

# Responses to Depression in Children: Reconceptualizing the Relation Among Response Styles

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**Abstract** We propose that researchers should utilize ratio scores when examining the response styles theory rather than examine each of the response styles separately. Higher ratio scores indicate a higher probability of engaging in ruminative, as opposed to distracting and problem solving, behaviors. In Phase One, we examined the factor structure and reliability of the Children's Response Styles Questionnaire (CRSQ) in a sample of 287 third through sixth grade schoolchildren. A two factor solution was obtained: (1) Rumination and (2) Distraction and Problem Solving. Both factors exhibited strong psychometric properties. In Phase Two, 140 children completed the CRSQ and the Children's Depression Inventory (CDI). Six weeks later, children completed the CDI. Confirmatory factor analysis indicated that the two-factor solution fit the data well. In line with hypotheses, CRSQ ratio scores were more strongly associated with CDI residual change scores than were either CRSQ rumination or distraction and problem solving scores.

**Keywords** Response styles theory · Rumination · Distraction · Problem-solving · Depression

Most individuals will experience depressive symptoms at some point during their lives. However, only a minority of individuals will develop severe, long-lasting symptoms. In order to explain why certain individuals are vulnerable to depression, researchers have proposed numerous theories outlining factors contributing to the etiology and maintenance

of depression. One such theory is the response styles theory (Nolen-Hoeksema 1987, 1991).

## Response Styles Theory

The response styles theory (Nolen-Hoeksema 1987, 1991) proposes that the way an individual responds to depressive symptoms influences both the severity and duration of their symptoms. The theory posits three such response styles: rumination, distraction and problem-solving. Rumination is hypothesized to increase, whereas distraction and problem-solving are hypothesized to decrease, the severity and duration of depressive symptoms.

Rumination involves focusing passively and repetitively on depressive symptoms and on their implications. In doing so, individuals do not actively take steps to reduce their symptoms or to correct the problems that they have identified. Although individuals often engage in rumination believing that it will enhance self-understanding and alleviate negative mood, in reality, rumination often increases depressive symptoms. Problem-solving involves actively attempting to solve one's problems or to change unfavorable life situations. Such a response is hypothesized to be an optimal long-term strategy for reducing depressive symptoms. However, problem-solving skills may be hindered by the negative cognitive biases accompanying depression. Consequently, distraction may be a superior short-term method for reducing depressive symptoms. Distraction involves engaging in pleasurable, positively reinforcing activities in order to divert attention away from depressive symptoms. Such activities are proposed to provide an opportunity for positive reinforcement, which ultimately functions to reduce depressed mood. Furthermore, distraction encourages the suspension of self-contemplation until depressive symptoms have lifted, thereby preventing

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depressed mood from negatively biasing cognitions. Thus, engaging in distraction followed by problem-solving may be the ideal technique for reducing depressive symptoms (Nolen-Hoeksema 1991, p. 575).

Although a large number of studies have examined the response styles theory in adults (e.g., Just and Alloy 1997; Nolen-Hoeksema and Harrell 2002; Nolen-Hoeksema and Morrow 1991; Sarin et al. 2005), only three cross-sectional studies (Abela et al. 2004; Broderick 1998; Ziegert and Kistner 2002) and one prospective study (Abela et al. 2002a) have examined the theory in children and early adolescents. With respect to the theory's vulnerability hypothesis, a ruminative response style has been found to be associated with depressive symptoms (Abela et al. 2002a, 2004; Broderick 1998; Ziegert and Kistner 2002) and to predict increases in depressive symptoms over time (Abela et al. 2002a) in children and early adolescents. Results with respect to distraction and problem solving, however, have been mixed. Although some studies have reported an association between a distractive response style and lower levels of depressive symptoms (Abela et al. 2004, seventh-graders; Ziegert and Kistner 2002), other studies have reported no association (Abela et al. 2002a, 2004, third-graders). In addition, although studies utilizing early adolescent samples have reported an association between problem-solving and lower levels of depressive symptoms, studies utilizing child samples have reported no association (Abela et al. 2002a, 2004). Last, neither distraction nor problem-solving have been found to predict change in depressive symptoms over time in children and early adolescents (Abela et al. 2002a).

### Examining the Relations Among the Response Styles

Past research testing the response styles theory has examined rumination, distraction, and/or problem solving separately without considering the possible relations among them. Such an approach is based on the assumption that individuals consistently use one, and only one, response style and therefore that the response styles are inversely related. In other words, when hypothesizing that individuals with a ruminative response style will exhibit increases in depressive symptoms over time, past research has implicitly assumed that these individuals will refrain from engaging in both distractive and problem solving responses. Similarly, in hypothesizing that individuals with distractive and/or problem solving response style will exhibit decreases in depressive symptoms over time, past research has implicitly assumed that these individuals will refrain from engaging in ruminative responses.

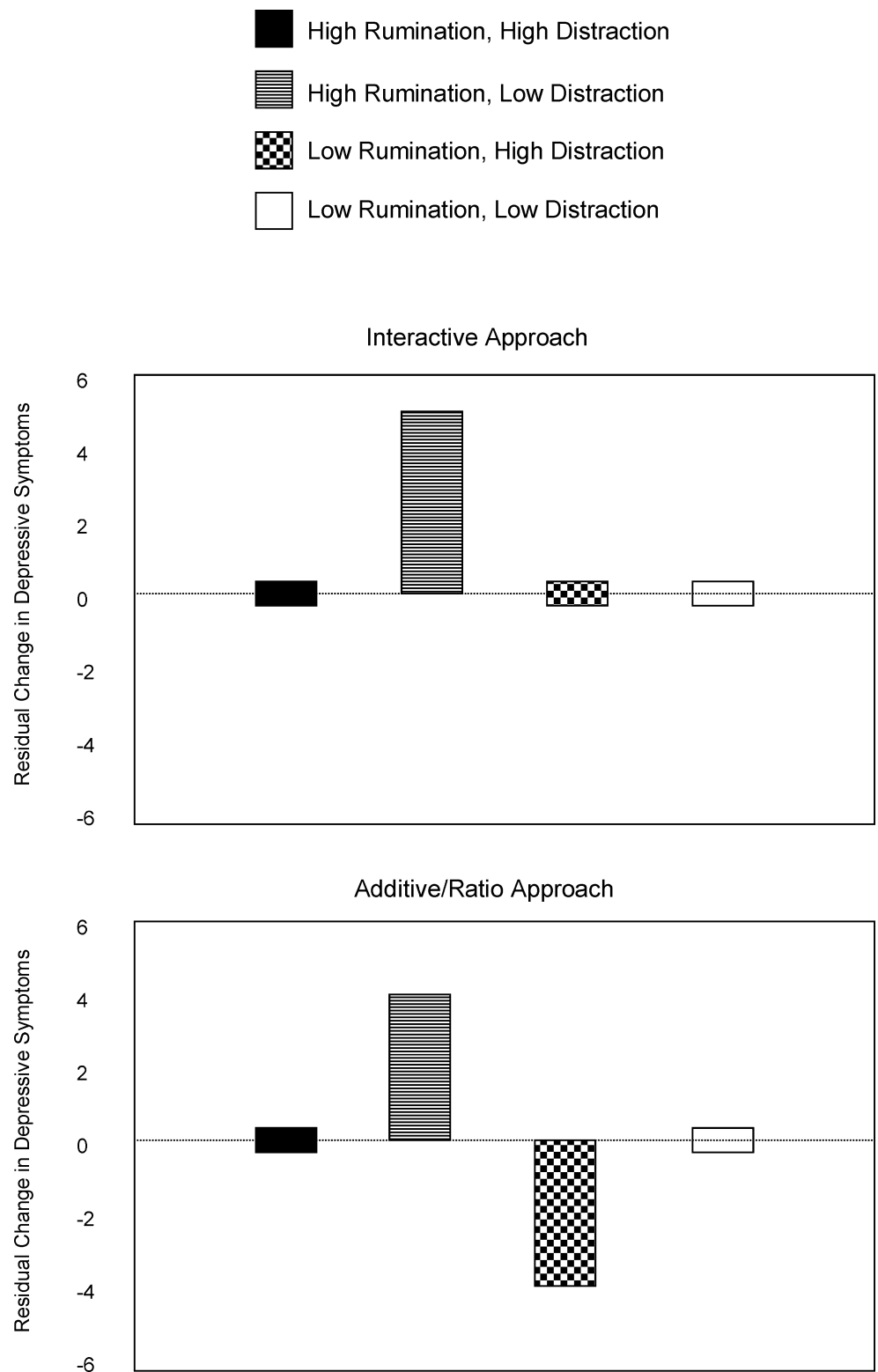
Research with adult samples, however, indicates that ruminative and distractive/problem solving response styles

