

Correlations among all study variables are shown in Table 2. The cognitive composite variable was moderately stable across time with correlations ranging from .32 to .61. Total stress showed low to moderate levels of stability across time with correlations between .27 and .54; interpersonal stressors were moderately correlated over time with the exception of the relation between interpersonal stressors at Times 3 and 4. Achievement stressors showed low levels of stability at the first three time points and no stability at the last two time points. Depressive symptoms were moderately stable over time ( $r_s = .48 - .60$ ). At most time-points, the annual level of stress scores were not significantly related to depressive symptom scores, whereas a more negative cognitive style was consistently correlated with higher levels of depressive symptoms.

### *Multi-level Models*

*Preliminary Models.* Two preliminary models were fit first: the unconditional means model in which only the intercept predicted person-centered depression scores and the unconditional growth model in which the intercept and time variables (represented by age) predicted depression. The primary purpose of the unconditional means model is to determine how much variance in the outcome is due to within-person (level-1) variance and between-person (level-2) variance and whether there is a reason to add predictors at that level to try to explain the variance. This model had no predictors of the depressive symptoms outcome. The test of this model revealed that both within-person ( $\sigma^2 = 12.13$ ,  $SE = .84$ ,  $p < .001$ ) and between-person ( $\sigma^2 = 55.96$ ,  $SE = 32.98$ ,  $p < .05$ ) variance components were significant. The intra-class correlation coefficient, a measure of the relative strength of both variance components, was .81

showing that a large amount of the variance in depressive symptoms was due to between-person differences.

Table 3. Multi-level Model Results: Baseline Models

	<u>Unconditional Means Model</u>		<u>Unconditional Growth Model</u>	
	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>
<i>Initial Status</i>	4.82	18.13***	1.94	1.63
<i>Rate of Change</i>			.22	2.48*
<i>Variance Components</i>	<i>B</i>	<i>Z</i>	<i>B</i>	<i>Z</i>
Within-person	13.13	15.57***	13.21	15.52***
In initial status	55.96	1.70*	43.88	1.37~
In rate of change	.44	2.54**	.38	2.26*
Covariance	-4.59	-1.95~	-3.74	-1.64

~ $p < .10$ ; \* $p < .05$ ; \*\*  $p < .01$ ; \*\*\* $p < .001$

The purpose of the unconditional growth model is to determine whether between-person variance is due to differences in individuals' initial status (intercept) or linear change trajectory (slope). In this model, age was used as the predictor. Results show that the variance due to differences in initial status was not significant ( $\sigma^2 = 43.88$ ,  $SE = 32.04$ , *ns*), but variance due to differences in rates of change was significant ( $\sigma^2 = 13.21$ ,  $SE = .85$ ,  $p < .001$ ). In addition, this model showed that intercepts did not significantly covary with changes in depression ( $\sigma^2 = -3.74$ ,  $SE = 2.28$ , *ns*). That is, there was not a systematic relation between the level of depressive symptoms that youths endorsed when they entered the study and changes in depressive symptoms that occurred over the five years. This model also quantified the effects of age on

depressive symptoms and showed that with each increasing year, depression scores increased by .22 units.

*Substantive Models.* Separate models were tested for each type of stressor. Level – 1 (time-varying predictors) included in these models were stress (total, interpersonal, or achievement), negative cognitions, and the lagged depression scores. Level – 2 (time-invariant predictors) included risk, gender, person-centered mean cognitions, and person-centered mean stress (total, interpersonal, or achievement).

Results of the model testing the two-way interaction between total stress and negative cognitions indicated a significant interaction ( $B = -.28, SE = .08, p < .001$ ). Figure 1 shows that youth with more negative cognitive styles had higher levels of depression than youth with more positive cognitive styles. Among youth with more negative cognitive styles, those with higher levels of total stressors reported even higher levels of depressive symptoms than those with fewer stressors. Simple slopes tests revealed that the relation between stress and depression was significant at high levels of cognitive vulnerability ( $z = 4.72, p < .01$ ) and non-significant at low levels of cognitive vulnerability ( $z = .58, ns$ ).

