR* diagnoses, consisting of roughly 200 hours of reading and didactic instruction, training on case vignettes and videotaped interviews, role-playing, observation of live interviews by experienced interviewers, and extensive practice conducting live interviews with supervision and feedback from the diagnostic trainers. Throughout the project, interviewers continued to receive extensive individual feedback. The K-SADS-E interviews were administered by Clinical Psychology postdoctoral fellows, Clinical Ph.D. students, individuals with Clinical or Counseling Masters degrees, and post-BA research staff. Inter-rater reliability based on 120 pairs of ratings (5 raters for each of 24 diagnoses from 10 K-SADS interviews) in Project ACE was $\kappa = .85$. Project interviewers were blind to other project data, including the adolescents' cognitive vulnerabilities. We used both current and lifetime child diagnoses in the present analyses.

Depressive symptoms—The Children's Depression Inventory (CDI; Kovacs, 1985) is the most widely used self-report measure assessing depressive symptoms in youth. It's designed for use with 7 – 17 year olds and consists of 27 items, reflecting affective, behavioral, and cognitive symptoms of depression. Each item is rated on a 0–2 scale. Total

scores from all items were used and ranged from 0–54. Higher scores indicate more depressive symptoms. The CDI has good reliability and validity as a measure of youths' depressive symptoms (Klein, Dougherty, & Olino, 2005). Internal consistency in this sample was $\alpha = .80$.

Anxious Symptoms—The Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997) is a 39-item self-report questionnaire assessing anxiety symptoms in youth. It includes physical anxiety (tense/restless and somatic/autonomic symptoms), social anxiety (humiliation/rejection and public performance fears), harm avoidance (perfectionism and anxious coping), and separation anxiety (fears of separation from parents) factors. Adolescents responded to each item on a 4-point likert scale with response options of never, rarely, sometimes, or often. The MASC total score (MASC-T) and 4 subscale scores were used, with higher scores indicating more anxiety. The MASC has excellent retest reliability and good convergent and discriminant validity (March et al, 1997; March & Albano, 1998). Internal consistencies in this sample were $\alpha = .86$ for the MASC-T, $\alpha = .80$ for physical anxiety, $\alpha = .83$ for social anxiety, $\alpha = .67$ for harm avoidance, and $\alpha = .68$ for separation anxiety.

Negative cognitive styles—The Adolescent Cognitive Style Questionnaire-Modified (ACSQ-M; Hankin & Abramson, 2002) is a modified version of the original ACSQ that assesses inferential style regarding the causes, consequences, and self-worth implications of negative life events, the cognitive vulnerability to depression featured in HT. The original ACSQ assessed inferential style for negative events in the achievement and interpersonal domains, whereas the ACSQ-M also assesses inferential style in the appearance domain, another content area of importance to adolescents. Adolescents are presented with 12 hypothetical achievement, interpersonal, or appearance negative events (4 per domain) and are asked to make inferences about the causes (internal-external, stable-unstable, and global-specific), consequences, and self-worth implications of each hypothetical event. Each dimension is rated from 1 to 7, with higher scores indicating a more negative cognitive style. Several scores from the ACSQ-M were examined in the present study. First, to be comparable with previous studies using the original ACSQ, each adolescent's overall negative composite score was calculated based on a sum of the stability, globality, consequences, and self dimensions across the achievement and interpersonal domains, following Alloy et al. (2000; 2006). The negative composite score for each content domain (achievement, interpersonal, appearance) was also calculated. Second, following Abela and Sarin (2002), each adolescent's weakest link score was derived as his/her most negative inferential style dimension. Finally, because negative inferential style may not have fully consolidated by ages 12–13 and prior research suggests that specificity of inferential style to depression vs. other psychopathology may vary by dimension, we also examined scores for each individual inferential style dimension (internality, stability, globality, consequences, self), calculated as the sum of items tapping that dimension across the achievement and interpersonal domains. The ACSQ has demonstrated excellent internal consistency, good retest reliability, and adequate factor structure as a measure of HT's cognitive vulnerability to depression among adolescents (Hankin & Abramson, 2002). Internal consistencies in this sample were $\alpha = .94$ for the overall negative composite, and $.78 - .87$ for the 5 individual dimensions.

Response styles—The Children's Response Styles Questionnaire (CRSQ; Abela, Vanderbilt, & Rochon, 2004) is a 25-item self-report questionnaire that assesses youths' styles to respond to sad/depressive moods with rumination, distraction, or problem-solving. For each item, adolescents rate the frequency of their thoughts or feelings when they are sad on 4-point scales of never, sometimes, often, or almost always. Higher scores indicate a

greater tendency to engage in rumination, distraction, or active problem-solving when feeling sad or depressed. Past research with the CRSQ indicated good validity and moderate internal consistency (Abela et al., 2004). Internal consistencies for this sample were α 's = .83, .55, and .68 for the rumination, distraction, and problem-solving subscales.

Hopelessness—The Children's Hopelessness Scale (CHS; Kazdin, French, Unis, Esveltd-Dawson, & Sherick, 1983) is a 17-item self-report questionnaire that assesses hopelessness in youth in the previous two-weeks. Adolescents respond by answering true or false to the items. Higher scores on the CHS indicate more hopelessness. The CHS has shown good construct validity (Abela, Brozina, & Haigh, 2002; Kazdin, Rodgers, & Colbus, 1986; Spirito, Williams, Stark, & Hart, 1988) and alpha coefficients ranging from .45 – .97 (e.g., Abela, 2001; Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995; Kazdin et al., 1986), with $\alpha = .64$ in a sample of African American adolescents (DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994). Internal consistency in this sample was $\alpha = .60$.

Self-referent encoding—The Self-Referent Encoding Task (SRET; Derry & Kuiper, 1981; Hammen & Zupan, 1984), adapted in computerized form for this study, is a behavioral measure of cognitive vulnerability that assesses judgments of self-descriptiveness, response latencies, and free recall for emotionally-valenced stimuli. Adolescents are presented with 22 positive (e.g., happy, attractive) and 22 negative (e.g., awful, lonely) adjectives in random order on a laptop computer and asked to respond “yes” or “no” to one of two questions about the adjective by pressing a labeled Yes or No button on the computer keypad. Half the adjectives of each valence (randomly selected) were preceded by the question, “Describes you?” (self-referent judgments) and the other half were preceded by the question, “Has an ‘E’ in it?” (structural judgments). The adolescent's Yes or No judgments and response times (RTs) for each judgment were recorded. Immediately after completing the judgment task, the adolescents were given an incidental free recall test for the adjectives. They had 5 minutes to verbally report as many adjectives as they could recall from the task and researchers recorded their responses. The variables used for analysis included the number of positive and negative adjectives judged as self-descriptive (“like me”), the average RTs for positive and negative adjectives judged as self-descriptive, and the ratio of correctly recalled negative self-referent (judged “like me”) adjectives to the total number of self-referent adjectives. Given that the ratio of correctly recalled positive self-referent adjectives to the total number of self-referent adjectives was simply the inverse of the ratio for negative self-referent adjectives, it was redundant and not used.

Data Analysis Approach

Prior to conducting the main hypothesis testing analyses, a series of preliminary analyses were conducted. First, we examined whether demographic variables (gender, race, family income) were associated with any of the dependent variables, using linear regressions for predictions to depressive (CDI) and anxiety (MASC) symptoms and logistic regressions for predictions to K-SADS diagnoses. Any demographics that were significantly associated with particular dependent measures were controlled in the subsequent hypothesis testing analyses predicting that dependent variable. A second set of preliminary analyses examined the correlation between CDI and MASC scores and the presence of significant comorbidities between various current and lifetime K-SADS diagnoses.

In order to examine specific or unique associations between the cognitive vulnerabilities and adolescents' symptoms and diagnoses, in the main hypothesis testing analyses predicting depressive symptoms (CDI), we controlled for anxiety symptoms (MASC-T), and we controlled for depressive symptoms (CDI) when predicting to anxiety symptoms (MASC-T). When a cognitive vulnerability measure predicted MASC-T scores significantly, we also

examined the MASC subscales to determine which forms of anxiety were associated with the cognitive vulnerability. Similarly, in tests of cognitive vulnerability predictors of each type of diagnosis, we controlled for any comorbid diagnoses to examine the specificity of predictive relationships. Consequently, in the main hierarchical linear regression analyses examining cognitive vulnerability predictors of depressive or anxiety symptoms, any associated demographic variables were entered in Step 1, the other type of symptoms was entered in Step 2, and the cognitive vulnerability predictor was entered in Step 3. Similarly, in the hierarchical logistic regression analyses of cognitive vulnerability predictors of diagnostic outcomes, associated demographics were entered in Step 1, significant comorbid diagnoses were entered in Step 2, and the cognitive vulnerability predictor was entered in Step 3. Finally, the three 2-way interactions between the cognitive vulnerability predictor, gender, and race were entered in Step 4 and the 3-way interaction of the cognitive vulnerability, gender, and race was entered in Step 5 to examine potential moderating effects of gender and race. Diagnoses that were too infrequent in the sample (see Table 1 for which diagnoses were too rare) were not included in the hypothesis testing analyses.