are not inversely related but rather are orthogonal constructs (e.g., Butler and Nolen-Hoeksema 1994; Nolen-Hoeksema and Morrow 1991). With respect to child and early adolescent samples, ruminative and distractive response styles, as well as ruminative and problem solving, have been found to be either orthogonal (Abela et al. 2002a, seventh graders; Abela et al. 2004, seventh graders; Ziegert and Kistner 2002) or positively associated (e.g., Abela et al. 2002a, third graders; Abela et al. 2004, third graders).

If individuals do not exhibit a consistent response style, the traditional approach of examining rumination, distraction, and problem solving independently of one another may not adequately capture the degree to which youth are vulnerable to depression within the framework of the response styles theory. Consider the following: A child receives high scores on the rumination, distraction, and problem solving subscales of the Children's Response Style Questionnaire (CRSQ; Abela et al. 2004). When taking the traditional approach of examining each of the response styles separately, with regard to rumination, one would predict that the child would show increases in depressive symptoms over time. At the same time, when examining distraction and problem solving, one would predict that the child would show decreases in depressive symptoms over time. Thus, when examining each of the three response styles, contradictory predictions would be made for the same child.

One way to address this problem would be to use a data analytic approach that simultaneously takes into account levels on each of the three responses. For example, an interactive approach posits that (1) multiple vulnerability factors (i.e., high rumination and low distraction) interact synergistically to predict change in depression, and (2) individuals possessing only one vulnerability factor are at relatively equal risk for depression as individuals possessing neither vulnerability factor (see upper panel of Fig. 1). These hypotheses are based on the assumption that the interaction between the two vulnerability factors produces an effect that is greater than the sum of the effects of the individual vulnerability factors. Within the context of the response styles theory, an interactive approach would predict that youth who possess a ruminative response style will show increases in depressive symptoms over time only if they possess low levels of distraction/problem solving. The results of one study examining the response styles theory in an adolescent sample provided mixed support for an interactive approach. More specifically, Schwartz and Koenig (1996) reported that adolescents who exhibited high rumination/low distraction exhibited higher levels of current depressive symptoms than adolescents who exhibited low rumination/low distraction, low rumination/high distraction, and high rumination/high distraction. At the same time, results from longitudinal analyses failed to support the interactive approach. More specifically, although the

**Fig. 1** Predictions of an interactive versus an Additive/Ratio Approach towards conceptualizing the relations among the response styles



Rumination×Distraction interaction was a significant predictor of residual change in depression scores over the 6 week follow-up interval, the sign of the beta ( $\beta=0.12, p<0.05$ ) indicated that the effect was not in the predicted direction.

As Schwartz and Koenig do not discuss this unexpected result, it is unclear whether the low rumination/low distraction or the high rumination/high distraction exhibited the greatest increase in depressive symptoms over time.

We propose that the interactive approach towards conceptualizing the relations among the response styles is not adequate as it makes the assumption that high rumination/high distraction and low rumination/low distraction confer relatively the same degree of vulnerability to depression as low rumination/high distraction. Consider the following. The predictive validity of any questionnaire assessing response styles lies in its ability to predict how individuals actually respond to depressive symptoms. Individuals with high rumination and low distraction scores report engaging in rumination frequently and distraction infrequently. Consequently, the probability that they will engage in rumination is likely greater than the probability that they will engage in distraction. Individuals with high rumination and high distraction scores report using a wide array of ruminative and distractive responses. The type of response they utilize at any given moment is likely to be influenced by contextual variables including the number and/or types of stressors they encounter and/or the environmental resources available to them. Therefore, the probability that they will engage in rumination is likely equal to the probability that they will engage in distraction. Individuals with low rumination and low distraction scores report using a small array of ruminative and distractive responses. At the same time, given that their coping repertoire consists of a roughly equivalent number of ruminative and distractive techniques, the probability that they will engage in rumination is likely equivalent to the probability that they will engage in distraction. Finally, individuals with low rumination and high distraction scores report using a small number of ruminative responses and a large number of distractive responses. Consequently, the probability that they will engage in rumination is likely less than the probability that they will engage in distraction.

Using such a rationale, we predict: (1) high rumination/low distraction individuals are the most likely to engage in ruminative responses, and least likely to engage in distractive responses, and consequently the most likely to experience increases in depressive symptoms over time; (2) low rumination/high distraction individuals are the most likely to engage in distractive responses, and least likely to engage in ruminative responses, and consequently the most likely to experience decreases in depressive symptoms over time; and (3) both high rumination/high distraction and low rumination/low distraction individuals fall in between these two extreme groups both in terms of the likelihood that they will engage in ruminative/distractive responses and the likelihood that they will experience change in depressive symptoms over time.

We propose that the best way to conceptualize the relations among the response styles is to utilize either an additive or a ratio approach. Such approaches assume (1) multiple vulnerability factors exert independent effects on depression and (2) these effects can be combined in a linear fashion (see lower panel of Fig. 1). Importantly, within this

approach, the effect of one variable can either add to or cancel out the effect of another variable. For example, high levels of distraction can cancel out the effect of high levels of rumination. With respect to ratio scores (i.e., an individual's rumination score is divided by the sum of his/her distraction and problem solving scores), high ratio scores indicate a greater tendency to engage in rumination as opposed to distraction and problem solving, whereas low ratio scores indicate a greater tendency to engage in distraction and/or problem solving as opposed to rumination. High ratio scores should predict increases in depressive symptoms over time, whereas low ratio scores should predict decreases in depressive symptoms over time.

### The Relation Between Distraction and Problem Solving

Most studies of the response styles theory have examined only two of the response styles proposed by Nolen-Hoeksema (1987, 1991): rumination and distraction. Studies that also have assessed problem solving report a high correlation between distraction and problem solving in both youth (Abela et al. 2002a, 2004) and adults (Nolen-Hoeksema and Morrow 1991). Nolen-Hoeksema and Morrow (1991) suggested that people who exhibit a tendency to engage in active, adaptive distractions also may exhibit a tendency to engage in active problem solving in response to depressed mood. Furthermore, Nolen-Hoeksema (1991) posited that distraction followed by problem solving likely represents the most effective response style. As no factor analytic studies have examined whether distraction and problem solving items load onto the same or different factors it is unclear whether such items assess two independent, yet correlated, adaptive response styles or one combined adaptive response style.

### Sex Differences in Response Styles

Nolen-Hoeksema's (1987, 1991) response styles theory was originally proposed to explain the higher prevalence rates of depression among women than men. Specifically, she asserted that this difference can be partially accounted for by the fact that women are more likely to ruminate, whereas men are more likely to distract, in response to depressed mood. Nolen-Hoeksema and Girgus (1994) further hypothesized that such sex differences in response styles develop prior to adolescence. According to their perspective, the emergence of sex differences in depression during the transition from pre-adolescence to adolescence can be partially explained by the interaction of pre-existing sex differences in ruminative tendencies with increases in levels of stress occurring during the transition from early adolescence to adolescence.