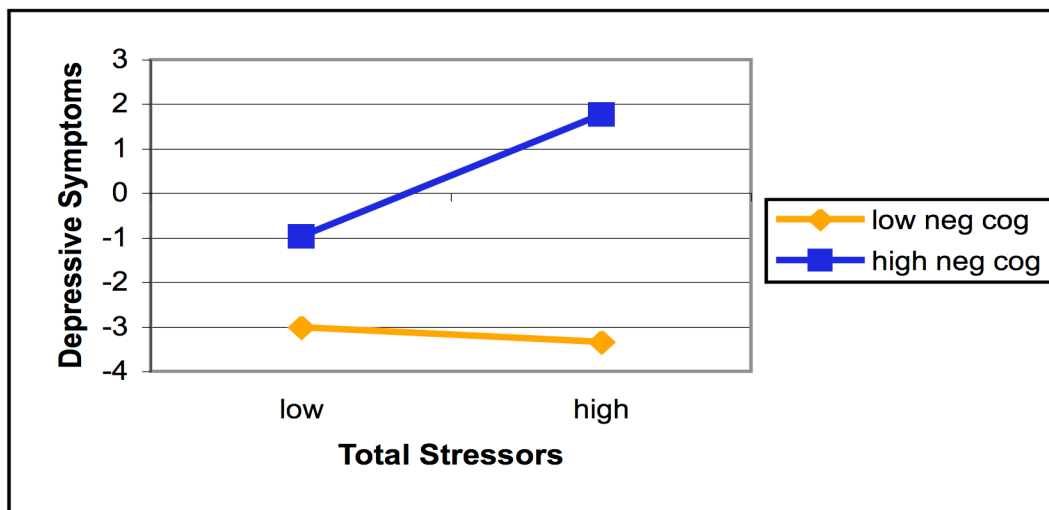


Figure 1. Interaction of Total Stressors and Negative Cognitions

Table 4. Multi-level Model Results: 2-way and 3-way Interactions

Three-way Interactions						
	Total		Interpersonal		Achievement	
	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>
Initial status	-1.92~	-1.69	-1.65	-1.46	-1.60	-1.38
<b>Level 1</b>						
Age	.13~	1.67	.11	1.42	.10	1.30
Prior year CDI	-.20***	-5.22	-.21***	-5.28	-.20***	-4.99
Stress	-.05	-.20	-.12	-.48	1.49	1.30
Cognitions	-.80	-.98	-.79	-.98	-.65	-.80
Stress x Cognitions	.32	.97	.21	.55	-2.81	-1.60
Gender x Stress	.15	1.13	.19	.15	-1.02	-1.38
Gender x Cognitions	-.16	-.32	-.16	-.33	-.21	-.43
Gender x Stress x Cognitions	-.35~	-1.92	-.30	-1.40	1.29	1.13
<b>Level 2</b>						
Risk	-.07	-.53	-.05	-.39	-.05	-.36
Gender	.08	.59	.06	.49	.08	.66
Two-way Interactions						
Initial status	-1.87~	-1.65	-1.66	-1.46	-1.63	-1.41
<b>Level 1</b>						
Age	.13~	1.70	.12	1.50	.11	1.43
Prior year Depression (CDI)	-.21***	-5.24	-.21***	-5.30	-.20***	-5.08
Stress	.19	3.04	.19**	2.80	.03	.07
Cognitions	-1.11***	-4.64	-1.09***	-4.53	-1.00***	-4.11
Stress x Cognitions	-.28***	-3.37	-.29**	-2.93	-.98~	-1.72
<b>Level 2</b>						
Risk	-.03	-.25	-.04	-1.46	-.03	-.24

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

CDI = Children's Depression Inventory

Similar results were found for interpersonal stressors. The interpersonal stress by negative cognitions interaction was significant ( $B = -.29$ ,  $SE = .10$ ,  $p < .01$ ). Figure 2 shows that those with more negative cognitions and higher levels of interpersonal stress had higher levels of depressive symptoms compared to youth with more negative cognitions and lower levels of interpersonal stress. Regardless of their levels of stress, youth with more negative cognitions had higher levels of depressive symptoms than youth with less negative cognitions. Simple slopes tests revealed that the relation between stress and depression was significant at high levels of

cognitive vulnerability ( $z = 4.04, p < .01$ ) and non-significant at low levels of cognitive vulnerability ( $z = .55, ns$ ).