Results

Preliminary Analyses

Table 1 presents the means and standard deviations (SDs) of the symptom scores, as well as current and lifetime diagnostic rates for the study sample of adolescents as a whole and broken down by the four gender x race groups. Gender was significantly associated with CDI scores ($p < .01$), such that girls ($M = 7.68$, $SD = 6.76$) had higher depressive symptoms than boys ($M = 6.24$, $SD = 5.34$), and with MASC-Total scores ($p < .05$) with girls ($M = 41.66$, $SD = 14.49$) again displaying higher anxiety symptoms than boys ($M = 38.77$, $SD = 13.86$), as well as with the MASC Separation Anxiety (girls $M = 7.14$, $SD = 4.28$; boys $M = 6.24$, $SD = 4.08$) and Social Anxiety (girls $M = 9.57$, $SD = 5.84$; boys $M = 7.99$, $SD = 5.47$) subscales specifically. No other demographics were associated with depressive or anxiety symptoms. There were gender differences in lifetime attention deficit hyperactivity disorder (ADHD) rates ($p < .01$), with boys (24%) exhibiting higher rates than girls (17%). Race was associated with lifetime rates of separation anxiety disorder (SAD), anxiety disorders overall, ADHD, oppositional defiant disorder (ODD), and any externalizing disorder (ADHD, conduct disorder [CD], or ODD), and with rates of current ODD (all p 's $< .05$). In all cases, African-American adolescents exhibited lower rates of these diagnoses than Caucasian adolescents. Family income was associated with lifetime rates of any diagnosis, SAD, current and lifetime anxiety disorders, and disruptive behavior diagnoses (DBD; as well as the specific current and lifetime diagnoses included in the DBD category including CD and ODD). In all cases, increased family income was associated with lower rates of these diagnoses (all p 's $< .05$).

Table 2 presents the means and SDs of the cognitive vulnerability measures for the whole sample and for the four gender x race groups. Several of the cognitive vulnerabilities varied by gender or race. Scores on the ACSQ overall negative composite ($t = 1.97$), interpersonal negative events composite ($t = 2.29$), internality ($t = 2.17$), stability ($t = 3.15$), and weakest link ($t = 2.18$) dimensions differed by race (all p 's $< .05$), with African American youth exhibiting more positive cognitive styles than Caucasian youth. The ACSQ negative consequences dimension differed by gender ($t = 1.99$, $p < .05$), with boys inferring more negative consequences than girls. In addition, girls exhibited higher CRSQ rumination than boys ($t = -2.00$, $p < .05$). Finally, girls recalled more adjectives correctly than boys on the SRET ($t = -3.15$, $p < .01$). There were no gender x race interactions on the cognitive vulnerability measures.

Table 3 displays the Pearson correlations among the cognitive vulnerability measures and CDI and MASC scores. CRSQ rumination correlated positively with hopelessness (CHS) and the various ACSQ cognitive style scores, and hopelessness also had small, but significant, positive correlations with ACSQ achievement, interpersonal, and appearance domain composites. Both rumination and hopelessness correlated positively with the number of negative adjectives endorsed as self-referent and negatively with the number of positive adjectives endorsed as self-referent on the SRET. Depressive (CDI) and anxiety (MASC) symptoms correlated with each other ($r = .37$), and both types of symptoms correlated with ACSQ cognitive style, rumination, hopelessness, and SRET self-referent adjectives endorsed.

Comorbidity among current (see Table 4) and among lifetime (see Table 5) diagnoses was assessed by calculating Fisher's exact test for the association between each pair of diagnoses. This method was utilized due to the categorical nature of the data and small sample sizes in some cells, which precludes the use of alternative methods such as odds ratios. Any $p < .05$ association between diagnoses was considered a significant comorbidity. As seen in Table 4, any current depressive disorder was significantly associated with any current anxiety disorder, ADHD, and any DBD (i.e., CD or ODD). Any current anxiety disorder was also associated with ADHD, any DBD, and ODD specifically. Finally, ADHD was also associated with any DBD and ODD specifically. As shown in Table 5, any lifetime depressive disorder was significantly associated with any lifetime anxiety disorder (as well as with specific phobia, social phobia, and GAD, specifically), any lifetime externalizing disorder and ADHD specifically. Lifetime major depressive disorder (MDD) was significantly associated with any lifetime anxiety disorder and GAD. There were also significant comorbidities among various anxiety disorders and between the anxiety disorders and various externalizing disorders (see Table 5).

Cognitive Vulnerability Predictors of Symptoms

Table 6 displays the cognitive vulnerability predictors of depressive and anxiety symptoms, controlling for the other type of symptoms.

Self-report cognitive vulnerability measures—As shown in Table 6, and as hypothesized, greater hopelessness (CHS) predicted higher depressive symptoms uniquely, controlling for anxiety symptoms, but did not predict anxiety symptoms with depressive symptoms controlled. In contrast, both higher depressive and total anxiety symptoms (and all MASC subscales) were predicted significantly by greater CRSQ rumination, controlling for the other type of symptoms. Whereas higher CRSQ distraction and problem-solving predicted lower depressive symptoms controlling for anxiety, they predicted higher total anxiety (and physical and harm avoidance anxiety) symptoms, controlling for depression.

Both higher depressive and total anxiety symptoms (as well as physical, social, and separation anxiety symptoms in particular) were predicted significantly by more negative cognitive styles on the ACSQ composites and the globality and consequences dimensions, controlling for the other type of symptoms. The ACSQ weakest link, internality, stability, and self dimensions predicted anxiety, but not depressive, symptoms.

Task-based cognitive vulnerability measures—Also as displayed in Table 6, a lower number of positive adjectives and a higher number of negative adjectives endorsed as self-descriptive on the SRET predicted higher depressive symptoms, controlling for anxiety symptoms, but did not predict total anxiety symptoms, controlling for depression. However, it should be noted that fewer positive adjectives endorsed as self-descriptive was also related to higher social anxiety symptoms on the MASC.

Cognitive Vulnerability Predictors of Diagnoses

Tables 7 and 8 summarize findings from the hierarchical logistic regression analyses in which various current (Table 7) or lifetime (Table 8) diagnoses were regressed onto each cognitive vulnerability measure, controlling for relevant demographics and any significantly comorbid diagnoses.

Self-report cognitive vulnerability measures—As hypothesized, higher hopelessness (CHS) and higher rumination (CRSQ) both were associated uniquely with greater likelihood of any current depression diagnoses, controlling for comorbid diagnoses (Table 7). CRSQ distraction and problem-solving were not related to any current diagnoses.

Controlling for comorbid diagnoses, more negative cognitive styles on the ACSQ achievement, interpersonal, and appearance domain composites and the weakest link dimension were associated with a greater likelihood of current social phobia. In addition, a style to infer more negative consequences was related to a greater likelihood of any current anxiety disorder and a style to infer stable causes of negative events was associated with a greater likelihood of current ODD and DBD diagnoses, controlling for comorbid diagnoses.

For lifetime diagnoses (Table 8), even controlling for demographics and comorbid diagnoses, higher CRSQ rumination was associated with greater likelihood of both any depression and GAD diagnoses, whereas higher distraction was associated with lower likelihood of any anxiety and SAD diagnoses. Although higher hopelessness (CHS) was associated marginally with any depression lifetime, this relation was not significant when comorbid diagnoses were controlled.

On the ACSQ, more negative cognitive styles on the consequences and self dimensions were associated both with higher lifetime episodic depression and externalizing disorders, controlling for comorbid diagnoses. More negative cognitive styles on the achievement, interpersonal, and appearance composites all were associated uniquely with greater likelihood of lifetime social phobia, whereas more negative overall composite and weakest link scores were associated uniquely with greater lifetime externalizing disorders, controlling for comorbid diagnoses.

Task-based cognitive vulnerability measures—Although overall correct recall and recall of negative self-referent adjectives were associated with any current depression diagnoses, neither of these associations was significant with comorbid diagnoses controlled (see Table 7). Slower RT for endorsing negative adjectives as self-descriptive was associated with a greater likelihood of current DBD diagnoses.

With respect to lifetime diagnoses (Table 8), on the SRET, more negative adjectives endorsed as self-descriptive was associated specifically with greater likelihood of lifetime social phobia, whereas a greater number of positive words judged as self-descriptive was associated with greater likelihood of SAD specifically, controlling for comorbid lifetime diagnoses. Whereas slower RTs for endorsing positive words as self-descriptive was associated with greater likelihood of lifetime GAD, slower RTs for judging negative words as self-descriptive was associated with greater likelihood of lifetime MD (but both these relationships became marginally significant controlling for comorbid diagnoses – see Table 8). However, slower RTs for judging negative words as self-descriptive were significantly associated with greater likelihood of CD and DBDs, controlling for comorbidities. Controlling for comorbid diagnoses, a greater likelihood of DBDs was associated marginally with higher recall of negative self-descriptive adjectives.