Although two studies have found that fourth- and fifth-grade girls report engaging in ruminative responses more frequently than boys (Broderick 1998; Ziegert and Kistner 2002), two other studies have reported no sex differences in rumination in either third- or seventh-graders (Abela et al. 2002a, 2004). No studies utilizing child or early adolescent samples have obtained sex differences with respect to distraction or problem solving (Abela et al. 2002a, 2004; Ziegert and Kistner 2002). A likely reason for inconsistent findings with respect to sex differences in rumination in children and early adolescents is that reliable sex differences do not emerge until adolescence when sex differences in depression rates emerge (Hankin et al. 1998).

### Goals of the Current Study

The current study consisted of two phases. The goal of Phase One was to examine the factor structure and reliability of the Children's Response Styles Questionnaire (CRSQ) in a sample of 287 third- through seventh-grade school children. The goal of Phase Two was to provide a prospective test of the response styles theory of depression in a sample of children (ages 6–14) of parents with a history of major depressive episodes. As such children are four to six times more likely than other children to develop depressive symptoms (Beardslee et al. 1993; Weissman et al. 1997), the use of such a sample maximized the number of children who would experience increases in depressive symptoms during the course of the study consequently leading to a more powerful examination of our hypotheses. In line with the traditional approach of testing the response styles theory, we hypothesized that a ruminative response style would predict increases, whereas distractive and problem-solving response styles would predict decreases, in depressive symptoms during the 6-week follow-up interval. In addition, we hypothesized that high CRSQ ratio scores would predict increases, whereas low CRSQ ratio scores would predict decreases, in depressive symptoms during the 6-week follow-up interval. Last, we hypothesized that CRSQ ratio scores would be more strongly associated with residual change in depressive symptoms between Time 1 and Time 2 than would any of the individual response styles. We examined sex differences in levels of rumination, distraction, and problem solving in both Phase One and Phase Two. At the same time, due to the age group of participants in both Phases, we did not expect consistent sex differences to emerge.

### Method: Phase One

The primary objective of Phase One was to examine the factor structure and reliability of the CRSQ in a sample of

third through sixth grade schoolchildren. The secondary objective of Phase One was to examine sex differences in response styles.

### Participants

Consent forms were sent to all parents of third through sixth grade children at two public elementary schools in the English Montreal School District. Consent rates were 75 and 90%. The final sample consisted of 287 children (151 girls and 136 boys). Children's ages ranged from 7 to 12 with a mean age of 9 years and 6 months ( $SD=12.0$  months). The final sample was 94.4% Caucasian. The mother tongue of 89.8% of the sample was English.

### Procedure

After consent forms were collected, researchers went to each school to meet with the children. Children were told that their participation was voluntary and that they could choose not to participate. No child decided not to participate. During the initial assessment, a research assistant verbally administered the Children's Response Styles Questionnaire (CRSQ; Abela et al. 2004) to the children. Four weeks later, researchers met once again with the children from one of the two schools ( $n=99$ ; 53 girls and 46 boys). During this follow-up assessment, a research assistant verbally administered the CRSQ to the children. The children from the two schools did not significantly differ in terms of age, sex, ethnicity, mother tongue, or CRSQ scores.

### Measures

*Children's Response Styles Questionnaire (CRSQ; Abela et al. 2004)* The CRSQ is based on the Response Styles Questionnaire (Nolen-Hoeksema and Morrow 1991). Each of the 25 items in the CRSQ describes a specific response to depressive symptoms. The items are divided into three subscales: ruminative responses, distractive responses, and problem-solving responses. The rumination subscale consists of 13 items depicting self-focused responses to depressed mood. The distraction subscale consists of seven items depicting responses to depressed mood that redirect attention away from the sad mood. Finally, the problem-solving subscale consists of five items depicting methods of overcoming a depressed mood. Possible responses to each item include the following: almost never, sometimes, often, and almost always. Scores for each subscale are obtained by computing the mean for all items on the subscale. Scores range from 1 to 4 with higher scores indicating a greater tendency to engage in that particular response style.

Previous research in samples of third- and seventh-graders indicates moderate to high levels of internal consistency for all

three subscales (Abela et al. 2002a, 2004). Higher rumination scores have been found to be associated with higher levels of depressive symptoms (Abela et al. 2002a, 2004) and to predict increases in depressive symptoms over time (Abela et al. 2002a). In contrast, higher distraction and problem-solving scores have been found to be associated with lower levels of depressive symptoms (Abela et al. 2002a, 2004). In a study examining the convergent and discriminant validity of the CRSQ in a sample of 372 middle school children, Abela et al. (2002b) reported that higher levels of rumination were significantly associated with higher levels of self-consciousness ( $r=0.18$ ), hopelessness ( $r=0.20$ ), and depressive symptoms ( $r=0.50$ ), and lower levels of perceived control ( $r=-0.27$ ). In contrast, higher levels of distraction and problem-solving were significantly associated with lower levels of hopelessness ( $r=-0.20$ , and  $r=-0.35$ , respectively) and depressive symptoms ( $r=-0.27$ , and  $r=-0.47$ , respectively), and higher levels of perceived control ( $r=0.21$ , and  $r=0.46$ , respectively). Self-consciousness was not associated with either distraction ( $r=-0.05$ ) or problem-solving ( $r=0.07$ ).

## Results: Phase One

### Item Analysis

We first describe the decision processes leading to the retention or elimination of items. Twenty-one items were retained from the initial item pool of 25 items.

*Item-total Correlations* The first criterion for item elimination was the size of the item-total correlations. The goal here was to retain only items that showed sufficient correlations with their respective subscale. Items with a correlation smaller than  $r=0.20$  were eliminated. This resulted in four out of seven items on the distraction subscale being eliminated.

*Exploratory Factor Analysis* The 21 items then were subjected to a principal component factor analysis in order to explore the factor structure of the CRSQ measure. Missing values were treated listwise. The analysis was based on  $N=287$  participants with no missing data on any of the CRSQ items. Five factors with eigenvalues greater than 1.0 (Cattell 1966) were extracted from the matrix, explaining 49.51% of the variance. However, the eigenvalues for factors 3 to 5 were all lower than 1.45 and an inspection of the scree plot indicated a drop and then leveling off of the eigenvalues after the first two factors

(eigenvalues 3.64 and 3.02), suggesting that only two factors should be retained. The two factors together explained 31.73% of the total variance. A varimax rotation was then performed on these two factors to increase their interpretability. All items loaded above 0.40 on one of the two factors. Items on the first factor (13 items) reflect rumination (CRSQ-R). This subscale has an internal consistency of  $\alpha=0.77$ , a mean inter-item correlation of  $r=0.21$ , and a test-retest reliability over the 4 week interval of  $r=0.72$ . Items on the second factor (eight items) reflect distraction and problem-solving (CRSQ-DPS). This subscale has an internal consistency of  $\alpha=0.71$ , a mean inter-item correlation of  $r=0.26$ , and a test-retest reliability over the 4 week interval of  $r=0.71$ . The correlation between the two factors ( $r=0.04$ ) indicated that they are orthogonal constructs. The 21 items of the final scale as well as the factor loadings can be found in Table 1.