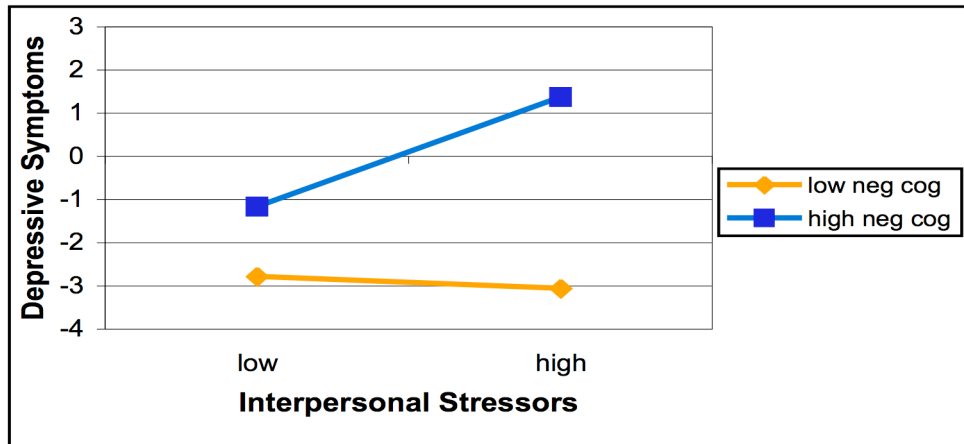


Figure 2. Interaction of Interpersonal Stressors and Negative Cognitions

The two-way interaction between achievement stressors and negative cognitions showed a nonsignificant trend ( $B = -.98, SE = .57, p < .09$ ). Among youth with high levels of cognitive vulnerability, those with high levels of achievement stress had higher levels of depressive symptoms. Those with lower levels of cognitive vulnerability and higher levels of achievement stress had lower levels depressive symptoms. Simple slopes tests revealed that the relation between achievement stress and depression was non-significant at all levels of cognitive vulnerability.

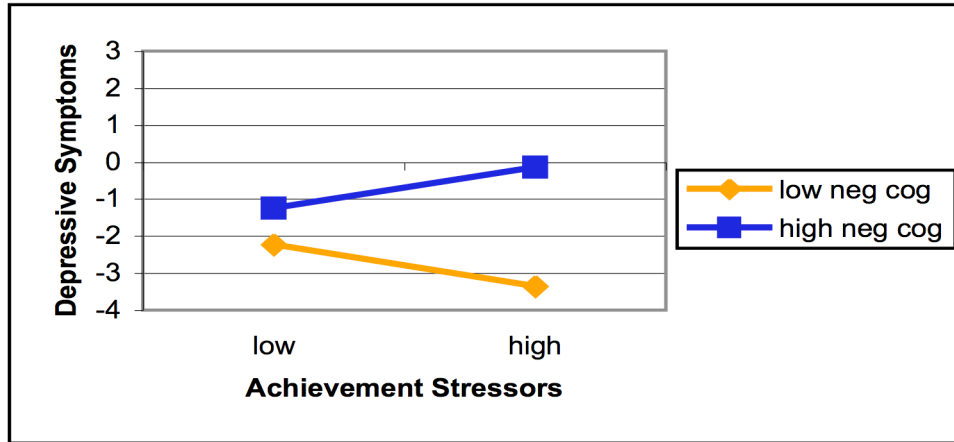


Figure 3. Interaction of Achievement Stressors and Negative Cognitions

The three-way interaction of total stress, negative cognitions, and gender showed a nonsignificant trend ( $B = -.35$ ,  $SE = .18$ ,  $p < .06$ ). Plotting this interaction (see Figure 4) showed that among adolescents with high levels of stress, a more negative cognitive style significantly predicted high levels of depressive symptoms in girls, but not boys. Among youth with low levels of stress, more negative cognitions predicted high levels of depressive symptoms for both boys and girls. Simple slope analyses revealed that for girls, the relation between stress and depression was significant at high levels of cognitive vulnerability ( $z = 4.54$ ,  $p < .01$ ), but not at low levels of cognitive vulnerability ( $z = .98$ ,  $ns$ ). For boys, the relation between stress and depression was not significant at either high ( $z = .84$ ,  $ns$ ) or low ( $z = .46$ ,  $ns$ ) levels of cognitive vulnerability. Gender did not significantly moderate the relations among interpersonal or achievement stressors, cognitions, and depression (see Table 4).