Moderation by Gender and Race

Although future publications will examine the role of gender and race as moderators of associations between cognitive vulnerabilities and depression, anxiety, and externalizing problems in depth, we briefly summarize main moderation findings here. At the symptom level, hopelessness predicted greater depressive symptoms more strongly for girls than boys and distraction predicted greater total anxiety symptoms more strongly for boys than girls. In addition, higher recall of negative self-referent adjectives predicted higher depressive symptoms in all subgroups except African American males. For current diagnoses, whereas a more negative inferential style (ACSQ) predicted increased rates of social phobia and any current anxiety disorder for African American adolescents, it predicted decreased rates of any anxiety disorder for Caucasian adolescents. Distraction also predicted decreased rates of any anxiety disorder more strongly for Caucasian than African American adolescents. Finally, for lifetime diagnoses, the associations between more negative inferential style in the achievement domain, higher rumination, and lower problem solving with greater lifetime rates of anxiety disorder were stronger for girls than boys. And, more negative inferential styles predicted greater lifetime rates of any depressive disorder more strongly for African American than Caucasian adolescents.

Discussion

The present investigation examined associations between cognitive vulnerabilities to depression featured in Hopelessness (Abramson et al., 1989), Beck's (1967; 1987), and Response Styles (Nolen-Hoeksema, 1991) theories and symptoms and diagnoses of depression and other psychopathology in a sample of Caucasian and African American, male and female early adolescents (ages 12–13) recruited for Project ACE. We tested hypotheses that negative inferential styles, hopelessness, rumination, and negative self-referent information processing would be associated significantly with depressive symptoms and diagnoses, and that some of these cognitive vulnerabilities would be specifically associated with depression, but not with anxiety or externalizing psychopathology. Moreover, we provided a more stringent test of specificity than most prior studies by controlling for co-occurring symptoms and diagnoses.

Our initial analyses regarding demographic differences in symptoms and diagnostic rates found relatively small, but significant, gender differences in depressive symptom levels, with girls exhibiting higher depressive symptoms than boys. This is consistent with previous epidemiological findings that gender differences in depression are only beginning to emerge in this age group (e.g., Hankin et al., 1998; Kessler et al., 2001; Twenge & Nolen-Hoeksema, 2002). We did not obtain gender differences in rates of depression diagnoses, and this too is consistent with epidemiological research suggesting that such gender differences in depression diagnostic rates will emerge as our sample ages and is followed longitudinally (e.g., Hankin et al., 1998). Interestingly, whereas some racial differences occurred in anxiety and externalizing disorders, with Caucasian adolescents exhibiting higher rates than African American adolescents, there were no significant racial differences in depressive symptoms or diagnoses. One reason that African Americans in our sample may not have differed on rates of depression and actually had lower rates of anxiety disorders than Caucasians is that African American participants exhibited more positive cognitive styles than Caucasian participants on the ACSQ. At ages 12–13, negative cognitive styles may not yet have fully consolidated and become stable (e.g., Cole et al., 2008; Gibb & Alloy, 2006; Hankin, 2008a; Turner & Cole, 1994) and, thus, may not yet provide vulnerability to depressive disorders, as they will when our sample matures further. Given that a recent review (Anderson & Mayes, 2010) concluded that US ethnic minority youth have higher prevalence rates of depression and anxiety than Caucasian youth, it is possible that a preponderance of depressive symptoms and diagnoses in African American

participants may emerge in middle adolescence as our sample ages. Alternatively, some prior research suggests that African American females may not experience as great a rise in rates of depression during adolescence as Caucasian females (e.g., Hayward et al., 1999; Kessler et al., 2003; Riolo et al., 2005; Siegel et al., 1999) and, thus, emerging racial differences in depression rates in our sample over follow-up may also depend on gender. Interestingly, although lower family income was associated with higher rates of anxiety and externalizing disorders, low SES was not a risk factor for depression as yet. SES effects on depression may also emerge as depression rates themselves increase in middle adolescence. Finally, congruent with prior research (e.g., Avenevoli et al., 2001; Garber & Weersing, 2010; Wolff & Ollendick, 2006), we also obtained significant comorbidities between depressive disorders and anxiety and externalizing disorders.

Associations and Specificity of Cognitive Vulnerabilities with Depression

Consistent with predictions based on some of the cognitive theories of depression, we found that several cognitive vulnerabilities were associated significantly with depressive symptoms and diagnoses. However, few were associated uniquely with depression once co-occurring symptoms and diagnoses were controlled.

Hopelessness theory—As predicted by HT, greater hopelessness was significantly associated with higher levels of depressive symptoms, higher rates of current depression diagnoses, and marginally associated with higher lifetime rates of depression. In addition, as hypothesized, the relationship between hopelessness and depression was unique, with symptoms and diagnostic rates of current, though not lifetime, depression significant when controlling for comorbid symptoms and diagnoses respectively. In addition, hopelessness was not associated with anxiety symptoms or anxiety and externalizing disorders. The hopelessness – depressive symptoms association was stronger for girls than boys, which may suggest that girls are less able than boys to counteract the depressogenic effects of hopelessness. Indeed, hopelessness exhibited the greatest specificity to depression of any cognitive construct we assessed. This is consistent with the hypothesized role of hopelessness as a proximal, sufficient cause of depression in the HT (Abramson et al., 1989).

In general, negative inferential styles and the weakest link (Abela & Sarin, 2002) were associated more consistently with anxiety symptoms and diagnoses than with depression symptoms and diagnoses. Although more negative styles on the ACSQ composites and globality and consequences dimensions were associated with both higher depressive and anxiety symptoms (controlling for the other type of symptoms), the internality, stability, self, and weakest link dimensions were associated uniquely with greater anxiety symptoms. In addition, controlling for comorbid diagnoses, negative styles on most of the ACSQ composites and dimensions (including the weakest link) were related to higher rates of current social phobia and any anxiety disorders. Finally, many of the ACSQ scores also were associated with higher lifetime social phobia, although the negative consequences, self-characteristics, and weakest link dimensions were associated with greater lifetime episodic depression. African American adolescents exhibited stronger relations between negative ACSQ styles (including the weakest link) and social phobia and depression than Caucasian adolescents.

Epidemiological findings (Avenevoli et al., 2001; Seligman & Ollendick, 1998; Garber & Weersing, 2010) indicate that onset of anxiety disorders typically precedes onset of depression in an individual's lifetime, with anxiety disorders often beginning in childhood and early adolescence and depression emerging in mid- to late-adolescence or early adulthood. Thus, negative inferential styles may be associated with anxiety disorders more

strongly than depression in our early adolescent sample, but may emerge as a stronger and more specific predictor of depression as our sample matures and depression rates increase. Moreover, those adolescents in our sample with an association between negative inferential styles and anxiety at Time 1 may be at greatest risk for developing depression over time. There may be several explanations for the finding that African American adolescents exhibited a stronger association between some of the negative inferential styles and social phobia and depression than did Caucasian adolescents. First, African American youth tend to go through pubertal maturation earlier than Caucasian youth (e.g., Mendle, Harden, Brooks-Gunn, & Graber, 2010), and thus, their cognitive styles may be more fully consolidated and, in turn, more predictive of psychological distress than those of their Caucasian counterparts. Second, African American adolescents may have experienced greater life stress (including racial discrimination experiences) than Caucasian adolescents and as a consequence, their cognitive styles (vulnerabilities) may be more predictive of psychopathology in the context of a more stressful environment. Given that Project ACE includes measures of pubertal development and life stress (including racial discrimination experiences), it will be possible to test these hypotheses regarding possible mechanisms that mediate racial differences in the future.

Of note, according to HT, the relationship between negative inferential style and depression should be moderated by the occurrence of stressful life events. Given that the present study was cross-sectional and life events only are assessed at the prospective follow-up sessions of Project ACE, we were unable to determine the role of negative life events in our analyses. Therefore, the mixed findings on specificity of various inferential style scores to depression may be explained by the absence of consideration of life events.