### Sex Differences

Contrary to the response styles theory, girls and boys did not significantly differ in CRSQ-R scores at either Time 1 (girls:  $\mu=2.04$ ,  $SD=0.50$ ; boys:  $\mu=1.98$ ,  $SD=0.55$ ;  $t(285)=0.96$ , *ns*) or Time 2 (girls:  $\mu=1.97$ ,  $SD=0.58$ ; boys:  $\mu=1.87$ ,  $SD=0.58$ ;  $t(96)=0.90$ , *ns*). Although boys and girls did not differ in CRSQ-DPS scores at Time 1 (girls:  $\mu=2.29$ ,  $SD=0.57$ ; boys:  $\mu=2.39$ ,  $SD=0.62$ ;  $t(284)=1.35$ , *ns*), boys reported higher CRSQ-DPS scores than girls at Time 2 (girls:  $\mu=2.05$ ,  $SD=0.54$ ; boys:  $\mu=2.35$ ,  $SD=0.55$ ;  $t(97)=2.71$ ,  $p<0.01$ ).

### Independence of Response Styles

Traditional approaches towards examining the vulnerability hypothesis of the response styles theory have assumed that rumination and distraction are inversely related. In other words, if an individual's CRSQ-R score is high, his/her CRSQ-DPS score should be average or low. Similarly, if an individual's CRSQ-DPS score is high, his/her CRSQ-R score should be average or low. In order to examine the degree to which these conditions were met in the current sample, children were classified as low (bottom quartile), average (middle quartiles), or high (top quartile) in terms of both rumination and distraction. In line with traditional analyses' assumption, 30.6% ( $n=26$ ) of children with a high CRSQ-R score had a CRSQ-DPS score that was either average or low. Similarly, 29.8% ( $n=25$ ) of children with a high CRSQ-DPS score had a CRSQ-R score that was either low or average. At the same time, contrary to traditional analyses' assumption, 69.4% of children ( $n=59$ ) of children

**Table 1** Children's Response Styles Questionnaire: item wording and factor loadings

Factor and item	Factor 1	Factor 2
Factor I: Rumination ( $\alpha=0.77$ )		
1. When I am sad, I think about how alone I feel	0.43	-0.30
3. When I am sad, I go away by myself and think about why I feel this way	0.52	-0.05
5. When I am sad, I think: "I'm ruining everything"	0.56	-0.21
7. When I am sad, I think about how sad I feel	0.56	0.06
9. When I am sad, I go someplace alone to think about my feelings	0.48	0.01
11. When I am sad, I think about how angry I am with myself	0.57	-0.12
13. When I am sad, I think about other times when I have felt sad	0.46	0.05
15. When I am sad, I think about a recent situation wishing it had gone better	0.46	0.05
17. When I am sad, I think: "There must be something wrong with me or I wouldn't feel this way"	0.42	0.02
19. When I am sad, I think: "I'm disappointing my friends, family, or teachers"	0.60	-0.02
21. When I am sad, I think about all my failures, faults, and mistakes	0.50	-0.25
23. When I am sad, I think: "Why can't I handle things better?"	0.57	-0.02
25. When I am sad, I think about how I don't feel like doing anything	0.46	-0.28
Factor II: distraction and problem-solving ( $\alpha=0.74$ )		
2. When I am sad, I help someone else with something so I don't think about my problem	0.27	0.43
10. When I am sad, I do something I enjoy	-0.02	0.47
12. When I am sad, I do something fun with a friend	-0.13	0.60
16. When I am sad, I ask a friend, parent, or teacher to help me solve my problem	0.21	0.66
18. When I am sad, I try to find something good in the situation or something I learned	0.28	0.60
20. When I am sad, I talk it out with someone who I think can help me feel better	0.11	0.68
22. When I am sad, I think of a way to make my problem better	0.12	0.60
24. When I am sad, I remind myself that this feeling will go away	0.10	0.60

with a high CRSQ-R score also had a high CRSQ-DPS score. Similarly, 70.2% ( $n=59$ ) of children with a high CRSQ-DPS score also had a high CRSQ-R score.

In order to compute CRSQ-RATIO scores, we divided each child's CRSQ-R score by his/her CRSQ-DPS score. Thus, higher scores reflected a greater tendency to engage in rumination as opposed to distraction and problem-solving in response to depressed mood. Although boys and girls did not differ in terms of CRSQ-RATIO scores at Time 1 (girls:  $\mu=0.96$ ,  $SD=0.40$ ; boys:  $\mu=0.90$ ,  $SD=0.38$ ;  $t(284)=1.23$ , *ns*), girls exhibited higher CRSQ-RATIO scores at Time 2 than did boys (girls:  $\mu=1.04$ ,  $SD=0.41$ ; boys:  $\mu=0.84$ ,  $SD=0.29$ ;  $t(96)=2.84$ ,  $p<0.01$ ).

### Method: Phase Two

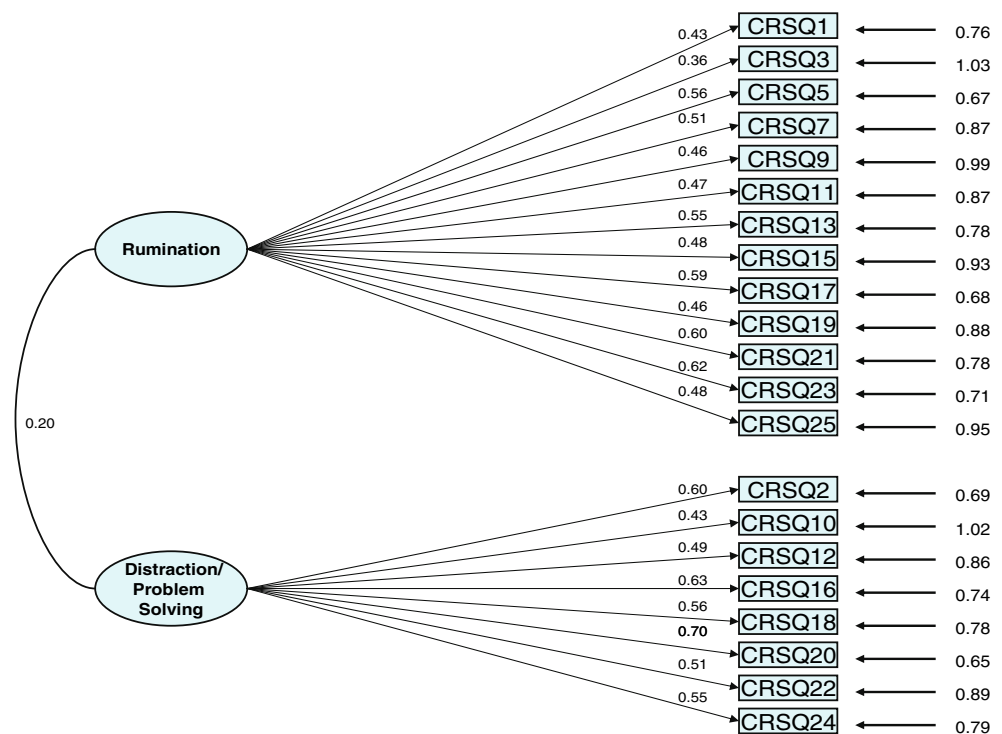
The primary objectives of Phase Two were (1) to examine the CRSQ factor structure obtained in Phase One in a sample of children and early adolescents using confirmatory factor analysis (Fig. 2), (2) to provide a prospective test of the response styles theory of depression, and (3) to examine whether CRSQ-RATIO scores were more strongly associated with change in depressive symptoms over time than were the separate CRSQ-R and CRSQ-DPS scores. The secondary objective of Phase Two was to examine sex differences in response styles.

### Participants

Participants were recruited in two phases. In the first phase, participants were recruited through ads placed in local newspapers as well as through posters placed throughout the greater Montreal area. All ads and posters were in English and specifically advertised for parents with a history of depressive episodes. One hundred ninety five people responded to these ads. Respondents were invited to participate in a telephone interview during which a diagnostician administered the affective disorders module of the Structured Clinical Interview for the DSM-IV-Axis I (SCID-I; First et al. 1995). Verbal consent was obtained from all potential participants prior to conducting the SCID-I. One hundred and seventeen parents met criteria for either a current or past major depressive episode and were invited to participate in the study. Eighty-six parents, with 122 children in the appropriate age range, decided to participate.