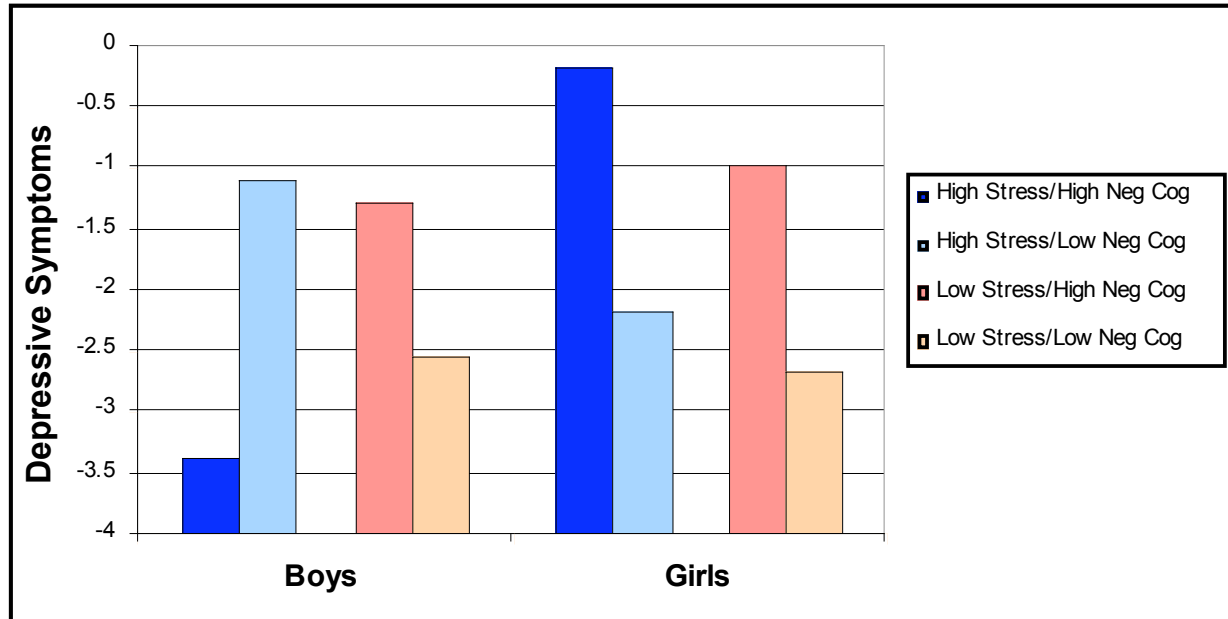


Figure 4. Interaction of Gender, Total Stressors, and Negative Cognitions

#### *Discrete-Time Hazard Models*

Discrete-time hazard modeling was used to test the prediction of the first onset of major depressive disorder. Seventeen participants were removed from the original data set due to their having a history of depressive disorders or being in a current episode at study entry. Thus, the hazard function modeled the probability of participants experiencing a depressive episode [Depression Rating Scale (DSR) score of  $\geq 4$ ] at any point during the five years.

The predictors of the hazard function varied slightly from those of the depressive symptoms trajectory due to differences in modeling methodology. Participants' cognitive style at study entry was used as the sole cognitive predictor in DTHM and participants' mean monthly stress ratings (total, interpersonal, achievement) were used as the stress predictors. The time metric for DTHM was month in the study and thus 70 variables were dummy-coded to model months. Gender and risk were used as predictors as well.