Beck's theory—In this study, we assessed the negative self-schemata hypothesized to provide vulnerability to depression in Beck's model with a self-referent information-processing task (SRET), rather than with self-report measures of the content of these self-schemata (e.g., dysfunctional attitudes). Based on prior studies examining self-referent processing and depression in youth, we expected lower endorsement of positive adjectives as self-descriptive to be uniquely associated with depression and higher endorsement of negative adjectives as self-descriptive to be associated with both depression and anxiety. However, we obtained the opposite findings, with a higher number of negative adjectives endorsed as self-descriptive uniquely associated with higher depressive symptoms and a lower number of positive adjectives endorsed as self-descriptive associated with both higher depressive and social anxiety symptoms. It should be noted that prior studies of the SRET have not controlled for comorbid symptoms and diagnoses and this may contribute to differences between our findings and those of prior studies. Better recall of negative self-referent adjectives was also uniquely associated with higher depressive symptoms. In addition, although higher recall of negative self-referent adjectives was also associated with a greater likelihood of current depressive diagnoses, consistent with BT, this association did not remain significant with comorbid diagnoses controlled. The fact that greater endorsement and recall of negative self-referent adjectives (and lower endorsement of positive self-referent adjectives) was associated with current depressive symptoms and diagnoses is consistent with Beck's model. However, for lifetime diagnoses, the various measures of endorsement and recall of self-referent adjectives were associated significantly with lifetime anxiety and externalizing disorders, rather than depressive disorders. These findings suggest the possibility that negative self-referent information processing may be more of a current state marker of depression in early adolescents, rather than a trait vulnerability factor for depression. Given that self-concept is still developing during adolescence (Kroger, Marinussen & Marcia, 2010), it is also possible that self-referent information processing measures will more strongly predict depression prospectively as our sample matures.

Responses styles theory—As hypothesized, ruminative response styles were significantly associated with higher depressive symptoms, as well as presence of current and lifetime depressive diagnoses, even controlling for concurrent symptoms or comorbid diagnoses, consistent with RST. The relationship between rumination and depression exhibited limited specificity, however. As predicted, higher rumination also was associated with higher anxiety symptoms and a greater likelihood of lifetime GAD, with comorbid symptoms or diagnoses controlled, and the rumination – GAD association was stronger for girls than boys, consistent with Hankin's (2009) prospective findings. This suggests that by early adolescence, the link between rumination and excessive worry and anxious arousal is already stronger for females than males and may place these girls at higher risk for depressive disorders as they mature.

Consistent with RST, higher distraction and problem-solving were associated with lower depressive symptoms, with the other type of symptoms controlled, but not with lower rates of depressive diagnoses. In contrast, higher distraction was associated with higher anxiety symptoms, but lower likelihood of lifetime SAD and anxiety disorders overall, controlling for comorbid lifetime diagnoses. Moreover, distraction predicted lower rates of current anxiety disorders more strongly for Caucasian than African American adolescents. These findings suggest that distraction may be more effective in protecting against anxiety disorders for some adolescents than others. Whether this emotion regulation strategy confers similar differential protection as a function of race against the development of future depressive disorders awaits prospective findings from Project ACE.

Study Strengths and Limitations

The present study had several important strengths. First, we examined the associations between cognitive vulnerabilities and depression and other psychopathology in a large, representative, community-based sample of early adolescents who were diverse on gender, race, and SES, unlike the predominantly white, middle-class samples studied in most prior research. As such, findings regarding racial differences in cognitive vulnerability – psychopathology associations are novel and require replication both in our own sample prospectively and in other samples. Second, we included not only adolescents' self-reported symptoms of depression and anxiety, but also structured diagnostic interview-based psychiatric diagnoses of the adolescents based on both maternal and youth report. Third, we assessed multiple hypothesized cognitive vulnerabilities to depression in the same study, with both self-report and task-based measures. Finally, our tests of the specificity of cognitive vulnerabilities associated with depression versus other symptoms and disorders were very stringent, involving controls for co-occurring symptoms or diagnoses.

However, it is important to consider this study's limitations as well. First, the present study was cross-sectional and, as such, cannot address issues of temporal precedence of cognitive vulnerabilities for depression or other psychopathology. Second, the absence of assessment of stressful life events limited our ability to test the cognitive vulnerability – stress hypotheses of Hopelessness and Beck's theories and their potential specificity. Future findings from Project ACE should remedy both of these shortcomings. Finally, this study did not include measures of cognitive constructs that would be hypothesized to provide specific vulnerability to anxiety (e.g., anxiety sensitivity, attentional bias for threat) or externalizing (e.g., hostile attributional bias) disorders.

Implications for Research, Policy, and Practice

Consistent with cognitive theories of depression and as predicted, hopelessness, negative inferential styles, rumination, and negative self-referent information processing were associated with depressive symptoms and diagnoses. However, with the exception of

hopelessness, which was uniquely associated with depressive symptoms and disorders, most of the remaining cognitive vulnerabilities we examined were not specific to depression. Specificity of the relationships between various risk factors and different forms of psychopathology may develop over the course of adolescence. Inasmuch as depression rates really begin to rise in mid-adolescence (e.g., Hankin et al., 1998), future results from Project ACE may find that with further maturation of our sample, these cognitive vulnerabilities will become more specific to depression as the rates of depression increase and individuals' presentations of psychopathology become more differentiated. The relatively low rates of occurrence of disorders in this early adolescent cohort also may influence the findings and explain some of the different relationships obtained between cognitive vulnerabilities and depressive symptoms versus diagnosable depression. Longitudinal, prospective examination of this sample will allow further investigation of the predictive relationship between cognitive vulnerabilities and depression. This also will allow us to incorporate the important role of stressful life events in moderating the cognitive vulnerabilities – depression predictive association. Finally, as we follow this sample longitudinally, we will be able to determine whether gender and racial differences in cognitive vulnerabilities more fully emerge as predicted, and the extent to which this predicts gender and racial disparities in future depression rates. Given that we already observed some gender and racial differences in cognitive vulnerability – psychopathology associations in this sample of early adolescents, a research policy implication of our findings is that it is essential to include adequate numbers of male and female and non-Caucasian participants in future studies in order to more fully understand the determinants of depression and other psychopathology for different subsets of adolescents.

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Table 1

Means (SDs) and Frequencies for Symptom and Diagnostic Outcome Variables

Symptoms	Full Sample (N=413) Mean(SD)	Caucasian Male (N=94) Mean(SD)	Caucasian Female (N=87) Mean(SD)	African American Male (N=104) Mean(SD)	African American Female (N=128) Mean(SD)
Total Depressive Symptoms (CDI)	7.01 (6.18)	5.92 (5.28) ^a	8.03 (7.03) ^b	6.53 (5.41) ^a	7.46 (6.61) ^b
MASC Physical symptoms	7.82 (5.68)	7.02 (5.34) ^a	8.37 (6.41) ^a	8.14 (5.53) ^a	7.76 (5.54) ^a
MASC Social Anxiety	8.83 (5.72)	8.86 (5.81) ^a	9.08 (5.68) ^b	7.25 (5.07) ^a	9.88 (5.93) ^b
MASC Harm Avoidance	16.94 (4.48)	16.70 (4.6) ^a	17.04 (4.75) ^a	17.13 (4.05) ^a	16.89 (4.58) ^a
MASC Separation Anxiety	6.72 (4.21)	6.40 (4.1) ^a	7.16 (4.42) ^b	6.10 (4.07) ^a	7.13 (4.21) ^b
MASC Total Anxiety	40.31 (14.25)	38.98 (14.89) ^a	41.66 (15.18) ^b	38.59 (13) ^a	41.66 (14.09) ^b
Diagnoses	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Any Diagnosis	166(40.2)	38(40.4) ^a	31(35.6) ^a	45(43.3) ^a	52(40.6) ^a
<u>Mood Disorders</u>					
Current Major Depressive Disorder [^]	7(1.7)	1(1.1)	1(1.1)	2(1.9)	3(2.3)
Lifetime Major Depressive Disorder	33(8.0)	8(8.5) ^a	5(5.7) ^a	7(6.7) ^a	13(10.2) ^a
Current Minor Depressive Disorder [^]	1(0.2)	0(0.0)	0(0.0)	0(0.0)	1 (0.8)
Lifetime Minor Depressive Disorder [^]	9(2.2)	1(1.1)	3(3.4)	2(1.9)	3(2.3)
Current Dysthymia/IDD [^]	4(1.0)	0(0.0)	1(1.1)	2(1.9)	1(0.8)
Lifetime Dysthymia/IDD [^]	7(1.7)	1(1.1)	2(2.3)	3(2.9)	1(0.8)
Current Episodic Depression	8(1.9)	1(1.1)	1(1.1)	2(1.9)	4(3.1)
Lifetime Episodic Depression	42(10.1)	9(9.6) ^a	8(9.2) ^a	9(8.7) ^a	16(12.5) ^a
Current Depression NOS [^]	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Lifetime Depression NOS [^]	1(0.2)	1(1.1)	0(0.0)	0(0.0)	0(0.0)
Any Current Depressive Disorder	12(2.9)	1(1.1) ^a	2(2.3) ^a	4(3.8) ^a	5(3.9) ^a
Any Lifetime Depressive Disorder	49(11.9)	11(11.7) ^a	10(11.5) ^a	12(11.5) ^a	16(12.5) ^a
Current Bipolar Spectrum Disorder [^]	1(0.2)	0(0.0)	0(0.0)	0(0.0)	1(0.8)
Lifetime Bipolar Spectrum Disorder [^]	3(0.7)	1(1.1)	0(0.0)	0(0.0)	2(1.6)