In the second phase, diagnosticians called the parents of children who participated in a previous study in our lab and invited them to participate in the current study. The only selection criterion for the past study was having a child between the ages of 7 and 13. All 55 parents agreed to complete the telephone interview. Sixteen of these parents met criteria for either a current or past major depressive

**Fig. 2** Confirmatory factor analysis of the Children's Response Styles Questionnaire: standardized factorial model



episode and were invited to participate in the study. All 16 parents, with 18 children in the appropriate age range, decided to participate<sup>1</sup>.

The final sample consisted of 140 children (69 boys and 71 girls) and one of their parents (88 mothers and 14 fathers). In all cases, the participating parent was the parent who had completed the phone interview and met criteria for either a current or past major depressive episode. Children's ages ranged from six to fourteen (mean=9.8, SD=2.4, median=10). Parents' ages ranged from 27 to 53 (mean=40.3, SD=6.4, median=41). The sample was 84.3% Caucasian ( $n=118$ ), 4.9% Asian ( $n=7$ ), 2.9% Hispanic ( $n=4$ ), 1.9% African-American ( $n=1$ ), 1.1% Native American ( $n=1$ ), and 4.9%

of other descent ( $n=7$ ). The mother tongue of participants included English (68.7%;  $n=70$ ), French (9.8%;  $n=10$ ), Spanish (2.9%;  $n=3$ ), and other languages (18.6%;  $n=19$ ; e.g., German,  $n=3$ , and Portuguese,  $n=3$ ). Importantly, all parents reported that they and their child were fluent in English. Of the parents, 14.7% were single ( $n=21$ ), 43.1% were married ( $n=60$ ), 9.8% were separated ( $n=14$ ), 27.5% were divorced ( $n=38$ ), 1.0% was widowed ( $n=1$ ), 3.9% were none of the above ( $n=6$ ). The median family income ranged from \$30,000 to \$45,000.

#### Procedure

At the beginning of the initial laboratory assessment (Time 1), children were informed that their participation was voluntary (all children chose to participate) and parents completed consent and demographics forms. Subsequently a research assistant verbally administered the Children's Depression Inventory (CDI; Kovacs 2003) and the CRSQ (Abela et al. 2004) to the child. Six weeks later (Time 2), research assistants telephoned the children and verbally administered the CDI. Families were compensated for their participation.

#### Measures

*The Structured Clinical Interview for the DSM-IV (SCID-I; First et al. 1995)* The SCID-I is a semi-structured clinical interview designed to arrive at current and lifetime DSM-IV

<sup>1</sup> In order to examine whether our high-risk (HR) sample of children differed from a similarly recruited low-risk (LR) sample of children, the 50 children of the 39 parents who did not meet criteria for either a past or current major depressive episode were invited to the laboratory to complete a series of questionnaires including the CRSQ and the CDI. Although our HR and LR samples did not differ in terms of age (HR:  $\mu=9.84$ ,  $SD=2.36$ ; LR:  $\mu=10.14$ ,  $SD=1.47$ ;  $t(188)=0.85$ ,  $ns$ ), gender (HR:  $\mu=0.51$ ,  $SD=0.50$ ; LR:  $\mu=0.46$ ,  $SD=0.50$ ;  $t(188)=0.66$ ,  $ns$ ), and distraction/problem-solving (HR:  $\mu=2.42$ ,  $SD=0.69$ ; LR:  $\mu=2.50$ ,  $SD=0.63$ ;  $t(188)=0.75$ ,  $ns$ ), our HR sample reported higher levels of both depressive symptoms (HR:  $\mu=10.08$ ,  $SD=6.74$ ; LR:  $\mu=6.78$ ,  $SD=4.70$ ;  $t(188)=3.19$ ,  $p<0.01$ ) and rumination (HR:  $\mu=2.20$ ,  $SD=0.60$ ; LR:  $\mu=1.97$ ,  $SD=0.52$ ;  $t(188)=2.44$ ,  $p<0.05$ ) than our LR sample. In addition, children in the HR sample ( $n=38$ ; 27.8%) were more likely than children in the LR sample ( $n=6$ ; 12.0%) to report levels of depressive symptoms on the CDI that fell in the above average range (CDI  $\geq 13$ ;  $\chi^2=4.75$ ,  $p<0.05$ ).



diagnoses. The current study employed the mood disorder module and the psychotic screen in order to allow for the diagnosis of current and past history of DSM-IV mood disorders. In addition, we utilized the SCID-I to assess severity of current level of depressive symptoms. Severity scores ranged from 0 to 9 with 0 indicating that criteria were not met for any of the nine DSM-IV major depression symptoms and 9 indicating that criteria were met for all nine DSM-IV major depression symptoms. Of the parents, 47% met criteria for a current major depressive episode and 53% met criteria for a past major depressive episode at the time of the initial assessment with parents' SCID-I severity scores ranging from 0 to 9. The SCID-I yields reliable diagnoses of depressive disorders (Zanarini et al. 2000) and is frequently used in clinical studies of depression in adults.

Diagnostic interviewers completed an intensive training program for administering the SCID and for assigning DSM-IV diagnoses. The training program consisted of attending approximately 80 h of didactic instruction, listening to audiotaped interviews, conducting practice interviews, and passing regular exams (85% or above). The principal investigator (PI) held weekly supervision sessions for the interviewers. The PI also reviewed interviewers' notes and tapes in order to confirm the presence or absence of a diagnosis. Discrepancies were resolved through consensus meetings and best estimate procedures.

*Child Depression Inventory (CDI; Kovacs 2003)* The CDI is a 27-item self-report questionnaire that measures the cognitive, affective, and behavioral symptoms of depression. For each item, children were asked whether it described how they were thinking and feeling in the past week. Items are scored from 0 to 2; higher score indicate greater symptom severity. Total CDI scores range from 0 to 52. The CDI is reliable, valid, and can distinguish children with major depressive disorders from nondepressed children (Kovacs 2003). Coefficient alpha was 0.84 (Time 1) and 0.83 (Time 2) in the current study.

## Results: Phase 2

### Examining Non-independence in Data

Given that 38 pairs of siblings participated in the current study, we conducted preliminary analyses examining whether non-independence in our data impacted the results. To do so, we first ran all analyses including only (1) the 64 children who did not have a sibling participating in the current study and (2) the first child from each sibling pair to complete the assessment ( $n=38$ ). Next, we ran all analyses including only (1) the 64 children who did not have a

sibling participating in the current study and (2) the second child from each sibling pair to complete the assessment ( $n=38$ ). Last, we ran all analyses including all 140 children. The direction and magnitude of effects were similar in all three sets of analyses suggesting that the inclusion of siblings in the current study did not have a significant impact on the pattern of findings obtained. In addition, all relations reported as significant ( $p<0.05$ ) in the current manuscript were also significant in analyses excluding either the first or second sibling.<sup>2</sup>

### Confirmatory Factor Analysis

We conducted a confirmatory factor analysis (CFA) in order to examine whether the factorial structure identified in Study 1 replicated in our sample of high-risk children. Evaluation of fit indices indicated that the two-factor model fit the data well [ $\chi^2(188)=250.65$ ,  $p=0.01$ ;  $\chi^2/df$ -ratio=1.33; CFI=0.98, RMSEA=0.049]. The resulting standardized model is shown in Fig. 1. Fit of a one-factor model was much lower [ $\chi^2(189)=326.00$ ,  $p<0.001$ ;  $\chi^2/df$ -ratio=1.73; CFI=0.96, RMSEA=0.072]. A comparison of the one- and two-factor models showed that the overall fit of the two-factor model was significantly better ( $326.00-250.65=75.35$ ,  $df=1$ ) than that of a one-factor model for these data.