Symptoms	Full Sample (N=413) Mean(SD)	Caucasian Male (N=94) Mean(SD)	Caucasian Female (N=87) Mean(SD)	African American Male (N=104) Mean(SD)	African American Female (N=128) Mean(SD)
<u>Anxiety Disorders</u>					
Current Panic Disorder [^]	4(1.0)	1(1.1)	2(2.3)	0(0.0)	1(0.8)
Lifetime Panic Disorder [^]	7(1.7)	2(2.1)	4(4.6)	0(0.0)	1(0.8)
Current Agoraphobia [^]	7(1.7)	1(1.1)	1(1.1)	4(3.8)	1(0.8)
Lifetime Agoraphobia [^]	9(2.2)	2(2.1)	2(2.3)	4(3.8)	1(0.8)
Current Social Phobia	20(4.8)	3(3.2) ^a	5(5.7) ^a	5(4.8) ^a	7(5.5) ^a
Lifetime Social Phobia	21(5.1)	3(3.2) ^a	5(5.7) ^a	6(5.8) ^a	7(5.5) ^a
Current Specific Phobia	31(7.5)	5(5.3) ^a	4(4.6) ^a	8(7.7) ^a	14(10.9) ^a
Lifetime Specific Phobia	39(9.4)	8(8.5) ^a	5(5.7) ^a	9(8.7) ^a	17(13.3) ^a
Current OCD [^]	3(0.7)	0(0.0)	1(1.1)	1(1.0)	1(0.8)
Lifetime OCD [^]	3(0.7)	0(0.0)	1(1.1)	1(1.0)	1(0.8)
Current GAD	14(3.4)	3(3.2) ^a	6(6.9) ^a	3(2.9) ^a	2(1.6) ^a
Lifetime GAD	17(4.1)	4(4.3) ^a	6(6.9) ^a	3(2.9) ^a	4(3.1) ^a
Current Trauma [^]	5(1.2)	0(0.0)	1(1.1)	0(0.0)	4(3.1)
Lifetime Trauma [^]	9(2.2)	0(0.0)	3(3.4)	1(1.0)	5(3.9)
Current Separation Anxiety [^]	6(1.5)	1(1.1)	2(2.3)	2(1.9)	1(0.8)
Lifetime Separation Anxiety	25(6.1)	8(8.5) ^a	6(6.9) ^a	7(6.7) ^b	4(3.1) ^b
Any Current Anxiety Disorder	63(15.3)	11(11.7) ^a	16(18.4) ^a	16(15.4) ^a	20(12.6) ^a
Any Lifetime Anxiety Disorder	82(19.9)	18(19.1) ^a	18(20.7) ^a	20(19.2) ^b	26(20.3) ^b
<u>Externalizing Disorders</u>					
Lifetime ADHD	73(17.7)	21(22.3) ^{ac}	11(12.6) ^{bc}	26(25.0) ^{ad}	15(11.7) ^{bd}
Lifetime Conduct Disorder	11(2.7)	2(2.1) ^a	0(0) ^a	5(4.8) ^a	4(3.1) ^a
Current Oppositional Defiant Disorder	20(4.80)	6(6.4) ^a	4(4.6) ^a	2(1.9) ^b	8(6.3) ^b
Lifetime Oppositional Defiant Disorder	25(6.1)	7(7.4) ^a	5(5.7) ^a	4(3.8) ^b	9(7.0) ^b
Current Disruptive Behavior Disorders	30(7.3)	8(8.5) ^a	4(4.6) ^a	7(6.7) ^a	11(8.6) ^a
Any Lifetime Disruptive Behavior Disorder	34(8.2)	8(8.5) ^a	5(5.7) ^a	9(8.7) ^a	12(9.4) ^a

Symptoms	Full Sample (N=413) Mean(SD)	Caucasian Male (N=94) Mean(SD)	Caucasian Female (N=87) Mean(SD)	African American Male (N=104) Mean(SD)	African American Female (N=128) Mean(SD)
Any Lifetime Externalizing Disorder	86(20.8)	23(24.5) ^a	13(14.9) ^a	28(26.9) ^b	22(17.2) ^b
Lifetime Psychosis ^a	6(1.5)	0(0.0)	2(2.3)	1(1.0)	3(2.3)

^a indicates diagnosis was not included in further analyses due to low frequency, thus superscripts are not included for these diagnostic categories
^{abcd} Different superscripts indicate significant ($p < .05$) main effect differences by gender and/or race; the same superscript indicates no significant difference between values. There were no race by gender interactions in symptoms or diagnoses.

Note: IDD = Intermittent Depressive Disorder; NOS = Not Otherwise Specified; OCD = Obsessive Compulsive Disorder; GAD = Generalized Anxiety Disorder; Trauma = Posttraumatic Stress Disorder and Acute Stress Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; Disruptive Behavior Disorders = Oppositional Defiant Disorder & Conduct Disorder; Externalizing Disorders = ADHD, Oppositional Defiant Disorder & Conduct Disorder.

Table 2

Means (SDs) and Frequencies of Cognitive Vulnerability Variables

	Full Sample (N=413) Mean(SD)	Caucasian Male (N=94) Mean(SD)	Caucasian Female (N=87) Mean(SD)	African American Male (N=104) Mean(SD)	African American Female (N=128) Mean(SD)
ACSQ					
Overall NegComp	13.64 (3.86)	14.58(3.57) ^a	13.62(3.76) ^a	13.25 (3.95) ^b	13.26(3.99) ^b
Overall Int	4.10 (1.21)	4.31(1.20) ^a	4.16(1.17) ^a	4.03 (1.26) ^b	3.94(1.26) ^b
Overall Glo	2.67 (.99)	2.80(.90) ^a	2.66(1.04) ^a	2.62 (1.06) ^a	2.63(.96) ^a
Overall Sta	2.70 (.96)	2.96(1.00) ^a	2.77(.95) ^a	2.51 (.93) ^b	2.61 (.93) ^b
Overall Con	2.26 (.92)	2.49(.90) ^a	2.14(.83) ^b	2.22 (.89) ^a	2.19(.99) ^b
Overall Self	1.92 (.97)	1.92(.97) ^a	1.87(.97) ^a	1.96 (.99) ^a	1.81(.95) ^a
App NegComp	9.23(3.52)	9.20(3.47) ^a	9.36(3.53) ^a	8.74(3.44) ^a	9.56(3.60) ^a
Inter NegComp	9.24(3.14)	9.55(3.31) ^a	9.83(3.43) ^a	8.75(2.91) ^b	9.05(2.95) ^b
Ach NegComp	9.44(3.04)	9.56(3.27) ^a	9.64(3.08) ^a	9.23(3.03) ^a	9.37(2.88) ^a
WkLk	3.20(.97)	3.45(.91) ^a	3.18(1.00) ^a	3.10 (.96) ^b	3.09 (.99) ^b
CHS	3.28(2.47)	3.57(2.96) ^a	3.35(2.25) ^a	3.94(2.05) ^a	3.20(2.55) ^a
CRSQ					
Rumination	23.84(7.65)	22.42(7.62) ^a	25.56(8.35) ^b	23.48(7.44) ^a	23.93(7.22) ^b
Distraction	15.41(3.55)	15.51(3.46) ^a	15.56(3.86) ^a	15.80(3.45) ^a	14.96(3.46) ^a
Problem Solving	11.29(3.48)	10.46(3.51) ^a	11.37(3.56) ^a	11.63(3.11) ^a	11.50(3.64) ^a
SRET					
#NEG me	2(2.04)	1.56(1.42) ^a	2.45(2.32) ^a	1.97(1.82) ^a	1.97(2.25) ^a
#POS me	9.12(3.21)	8.81(3.33) ^a	9.73(3.98) ^a	9.39(2.83) ^a	8.71(2.95) ^a
Ratio NEG/Tot SelfRef Recall	0.45(0.21)	0.44(0.24) ^a	0.47(0.18) ^a	0.42(0.21) ^a	0.47(0.21) ^a
Overall Corr Recall	9.65(4.25)	8.43(4.30) ^a	10.37(3.92) ^b	9.38(4.48) ^a	10.21(4.06) ^b
NEG me RT	1959.7(742.91)	2019.98(883.29) ^a	1929.31(750.70) ^a	1999.79(747.87) ^a	1918.41(678.8) ^a
POS me RT	2009.65(780.7)	2036.10(843.45) ^a	1972.37(737.10) ^a	2027.22(790.2) ^a	2004.7(786.69) ^a

^{abcd} Different superscripts indicate significant ($p < .05$) main effect differences by gender and/or race; the same superscript indicates no significant difference between values. There were no race x gender interactions on the cognitive vulnerability measures.

Note: Adolescent Cognitive Style Questionnaire Subscales: ACSQ Overall NegComp = Overall negative composite subscale; ACSQ Overall Int = Overall internality subscale; ACSQ Overall Glo = Overall globality subscale; ACSQ Overall Sta = Overall stability subscale; ACSQ Overall Con = Overall consequences subscale; ACSQ Overall Self = Overall self subscale; ACSQ Ach NegComp = Achievement events negative composite subscale; ACSQ App NegComp = Appearance events negative composite subscale; ACSQ Inter NegComp = Interpersonal events negative composite subscale; ACSQ WkLk = Weakest Link subscale: Reflects the individual's most negative cognitive style subscale score on the ACSQ; CHS: Total score on the Children's Hopelessness Scale; Children's Response Style Questionnaire Subscales: CRSQ Distraction = Total score on the distraction subscale; CRSQ Problem Solving = Total score on the problem solving subscale; CRSQ Rumination = Total score on the rumination subscale; Self-Referent Encoding Task Subscales: SRET # NEG me = Number of negative words to which participants answered "like me"; SRET #POS me = Number of positive words to which participants answered "like me"; SRET Ratio NEG/Tot SelfRef Recall = Ratio of correctly recalled negative self-referent words to the total number of self-referent words; SRET Overall Corr Recall = Total number of correctly recalled words (positive and negative, self-referent and not); SRET NEG me RT = Response time for negative words to which participants answered "like me"; SRET POS me RT = Response time for positive words to which participants answered "like me".

Table 3

Correlations between Cognitive Vulnerability Variables and Symptoms

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 CDI - Total	-	.56***	.42***	-.11*	.07	.37***	.29***	.24***	.25***	.17**	.15**	.15**	.07	.17**	.14**	.15**	.45***	.50***	-.14**	-.13**	.56***	-.25***	-.08	-.05	.05	.03
2 MASC - Physical Symptoms		-	.49***	.11*	.31***	.72***	.26***	.22***	.23***	.18**	.12*	.14**	.08	.18***	.16**	.16**	.28***	.48***	.00	.04	.32***	-.20*	-.08	-.07	-.01	.00
3 MASC - Social Anxiety			-	.22***	.43***	.79***	.34***	.33***	.30***	.25**	.18***	.20***	.14**	.20***	.23***	.21***	.25***	.38***	-.07	-.09	.21**	-.25***	.00	-.01	.08	.05
4 MASC - Harm Avoidance				-	.39***	.56***	.02	.06	.02	0.01	.04	.01	.01	-.01	.00	-.03	-.14**	.14**	.25***	.31***	-.05	.06	.00	-.10*	.05	.15
5 MASC - Separation Anxiety					-	.72***	.07	.08	.16**	.13*	.12*	.09	.10	.09	.13**	.11*	.00	.23***	.03	.06	.06	-.09	.00	-.02	.09	.05
6 MASC - Total						-	.27***	.26***	.27***	.21***	.17**	.17**	.12*	.17***	.20***	.18**	.17**	.46***	.06	.09*	.21**	-.19*	-.03	-.07	.07	.08
7 ACSQ - Achievement							-	.65***	.73***	.56***	.25***	.44***	.46***	.51***	.38***	.54***	.11*	.32***	-.02	-.03	.18*	-.17	-.02	.01	-.04	-.04
8 ACSQ - Appearance								-	.72***	.47***	.19***	.54***	.39***	.42***	.38***	.42***	.16**	.54***	-.02	.00	.14	-.21	-.05	.02	-.06	-.07
9 ACSQ - Interpersonal									-	.60***	.21***	.49***	.48***	.52***	.45***	.52***	.13**	.54***	.00	-.01	.05	-.12	-.01	.04	.04	.01
10 ACSQ - Overall Negative Composite										-	0.47***	0.83***	0.80***	0.87***	0.75***	0.91***	.050	0.27***	.020	-.030	.120	-.140	-.010	.030	-.010	-.020
11 ACSQ - Internal											-	.38***	.44***	.36***	.33***	.47***	-.03	.20***	.07	-.01	.04	-.03	-.02	.06	-.14	-.08
12 ACSQ - Global												-	.60***	.67***	.40***	.80***	.03	.22***	.06	.01	.20*	-.11	.00	.04	.00	-.02
13 ACSQ - Stable													-	.57***	.42***	.82***	-.02	.15**	.01	-.05	.10	-.05	.01	.03	.02	.02
14 ACSQ - Consequences														-	.59***	.73***	.06	.23***	.02	-.01	.10	-.14	-.02	-.03	.00	-.01
15 ACSQ - Self															-	.59***	.09	.25***	-.03	-.08	.02	-.17*	.00	.04	-.03	-.05
16 ACSQ - Weakest Link																-	.03	.24***	.04	-.05	.15	-.10	-.04	.03	.05	.03
17 CHS - Total																	-	.26***	-.13**	-.15**	.35***	-.28***	-.02	.04	-.08	-.11
18 CRSQ - Rumination																		-	.01	.13**	.36***	-.22**	.03	.00	.00	.01
19 CRSQ - Distraction																			-	.45***	-.13	.09	.01	-.10*	.08	.12
20 CRSQ - Problem Solving																				-	-.12	.12	.08	-.07	-.03	.05
21 SRET - #NEG me																					-	.04	-.02	-.03	.14	.13
22 SRET - #POS me																						-	.00	-.10	.58***	.57
23 SRET - Ratio NEG/Tot SelfRef Recall																							-	.10*	.04	.01
24 SRET - Overall Correct Recall																								-	.32***	-.30***
25 SRET - NEG me RT																									-	.84***
26 SRET - POS me RT																										-

*
p < .05,

p< .01,

p< .001.

Note: Adolescent Cognitive Style Questionnaire Subscales: ACSQ Overall Negative Composite = Overall negative composite subscale; ACSQ Internal = internality subscale; ACSQ Overall Globality = globality subscale; ACSQ Overall Stability = stability subscale; ACSQ Con = consequences subscale; ACSQ Overall Self = self subscale; ACSQ Achievement = Achievement events negative composite subscale; ACSQ Interpersonal = Interpersonal events negative composite subscale; ACSQ Weakest Link = Weakest Link subscale; Reflects the individual's most negative cognitive style subscale score on the ACSQ; CHS - Total: Total score on the Children's Hopelessness Scale; Children's Response Style Questionnaire Subscales: CRSQ Distraction = Total score on the distraction subscale; CRSQ Problem Solving = Total score on the problem solving subscale; CRSQ Rumination = Total score on the rumination subscale; Self-Referent Encoding Task Subscales: SRET # NEG me = Number of negative words to which participants answered "like me"; SRET #POS me = Number of positive words to which participants answered "like me"; SRET Ratio NEG/Tot SelfRef Recall = Ratio of correctly recalled negative self-referent words to the total number of self-referent words; SRET Overall Corr Recall = Total number of correctly recalled words (positive and negative, self-referent and not); SRET NEG me RT = Response time for negative words to which participants answered "like me"; SRET POS me RT = Response time for positive words to which participants answered "like me".

Table 4

Comorbidity for Current Diagnostic Categories

Diagnostic Category	Any Anx	Specific Pho	GAD	ADHD	Any DBD	ODD
Any Dep	50.0% P<.01	25.0% P=.05	8.3% P=.34	50.0% P=.01	33.3% P<.01	16.7% P=.11
Any Anx		N/A	N/A	34.9% P<.01	15.9% P<.01	11.1% P=.02
Specific Pho			9.7% P=.08	22.6% P=.30	19.4% P=.02	12.9% P=.05
GAD				35.7% P=.08	7.1% P=.73	7.1% P=.51
ADHD					23.3% P<.01	15.1% P<.01
Any DBD						N/A

Note: The % listed in the table represents the % of adolescents with diagnosis X (row) who also have diagnosis Y (column).

Fisher's exact test of independence. Values in bold indicate a significant association between diagnoses (p<.05).