### Descriptive Data

Both the CRSQ rumination and CRSQ distraction and problem solving subscales exhibited moderate levels of internal consistency (alphas=0.82 and 0.79 respectively). In order to compute CRSQ-RATIO scores, we divided each child's CRSQ-R score by his/her CRSQ-DPS score. Thus, higher scores reflected a greater tendency to engage in rumination as opposed to distraction and problem-solving in response to depressed mood. Means and standard deviations for all Time 1 and Time 2 measures are presented separately for girls and boys in Table 2. There were no sex differences in any variable.

Inter-correlations among age, Time 1 measures, and Time 2 measures are presented in Table 3. Consistent with past cross-sectional research: (a) higher levels of rumination at Time 1 were associated with higher levels of depressive symptoms at both Time 1 and Time 2, and (b) higher levels of distraction and problem-solving scores were associated with lower levels of depressive symptoms at both Time 1 and Time 2. Higher CRSQ-RATIO scores were associated

<sup>2</sup> Details on these specific analyses are available from the first author.

**Table 2** Means and standard deviations by gender

Variable	Girls		Boys		<i>t</i> (137)
	Mean	SD	Mean	SD	
CRSQ-R	2.26	0.66	2.15	0.54	1.07
CRSQ-D PS	2.45	0.75	2.40	0.64	0.40
CRSQ-RATIO	1.01	0.49	0.99	0.52	0.25
Time 1 CDI	9.84	6.76	10.48	9.84	0.56
Time 2 CDI	7.86	6.37	8.25	6.06	0.32
CDI residual change	-0.12	5.14	0.12	4.34	0.26
Age	9.55	2.42	10.10	2.29	1.38
SCID-SXS	3.19	3.57	1.99	3.15	2.12*

CRSQ-R Children's Response Style Questionnaire, Rumination Subscale, CRSQ-D Children's Response Styles Questionnaire, Distraction and Problem-solving Subscale, CRSQ-RATIO ratio of CRSQ-R to CRSQ-DPS, CDI Residual Change unstandardized residual change in CDI scores from Time 1 to Time 2, SCID-SXS number of symptoms of DSM-IV Major Depressive Disorder currently met by parent

\* $p < 0.05$

with higher levels of depressive symptoms at both Time 1 and Time 2.<sup>3</sup>

#### Independence of Response Styles

The CRSQ rumination subscale was not significantly associated with the CRSQ distraction and problem solving subscale ( $r = 0.09$ , *ns*). In line with traditional analyses' assumption that rumination and distraction are inversely related, 56.8% ( $n = 21$ ) of children with a high (top quartile) CRSQ-R score had a CRSQ-DPS score that was either average (middle quartiles) or low (bottom quartile). Similarly, 61.0% ( $n = 25$ ) of children with a high CRSQ-DPS score had a CRSQ-R score that was either low or average. At the same time, contrary to traditional analyses' assumption, 43.2% of children ( $n = 16$ ) of children with a high CRSQ-R score also had a high CRSQ-DPS score. Similarly, 39.0% ( $n = 16$ ) of children with a high CRSQ-DPS score also had a high CRSQ-R score.

Higher CRSQ-RATIO scores were associated with higher levels of depressive symptoms at both Time 1 and Time 2 (see Table 3). An analysis of the difference between pairs of dependent correlations (Cohen and Cohen 1983)

indicated that the association between CRSQ-RATIO scores and CDI scores was significantly greater than the strength of the association between CRSQ-R and CDI scores at both Time 1 [ $t(139) = 2.01$ ,  $p < 0.01$ ] and Time 2 [ $t(106) = 1.74$ ,  $p < 0.08$ ]. Similarly, the association between CRSQ-RATIO scores and CDI scores was significantly greater than the strength of the association between CRSQ-DPS and CDI scores at both Time 1 [ $t(139) = 2.67$ ,  $p < 0.01$ ] and Time 2 [ $t(139) = 3.06$ ,  $p < 0.01$ ].

#### Overview of Statistical Analyses: Predicting Change in Depressive Symptoms from Time 1 to Time 2

To test whether response styles predicted change in depressive symptoms over time, we conducted hierarchical multiple regression analyses (Cohen and Cohen 1983). In all cases, the dependent variable was Time 2 CDI scores. Parent's current level of depressive symptoms (i.e. the parent's number of current DSM-IV symptoms of depression; SCID-SXS) was entered first into the regression equation in order to control for the impact of parent's current depressive symptoms on their children's levels of depressive symptoms. Second, we entered AGE and SEX into the equation. Third, in order to control for initial differences between participants in baseline levels of depressive symptoms, we entered Time 1 CDI scores. Fourth, to examine if response styles were associated with residual change in CDI scores from Time 1 to Time 2, we entered CRSQ scores (either CRSQ-R, CRSQ-DPS, or CRSQ-RATIO). Last, to examine whether age and/or sex moderated the relations among response styles and change in depressive symptoms over time, all two- and three-way interactions involving CRSQ, AGE, and SEX were entered in steps five and six respectively. In all cases, the assumption of homogeneity of covariance was met (Joiner 1994).

<sup>3</sup> Based on the results of our factor analysis, we decided to use the combined distraction and problem solving subscale of the CRSQ rather than the two separate subscales. At the same time, higher scores on both the distraction and problem solving subscales were associated with lower levels of depressive symptoms at Time 1 ( $r = -0.27$ ,  $p < 0.01$ , and  $r = -0.19$ ,  $p < 0.05$ , respectively). The correlation between the distraction and problem solving subscales was 0.58,  $p < 0.001$ . Neither distraction ( $r = 0.09$ , *ns*) nor problem solving ( $r = 0.15$ , *ns*) were significantly associated with rumination. Both the three-item distraction CRSQ subscale and the five-item problem solving exhibited moderate internal consistency (alphas = 0.61 and 0.73, respectively).

**Table 3** Intercorrelations between all measures

	1	2	3	4	5	6	7	8
1. CRSQ-R	–							
2. CRSQ-DPS	0.15	–						
3. CRSQ-RATIO	0.62***	–0.63***	–					
4. Time 1 CDI	0.33***	–0.24**	0.38***	–				
5. Time 2 CDI	0.39***	–0.28**	0.48***	0.65***	–			
6. CDI residual change	0.21*	–0.23*	0.33**	0.00	0.76***	–		
7. Age	–0.11	–0.30***	0.17	0.06	0.05	0.02	–	
8. SCID-SXS	0.15	–0.02	0.18*	0.13	0.19*	0.14	–0.09	–

CRSQ-R Children’s Response Style Questionnaire, Rumination Subscale, CRSQ-DPS Children’s Response Styles Questionnaire, Distraction and Problem-solving Subscale, CRSQ-RATIO ratio of CRSQ-R to CRSQ-DPS, CDI Children’s Depression Inventory, SCID-SXS number of symptoms of DSM-IV Major Depressive Disorder currently met by parent

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

**Longitudinal Analyses: Predicting Change in Depressive Symptoms from Time 1 to Time 2**

Results pertaining to CRSQ-R are presented in the top panel of Table 4. The tendency to engage in ruminative responses was a significant predictor of residual change in

CDI scores from Time 1 to Time 2. To examine the magnitude of this relation, the equation summarized in the top panel of Table 4 was used to calculate predicted CDI residual change scores for children possessing low and high CRSQ-R scores (i.e., 1.5 SD above or below the sample mean; Cohen and Cohen 1983). In line with the response