Please note that the test statistic is based on the 2x2 matrix of both those who DO and DON'T have X diagnosis; thus, identical %s in a row can have different P values. That means there was a different proportion of those without diagnosis X who have diagnosis Y, which changes the test statistic but isn't visible in the table. Dep = Depression; Any Anx = Any Anxiety Disorder; Pho = Phobia; GAD = Generalized Anxiety Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; ODD = Oppositional Defiant Disorder; DBD = Disruptive Behavior Disorders (i.e. ODD & Conduct Disorder)

Table 5

Comorbidity for Lifetime Diagnostic Categories

Diagnostic Category	Any Anx	SAD	Specific Pho	Social Pho	GAD	Any Ext	ADHD	Any DBD	ODD	CD
Any Dep	38.8% P<.01	12.2% P=.06	18.4% P=.03	12.2% P=.03	12.2% P<.01	36.7% P<.01	34.7% P<.01	12.2% P=.20	8.2% P=.34	6.1% P=.13
MDD	36.4% P=.02	12.1% P=.13	15.2% P=.19	12.1% P=.08	12.1% P=.04	27.3% P=.23	24.2% P=.20	9.1% P=.53	6.1% P=.61	3.0% P=.61
Epis Dep	35.7% P<.01	11.9% P=.10	14.3% P=.19	9.5% P=.15	11.9% P=.02	33.3% P=.03	31.0% P=.02	11.9% P=.26	9.5% P=.24	4.8% P=.31
Any Anx		N/A	N/A	N/A	N/A	34.1% P<.01	30.5% P<.01	15.9% P<.01	12.2% P=.02	4.9% P=.24
SAD			20.0% P=.08	20.0% P<.01	20.0% P<.01	36.0% P=.05	32.0% P=.06	24.0% P=.01	20.0% P=.01	4.0% P=.50
Specific Pho				15.4% P<.01	15.4% P<.01	28.2% P=.16	20.5% P=.38	15.4% P=.09	10.3% P=.20	5.1% P=.28
Social Pho					14.3% P=.05	38.1% P=.05	38.1% P=.02	14.3% P=.24	9.5% P=.37	4.8% P=.44
GAD						35.3% P=.12	35.3% P=.06	5.9% P=.56	5.9% P=.73	2.8% P=.63
Any Ext							N/A	N/A	N/A	N/A
ADHD								28.8% P<.01	21.9% P<.01	9.6% P<.01
Any DBD									N/A	N/A
ODD										8.0% P=.14

Note: The % listed in the table represents the % of adolescents with diagnosis X (row) who also have diagnosis Y (column).

Fisher's exact test of independence. Values in bold indicate a significant association between diagnoses ($p<.05$).

Please note that the test statistic is based on the 2x2 matrix of both those who DO and DON'T have X diagnosis; thus, identical %s in a row can have different P values. That means there was a different proportion of those without diagnosis X who have diagnosis Y, which changes the test statistic but isn't visible in the table. Dep = Depression; MDD = Major Depressive Disorder; Epis Dep = Episodic Depressive Disorder; Any Anx = Any Anxiety Disorder; SAD = Separation Anxiety Disorder; Pho = Phobia; GAD = Generalized Anxiety Disorder; ADHD = Attention-Deficit/Hyperactivity Disorder; ODD = Oppositional Defiant Disorder; Any Ext = Externalizing (i.e., ADHD, ODD, & Conduct Disorder); DBD = Disruptive Behavior Disorders (i.e. ODD & Conduct Disorder).

Table 6

Linear Regression Analysis Summary of the Association Between Cognitive Vulnerability Measures and Current Mood Symptoms Controlling for Demographics and the other Symptom Type

Cognitive Vulnerability	CDI Total Score				MASC Total Score				MASC Physical Symptoms			
	B	SEB	β	<i>t</i>	B	SEB	β	<i>t</i>	B	SEB	β	<i>t</i>
ACSQ												
Overall NegComp	0.20	0.10	0.10	2.04*	0.69	0.22	0.16	3.22**				
Overall Int					1.44	0.56	0.12	2.58*				
Overall Glo	0.60	0.30	0.10	2.01*	1.65	0.68	0.12	2.44*				
Overall Sta					1.60	0.71	0.11	2.26*				
Overall Con	0.80	0.32	0.12	2.49*	1.86	0.73	0.12	2.53*				
Overall Self					2.32	0.70	0.16	3.32*	0.49	0.25	0.08	1.96*
App NegComp	0.26	0.09	0.15	2.99***	0.74	0.19	0.19	3.83***	0.15	0.07	0.10	2.19*
Inter NegComp	0.32	0.10	0.16	3.16**	0.87	0.22	0.20	4.00***	0.18	0.08	0.10	2.29*
Ach NegComp	0.40	0.10	0.20	4.07***	0.81	0.23	0.18	3.58***	0.20	0.08	0.11	2.43*
WkLk					1.76	0.71	0.12	2.47*				
CHS												
	1.02	0.11	0.40	9.41***								
CRSQ												
Rumination	0.33	0.04	0.41	8.39***	0.67	0.10	0.36	6.94***	0.21	0.04	0.28	5.87***
Distraction	-0.28	0.08	-0.16	-3.43**	0.47	0.20	0.12	2.41*	0.13	0.07	0.08	1.92*
Problem Solving	-0.31	0.08	-0.17	-3.69***	0.59	0.20	0.14	3.02**	0.18	0.07	0.11	2.63**
SRET												
#NEG me	1.63	0.20	0.48	8.01***								
#POS me	-0.42	0.16	-0.19	-2.63**								
Ratio NEG/Tot SelfRef Recall												
Overall Corr Recall												
NEG me RT												
POS me RT												

Cognitive Vulnerability	MASC Social Anxiety Symptoms				MASC Harm Avoidance				MASC Separation Anxiety Symptoms			
	B	SEB	β	<i>t</i>	B	SEB	β	<i>t</i>	B	SEB	β	<i>t</i>
ACSQ												
Overall NegComp	0.33	0.08	0.19	3.99***					0.17	0.07	0.13	2.42*
Overall Int	0.59	0.22	0.13	2.70*					0.44	0.18	0.13	2.48*
Overall Glo	0.81	0.26	0.14	3.08**								
Overall Sta	0.76	0.27	0.13	2.77**					0.49	0.23	0.11	2.14*
Overall Con	0.89	0.29	0.15	3.10**								
Overall Self	1.10	0.27	0.19	4.09***					0.63	0.22	0.15	2.83**
App NegComp	0.39	0.08	0.24	5.14***								
Inter NegComp	0.39	0.09	0.22	4.46***					0.22	0.07	0.16	3.04**
Ach NegComp	0.44	0.09	0.24	4.98***								
WKLk	0.90	0.28	0.16	3.19**					0.48	0.23	0.11	2.06*
CHS												
CRSQ												
Rumination	0.17	0.04	0.22	4.18***	0.16	0.03	0.27	4.72***	0.14	0.03	0.26	4.42***
Distraction					0.30	0.06	0.24	4.72***				
Problem Solving					0.40	0.06	0.31	6.30***				
SRET												
#NEG me												
#POS me	-0.31	0.15	-0.15	2.07*								
Ratio NEG/Tot.SelfRef Recall												
Overall Corr Recall					-0.11	0.05	-0.11	-2.08*				
NEG me RT												
POS me RT												

*
p < .05,
**
p < .01,

p < .001.

Note: All control variables are omitted from the table. Only significant cognitive vulnerability effects are presented. CDI = Children's Depression Inventory; MASC = Multidimensional Anxiety Scale for Children; Adolescent Cognitive Style Questionnaire Subscales: ACSQ Overall NegComp = Overall negative composite subscale; ACSQ Overall Int = Overall internality subscale; ACSQ Overall Glo =

Overall globality subscale; ACSQ Overall Sta = Overall stability subscale; ACSQ Overall Con = Overall consequences subscale; ACSQ Overall Self = Overall self subscale; ACSQ Ach NegComp = Achievement events negative composite subscale; ACSQ App NegComp = Appearance events negative composite subscale; ACSQ Inter NegComp = Interpersonal events negative composite subscale; ACSQ WLLk = Weakest Link subscale: Reflects the individual's most negative cognitive style subscale score on the ACSQ; (note: ACSQ Total NegComp, ACSQ Overall Int, ACSQ Overall Glo, ACSQ Overall Sta, ACSQ Overall Con, and ACSQ Overall Self do not include appearance domain items); CHS: Total score on the Children's Hopelessness Scale; Children's Response Style Questionnaire Subscales: CRSQ Distraction = Total score on the distraction subscale; CRSQ Problem Solving = Total score on the problem solving subscale; CRSQ Rumination = Total score on the rumination subscale; Self-Referent Encoding Task Subscales: SRET # NEG me = Number of negative words to which participants answered "like me"; SRET #POS me = Number of positive words to which participants answered "like me"; SRET Ratio NEG/Tot SelfRef Recall = Ratio of correctly recalled negative self-referent words to the total number of self-referent words; SRET Overall Corr Recall = Total number of correctly recalled words (positive and negative, self-referent and not); SRET NEG me RT = Response time for negative words to which participants answered "like me"; SRET POS me RT = Response time for positive words to which participants answered "like me".