**Table 4** Predicting residual change in CDI scores from Time 1 to Time 2

Predictor	$R^2$	$F$ for increment in $R^2$ for set	$t$ for within-set predictors	$df$	Partial corr. ( $pr$ )
1. SCID-SXS	0.04	4.44*	2.11	1, 103	0.20
2. Control variables	0.05	0.27		2, 101	
GENDER			–0.56	101	–0.06
AGE			0.36	101	0.04
3. Time 1 CDI	0.43	67.75***		1, 100	0.64
4. CRSQ-R	0.46	4.27*		1, 99	0.20
5. Two-way interactions	0.46	0.35		3, 96	
CRSQ-R × GENDER			–0.06	96	–0.02
CRSQ-R × AGE			–0.98	96	–0.10
AGE × GEN × ER			–0.15	96	–0.02
6. CRSQ-R × AGE × GENDER	0.46	0.33	–0.58	1, 95	–0.06
4. CRSQ-DPS	0.49	7.63**		1, 94	–0.27
5. Two-way interactions	0.49	0.17		3, 91	
CRSQ-DPS × GENDER			–0.40	91	–0.04
CRSQ-DPS × AGE			–0.52	91	–0.05
AGE × GENDER			0.24	91	0.03
6. CRSQ-DPS × AGE × GENDER	0.50	1.06	1.03	1, 90	0.11
4. CRSQ-RATIO	0.51	12.27**		1, 94	0.34
5. Two-way interactions	0.53	0.91		3, 91	
CRSQ-RATIO × GENDER			–0.57	91	–0.06
CRSQ-RATIO × AGE			–1.42	91	–0.15
AGE × GENDER			0.25	91	0.03
6. CRSQ-RATIO × AGE × GENDER	0.54	1.82		1, 90	0.14

SCID-SXS Number of symptoms of DSM-IV Major Depressive Disorder currently met by parent. CDI Children’s Depression Inventory, Composite Score, CRSQ-R Children’s Response Style Questionnaire, Rumination Subscale, CRSQ-D Children’s Response Styles Questionnaire, Distraction and Problem-solving Subscale, CRSQ-RATIO ratio of CRSQ-R to CRSQ-DPS

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

styles theory, low levels of rumination were associated with decreases (predicted residual change score = -1.47) whereas high levels were associated with increases (predicted residual change score = 1.55) in depressive symptoms.

Results pertaining to CRSQ-DPS are presented in the middle panel of Table 4.<sup>4,5</sup> The tendency to engage in distractive and problem-solving responses was a significant predictor of residual change in CDI scores. To examine the magnitude of this relation, the equation summarized in the middle panel of Table 4 was used to calculate predicted CDI residual change scores for children possessing low and high CRSQ-DPS scores. In line with hypotheses, low levels of distraction and problem-solving were associated with increases (predicted residual change score = 1.51), whereas high levels of distraction and problem-solving were associated with decreases (residual change score = -1.83) in depressive symptoms.

Results pertaining to CRSQ-RATIO from Time 1 to Time 2 are presented in the bottom panel of Table 4. CRSQ-RATIO was a significant predictor of residual change in CDI scores from Time 1 to Time 2. To examine the magnitude of this relation, the equation summarized in the bottom panel of Table 4 was used to calculate predicted CDI residual change scores for children possessing low and high CRSQ-RATIO scores. In line with our hypotheses, low CRSQ-RATIO scores were associated with decreases (predicted residual change score = -2.47) whereas high CRSQ-RATIO scores were associated with increases (predicted residual change score = 2.17) in depressive symptoms.

An analysis of the difference between pairs of dependent correlations (Cohen and Cohen 1983) showed that the association between CRSQ-RATIO scores and CDI residual

change scores (after controlling for SCID-SXS, AGE, and SEX;  $pr=0.34$ ) was significantly greater than the strength of the association between CRSQ-R and residual change scores ( $pr=0.20$ ;  $t(99) = 2.80$ ,  $p<0.01$ ). Similarly, the association between CRSQ-RATIO scores and CDI residual change scores was significantly greater than the strength of the association between CRSQ-DPS and CDI residual change scores [ $pr=-0.27$ ;  $t(99)=2.43$ ,  $p<0.01$ ].

#### Overview of Statistical Analyses: Testing an Interactive Model

In order to examine the alternative model that the CRSQ-R  $\times$  CRSQ-DPS interaction will predict residual change in CDI scores between Time 1 and Time 2 above and beyond both CRSQ-R and CRSQ-DPS alone, we conducted hierarchical multiple regression analyses (Cohen and Cohen 1983). The dependent variable was Time 2 CDI scores. Parent's current level of depressive symptoms was entered first into the regression equation. AGE and SEX were entered second. Time 1 CDI scores were entered third. CRSQ-R and CRSQ-DPS were entered fourth. This step allowed for an examination of the unique effects of each of the individual response styles. To provide a test of the alternative model, the CRSQ-R  $\times$  CRSQ-DPS interaction was entered fifth. To examine age and/or sex differences, all two-, three-, and four-way interactions involving CRSQ-R, CRSQ-DPS, AGE, and SEX were entered in steps five, six, and seven respectively. The assumption of homogeneity of covariance was met (Joiner 1994).

#### Longitudinal Analyses: Testing an Interactive Model

Results pertaining to the interactive model are presented in Table 5. Both CRSQ-R and CRSQ-DPS exhibited unique effects in predicting residual change in depressive symptoms over time. Contrary to the interactive model, however, CRSQ-R  $\times$  CRSQ-DPS was not a significant predictor of residual change scores.

## Discussion

Several findings emerged from the current study. First, consistent with the study by Abela et al. (2002a), the current study found that the tendency to ruminate in response to depressed mood predicted increases in depressive symptoms over the 6-week follow-up interval. Further, the strength of the association between rumination and increases in depressive symptoms over time was not moderated by age. Such a finding adds to a growing body of prospective research providing support for the applicability of cognitive theories of vulnerability to depression to

<sup>4</sup> The CRSQ distraction subscale approached significance in predicting residual change in depressive symptoms from Time 1 to Time 2 ( $pr=-0.17$ ,  $p<0.07$ ) after controlling for SCID-I-SXS, AGE, SEX, and Time 1 CDI scores. The CRSQ problem-solving scale was a significant predictor of residual change in CDI scores from Time 1 to Time 2 ( $pr=-0.29$ ,  $p<.01$ ) after controlling for SCID-I-SXS, AGE, SEX, and Time 1 CDI scores. A test of the difference between dependent correlations indicated that the strength of the association between the problem solving scale and residual change in CDI scores did not significantly differ from the strength of the association between distraction and residual change in CDI scores ( $t(103)=0.78$ ,  $ns$ ).

<sup>5</sup> In response to one reviewer's suggestion, we split the sample at age 10 and examined distraction separately in the 6–9 and 10–14 year old children. Distraction was significantly associated with decreases in depressive symptoms between Time 1 and Time 2 in the older children ( $pr=-0.32$ ,  $p<.05$ ) but not younger children ( $pr=-0.18$ ,  $ns$ ). At the same time, in the sample as a whole, the DISTRACTION  $\times$  AGE interaction was not significant, indicating that these age differences are not statistically significant. In contrast, problem solving was significantly associated with decreases in depressive symptoms in both older ( $pr=-0.29$ ,  $p<0.05$ ) and younger ( $pr=-0.29$ ,  $p<0.05$ ) children.