Logistic Regression Analysis Summary of the Associations Between Cognitive Vulnerability Measures and Current Diagnoses Controlling for Comorbid Current Diagnoses

Table 7

Cognitive Vulnerability	Current Diagnoses	B	SE	Wald	df	sig	OddsRatio	LowerCI	UpperCI
ACSQ									
Overall NegComp									
Overall Int									
Overall Glo									
Overall Sta	Oppositional Defiant Disorder	0.60	0.28	4.71	1	0.03	1.83	1.06	3.15
Overall Sta	Disruptive Behavior	0.61	0.23	6.68	1	0.01	1.84	1.16	2.91
Overall Con	Any Anxiety Diagnosis	1.23	0.57	4.73	1	0.03	3.42	1.13	10.35
Overall Self									
App NegComp	Social Phobia	0.14	0.07	4.52	1	0.03	1.15	1.01	1.31
Inter NegComp	Social Phobia	0.18	0.07	6.60	1	0.01	1.20	1.04	1.38
Ach NegComp	Social Phobia	0.24	0.09	7.34	1	0.01	1.27	1.07	1.51
WkLk	Disruptive Behavior	0.45	0.23	3.83	1	0.05	1.57	1.00	2.46
WkLk	Social Phobia	0.50	0.24	4.39	1	0.04	1.65	1.03	2.63
CHS	Any Depression Diagnosis	0.18	0.09	4.00	1	0.05	1.20	1.00	1.43
CRSQ									
Rumination	Any Depression Diagnosis	0.09	0.04	4.46	1	0.04	1.09	1.01	1.18
Distraction									
Problem solving									
SRET									
#NEG me									
#POS me									
Ratio NEG/Tot SelfRef Recall									
Overall Corr Recall									
NEG me RT	Disruptive Behavior	0.00	0.00	3.90	1	0.05	1.00	1.00	1.00
POS me RT									

* p < .05,

** p < .01,

p< .001.

Note: All control variables are omitted from the table. Only significant cognitive vulnerability effects are presented. Adolescent Cognitive Style Questionnaire Subscales: ACSQ Overall NegComp = Overall negative composite subscale; ACSQ Overall Int = Overall internality subscale; ACSQ Overall Glo = Overall globality subscale; ACSQ Overall Sta = Overall stability subscale; ACSQ Overall Con = Overall consequences subscale; ACSQ Overall Self = Overall self subscale; ACSQ Ach NegComp = Achievement events negative composite subscale; ACSQ App NegComp = Appearance events negative composite subscale; ACSQ Inter NegComp = Interpersonal events negative composite subscale; ACSQ WkLk = Weakest Link subscale; Reflects the individual's most negative cognitive style subscale score on the ACSQ; (note: ACSQ Total NegComp, ACSQ Overall Int, ACSQ Overall Glo, ACSQ Overall Con, and ACSQ Overall Self do not include appearance domain items); CHS: Total score on the Children's Hopelessness Scale; Children's Response Style Questionnaire Subscales: CRSQ Distraction = Total score on the distraction subscale; CRSQ Problem Solving = Total score on the problem solving subscale; CRSQ Rumination = Total score on the rumination subscale; Self-Referent Encoding Task Subscales: SRET # NEG me = Number of negative words to which participants answered "like me"; SRET #POS me = Number of positive words to which participants answered "like me"; SRET Ratio NEG/Tot SelfRef Recall = Ratio of correctly recalled negative self-referent words to the total number of self-referent words; SRET Overall Corr Recall = Total number of correctly recalled words (positive and negative, self-referent and not); SRET NEG me RT = Response time for negative words to which participants answered "like me"; SRET POS me RT = Response time for positive words to which participants answered "like me".

Table 8

Logistic Regression Analysis Summary of the Associations Between Cognitive Vulnerability Measures and Lifetime Diagnoses Controlling for Comorbid Lifetime Diagnoses

Cognitive Vulnerability	Lifetime Diagnoses	B	SE	Wald	df	sig	OddsRatio	LowerCI	UpperCI
ACSQ									
Overall NegComp	Any Diagnoses	0.09	0.03	6.25	1	0.01	1.09	1.02	1.17
Overall NegComp	Externalizing Behavior	0.10	0.04	5.68	1	0.02	1.11	1.02	1.20
Overall Int									
Overall Glo									
Overall Sta									
Overall Con	Any Diagnoses	0.34	0.12	8.61	1	0.00	1.41	1.12	1.77
Overall Con	Attention Deficit Hyperactive Disorder	0.32	0.15	4.43	1	0.04	1.38	1.02	1.86
Overall Con	Externalizing Behavior	0.44	0.14	10.11	1	0.00	1.56	1.18	2.05
Overall Con	Episodic Depression	0.34	0.17	3.86	1	0.05	1.41	1.00	1.98
Overall Self	Any Diagnoses	0.28	0.11	6.91	1	0.01	1.33	1.07	1.64
Overall Self	Conduct Disorder	0.56	0.27	4.46	1	0.03	1.76	1.04	2.97
Overall Self	Externalizing Behavior	0.28	0.13	4.71	1	0.03	1.32	1.03	1.70
Overall Self	Episodic Depression	0.31	0.16	3.86	1	0.05	1.37	1.00	1.87
App NegComp	Social Phobia Diagnosis	0.14	0.07	4.41	1	0.04	1.15	1.01	1.31
Inter NegComp	Social Phobia Diagnosis	0.18	0.07	6.43	1	0.01	1.20	1.04	1.38
Ach NegComp	Social Phobia Diagnosis	0.20	0.08	6.06	1	0.01	1.22	1.04	1.43
WkLk	Externalizing Behavior	0.32	0.15	4.68	1	0.03	1.38	1.03	1.84
CHS									
CRSQ									
Rumination	Any Diagnosis	0.03	0.01	5.47	1	0.02	1.03	1.01	1.06
Rumination	Any Depression Diagnosis	0.05	0.02	4.46	1	0.04	1.05	1.00	1.09
Rumination	Episodic Depression	0.04	0.02	3.55	1	0.06	1.04	1.00	1.09
Rumination	Generalized Anxiety Disorder	0.07	0.03	4.91	1	0.03	1.08	1.01	1.15
Distraction	Separation Anxiety Disorder	-0.22	0.07	9.63	1	0.00	0.80	0.69	0.92
Distraction	Any Anxiety Diagnosis	-0.09	0.04	4.97	1	0.03	0.92	0.85	0.99
Problem Solving									
SRET									

Cognitive Vulnerability	Lifetime Diagnoses	B	SE	Wald	df	sig	OddsRatio	LowerCI	UpperCI
#NEG me	Any Diagnosis	0.20	0.08	5.47	1	0.02	1.22	1.03	1.44
#NEG me	Social Phobia Diagnosis	0.34	0.15	5.04	1	0.03	1.40	1.04	1.88
#POS me	Separation Anxiety Disorder	0.36	0.15	5.45	1	0.02	1.43	1.06	1.92
Ratio NEG/Tot SelfRef Recall	Disruptive Behavior	1.94	1.01	3.68	1	0.06	6.95	0.96	50.28
Overall Corr Recall	Any Diagnosis	-0.06	0.03	5.29	1	0.02	0.94	0.89	0.99
Overall Corr Recall	Externalizing Disorders	-0.06	0.03	3.61	1	0.06	0.94	0.88	1.00
NEG me RT	Major Depressive Disorder	0.00	0.00	3.65	1	0.06	1.00	1.00	1.00
NEG me RT	Disruptive Behavior	0.00	0.00	4.28	1	0.04	1.00	1.00	1.00
NEG me RT	Conduct Disorder	0.00	0.00	4.09	1	0.04	1.00	1.00	1.00
POS me RT	Generalized Anxiety Disorder	0.00	0.00	3.61	1	0.06	1.00	1.00	1.00

* p < .05,

** p < .01,

*** p < .001.

Note: All control variables are omitted from the table. Only significant cognitive vulnerability effects are presented. Adolescent Cognitive Style Questionnaire Subscales: ACSQ Overall NegComp = Overall negative composite subscale; ACSQ Overall Int = Overall internality subscale; ACSQ Overall Glo = Overall globality subscale; ACSQ Overall Sta = Overall stability subscale; ACSQ Overall Con = Overall consequences subscale; ACSQ Overall Self = Overall self subscale; ACSQ Ach NegComp = Achievement events negative composite subscale; ACSQ App NegComp = Appearance events negative composite subscale; ACSQ Inter NegComp = Interpersonal events negative composite subscale; ACSQ Wldk = Weakest Link subscale; Reflects the individual's most negative cognitive style subscale score on the ACSQ; (note: ACSQ Total NegComp, ACSQ Overall Int, ACSQ Overall Glo, ACSQ Overall Con, and ACSQ Overall Self do not include appearance domain items); CHS: Total score on the Children's Hopelessness Scale; Children's Response Style Questionnaire Subscales: CRSQ Distraction = Total score on the distraction subscale; CRSQ Problem Solving = Total score on the problem solving subscale; CRSQ Rumination = Total score on the rumination subscale; Self-Referent Encoding Task Subscales: SRET # NEG me = Number of negative words to which participants answered "like me"; SRET #POS me = Number of positive words to which participants answered "like me"; SRET Ratio NEG/Tot SelfRef Recall = Ratio of correctly recalled negative self-referent words to the total number of self-referent words; SRET Overall Corr Recall = Total number of correctly recalled words (positive and negative, self-referent and not); SRET NEG me RT = Response time for negative words to which participants answered "like me"; SRET POS me RT = Response time for positive words to which participants answered "like me".