**Table 5** Predicting residual change in CDI scores from Time 1 to Time 2

Predictor	$R^2$	$F$ for increment in $R^2$ for set	$t$ for within-set predictors	$df$	Partial corr. ( $pr$ )
1. SCID-SXS	0.05	5.11*	2.26 *	1, 98	0.22
2. Control variables	0.05	0.09		2, 96	
GENDER			−0.41	96	−0.04
AGE			0.06	96	0.01
3. Time 1 CDI	0.45	68.85***	8.30***	1, 95	0.65
4. Response styles	0.53	7.61 **		2, 93	
CRSQ-R			2.67**	93	0.27
CRSQ-DPS			−3.12**	93	−0.31
5. Two-way interactions	0.56	1.16		6, 87	
CRSQ-R×GENDER			0.60	87	0.04
CRSQ-R×AGE			−2.33*	87	−0.17
CRSQ-DPS×GENDER			−1.14	87	−0.08
CRSQ-DPS×AGE			0.58	87	0.04
CRSQ-R×CRSQ-DPS			−1.63	87	−0.12
AGE×GENDER			0.04	87	−0.01
6. Three-way interactions	0.59	1.47		4, 83	
CRSQ-R×CRSQ-DPS×AGE			−0.01	83	−0.00
CRSQ-R×CRSQ-DPS×GENDER			−0.04	83	0.00
AGE×GENDER×CRSQ-R			−1.54	83	−0.11
AGE×GENDER×CRSQ-DPS			1.84	83	0.13
7. AGE×GENDER×CRSQ-R×CRSQ-DPS	0.60	1.22	−1.10	1, 82	−0.12

*SCID-SXS* Number of symptoms of DSM-IV Major Depressive Disorder currently met by parent. *CDI* Children's Depression Inventory, Composite Score, *CRSQ-R* Children's Response Style Questionnaire, Rumination Subscale, *CRSQ-DPS* Children's Response Styles Questionnaire, Distraction and Problem-solving Subscale

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

child populations (e.g., for a review of relevant literature, see Abela and Hankin 2007). Discovering that cognitive factors, such as a ruminative response style, confer vulnerability to depression in children and early adolescents suggests mechanisms to target in both the treatment and prevention of childhood depression. In addition, discovering cognitive theories of vulnerability to depression extend downward to children highlights the potential need for cognitive-behavioral depression prevention programs that target younger age groups than do current programs (e.g., Gillham et al. 2007; Spence 2007).

Second, contrary to findings obtained by Abela et al. (2002a), but in line with the response styles theory, the tendency to distract and problem-solve in response to depressed mood predicted decreases in depressive symptoms over the 6-week follow-up interval. One likely explanation for the discrepant results between the two studies is that they utilized different scales to assess distraction and problem solving. More specifically, Abela et al. (2002a) used the original CRSQ distraction and problem solving subscales. In contrast, the current study utilized the CRSQ combined distraction and problem solving subscale derived from the factor-analysis conducted during Phase One of the current study. A second possible explanation for such discrepant

findings is that Abela et al. (2002a) utilized a community sample whereas the current study utilized a high-risk sample. The use of a high-risk sample is likely to have led to a greater proportion of children exhibiting elevated levels of depressive symptoms at Time 1 which would allow for a more powerful examination of whether distraction and problem solving are associated with decreases in depressive symptoms over time.

Interestingly, items from the distraction and problem solving subscales of the CRSQ loaded onto a single factor in our Phase One factor-analysis. Such a finding is not surprising given the high degree of association that consistently has been found between distraction and problem solving in research examining the response styles theory in children (Abela et al. 2002a, 2004), early adolescents (Abela et al. 2002a, 2004), and adults (Nolen-Hoeksema and Morrow 1991). It is also important to note that although both the Response Styles Questionnaire (Nolen-Hoeksema and Morrow 1991) and the Children's Response Styles Questionnaire (Abela et al. 2004) were created containing separate scales for distraction and problem-solving, the current study is the first study to utilize factor analytic techniques to examine whether distraction and problem solving items actually fall onto

separate factors. The finding that such items comprise a single factor suggests that the combination of distraction and problem solving likely constitutes a singular response style. Such a finding is not necessarily inconsistent with the response styles theory as Nolen-Hoeksema (1991, p. 575) described distraction followed by problem-solving as the optimal technique for reducing depressive symptoms.

Third, the results of the current study are in line with our hypothesis that research examining the response styles theory is likely to benefit from taking a data-analytic approach that takes into account participants' levels on each of the three response styles. More specifically, in contrast to the assumption that rumination is inversely associated with distraction and problem solving, a ruminative response style was not associated with a distraction/problem solving response style. Rather, these two response styles were orthogonal constructs in both Phase One and Phase Two. Further posing difficulties for the traditional approach of examining the effect of each of the response styles separately, across administrations of the CRSQ in the current study, between 43.2 and 69.4% of children who scored in the top quartile on the rumination subscale of the CRSQ also scored in the top quartile on the distraction/problem solving subscale. Similarly, between 39.0 and 70.2% of children who scored in the top quartile of the distraction/problem-solving subscale of the CRSQ also scored in the top quartile on the rumination subscale. Last, CRSQ ratio scores were found to be more strongly associated with current depressive symptoms than were either CRSQ rumination or CRSQ distraction and problem solving scores. CRSQ ratio scores were also more strongly associated with residual change in depressive symptoms over the 6-week follow-up interval than were either the individual CRSQ rumination scores or CRSQ distraction and problem solving scores. Such results suggest that knowing the degree of balance between children's maladaptive and adaptive response styles may provide researchers with more information about their degree of vulnerability to depression than simply knowing their level of any specific response style. At the same time, given that the current study is the first to examine CRSQ ratio scores, more research is needed to replicate these findings. In addition, just as results from research examining theories of vulnerability to depression in adult populations do not automatically extend downward to younger populations, results from research examining such theories in children cannot automatically be extended upwards to adolescents and adults. Thus, research is needed examining the association between CRSQ ratio scores or RSQ ratio scores and change in depressive symptoms over time in child, adolescent, and adult populations.

Last, in line with past research (e.g., Abela et al. 2002a, 2004), the results of the present study revealed that girls

and boys were equally likely to engage in distraction and problem-solving in response to depressed mood. In addition, consistent with findings obtained by both Abela et al. (2002a) and Abela et al. (2004), but in contrast to those obtained by both Broderick (1998) and Ziegert and Kistner (2002), results failed to support the hypothesis that girls are more likely than boys to ruminate in response to depressed mood. This finding is likely to have resulted because consistent sex differences in response styles may not emerge until adolescence. Thus, future research may benefit from examining the theory in both preadolescent and adolescent samples to determine the age at which sex differences in response styles begin to occur. In addition, future research should investigate the relation between the emergence of sex differences in response styles and the emergence of sex differences in the prevalence rates of depression during this time period as doing so is likely to provide a more thorough understanding of the response styles theory.

Several limitations of the current study should be noted. First, the present study utilized self-report measures to assess depressive symptoms. Although the CDI possesses high degrees of validity and reliability, we cannot draw conclusions about clinically diagnosed depression based on self-report questionnaires. Future studies should incorporate clinical interviews in order to assess whether current findings can be extended to cases of clinical depression. Second, the current study utilized a sample of high-risk children. Although such a design leads to a more powerful test of the response styles theory, results may not generalize to the entire population. Consequently, future research examining the theory should utilize a community sample of children. Last, the longitudinal analyses in this study had small to medium effect sizes. Social science literature frequently reports effect sizes of a similar magnitude. Nonetheless, these values indicate that response styles are likely to be only one of many factors influencing the etiology of depression in children. Identifying additional factors and examining how these factors interact with response styles will ultimately offer a more complete understanding of the response styles theory.

In conclusion, results from the present study provide support for the extension of the response styles theory to children and early adolescents. This study not only replicated previous findings that a ruminative response style predicts increases in depressive symptoms over time in children, but also provided the first support for the hypothesis that a distraction and problem-solving response style predict decreases in depressive symptoms over time in youth. Additionally, the present findings suggest that a data-analytic approach that simultaneously takes into account individuals' levels on multiple response styles is likely to lead to a more accurate predictor of children's degree of vulnerability to depression than a data-analytic approach in

which individual response styles are examined in isolation of one another. Future research examining the current study's hypotheses using more comprehensive measures of depressive symptoms as well as community samples of youth is likely to further advance our understanding of the cognitive variables underlying vulnerability to depression.

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