Because of the large number of time periods in the current study, several alternative specifications for time were compared with the goal of finding a parsimonious time specification that fit the data well (Singer & Willett, 2003). The completely general model that included all 70 month variables was compared to a constant model that constrained hazard to be constant over time, the linear model that allows hazard to increase over time, and then the quadratic, cubic, fourth order, and fifth order polynomials. Parameters, deviance statistics, and Akaike Information Criterion (AIC; Akaike, 1973) statistics for each time specification are presented in Table 5. Chi-square comparisons showed that the quadratic model was the most parsimonious and provided a good fit to the data. Thus, the baseline model for the depression hazard included the month and the squared month variables.

Table 5. DTHM Time Comparisons

<i>TIME</i>	<i>n</i> parameters	Deviance	<u>Deviance difference in comparison to</u>		
			Previous model	General model	AIC
General	70	890.65			1044.66
Constant	1	859.53	31.12	31.12	861.53
Linear	2	858.3	1.23	32.35	862.3
Quadratic	3	850.46	7.84	40.19	856.46
Cubic	4	850.39	0.07	40.26	858.39
Fourth order	5	843.66	6.73	46.99	853.66
Fifth order	6	842.33	1.33	48.32	854.33

The hazard function was then modeled as a function of the set of control and substantive predictors. Parallel analyses were run separately for each type of stressor. In these models,

hazard was modeled as a function of gender, risk, Grade 6 cognitive vulnerability and monthly stress scores as well as the interaction between cognitive vulnerability and stress. In the total stress model, the time variables, risk, and total stress were significant predictors of the hazard function; the interaction between total stress and cognitive vulnerability was not significant. No interactions were found for the interpersonal or achievement stress models (see Table 6).

Another series of models was tested to examine whether gender moderated the effects of stress and cognitions on depression. The main effects of gender, risk, Grade 6 cognitions, and mean monthly stress ratings were included as were the two-way interactions between cognitions and stress, cognitions and gender, and stress and gender as well as the three-way interaction among cognitions, stress, and gender. In the total stress model, the time variables risk and total stress significantly predicted the hazard. In the interpersonal stress model, the time variables and risk significantly predicted the hazard. The achievement model did not converge (see Table 6).

Finally, the most parsimonious model, which included only the effects of time, risk, and stressors, was tested. Consistent with the patterns seen in the more complex models, time, risk, and stress predicted the hazard function for each of the three indices of stress. The nature of the effect was identical across stressor types. Participants whose mothers had histories of depressive disorders had increased odds of developing depression over the course of the study (odds ranging from 3.18 to 8.88). In addition, for every one unit increase in the mean monthly stress score, the odds of developing a depressive disorder increased by 1.22 for total stress, 1.19 for interpersonal stress, and 1.22 for achievement stress.

Table 6. DTHM Results: 3-way Interactions, 2-way Interactions, and Main Effects of Stress Controlling for Risk

	Three-way Interactions					
	Total		Interpersonal		Achievement	
	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>	<i>B</i>	<i>t</i>
Intercept	-9.81***	1.06	-8.83***	.99		
Stress	.16*	.06	.09	.08		
Cognitions	-.56	.69	-.37	.57		
Stress x Cognitions	.08	.07	.08	.08		
Gender x Stress	.03	.04	.05	.05		
Gender x Cognitions	.44	.46	.22	.38		
Gender x Stress x Cognitions	-.07	.04	-.06	.05		
Risk	2.37**	.73	2.43***	.73		
Gender	-.20	.40	-.25	.34		
Month	.10**	.03	.08**	.03		
Month x Month	.00**	.00	.00*	.00		
Two-way Interactions						
Intercept	-10.20***	.94	-9.30***	.92	-9.25***	.92
Stress	.20***	.02	.17***	.02	.19	.08
Cognitions	.04	.22	-.10	.18	-.13	.14
Stress x Cognitions	-.02	.02	.00	.02	.10	.11
Risk	2.28***	.73	2.41***	.73	2.72***	.72
Gender	.13	.26	.04	.25	.25	.25
Month	.10***	.03	.08**	.03	.08**	.03
Month x Month	.00**	.00	.00**	.00	.00**	.00
Main Effects of Stress						
Intercept	-10.05***	.93	-9.27***	.91	-9.25***	.92
Stress	.20**	.02	.17**	.02	.20**	.07
Risk	2.29***	.72	2.46***	.72	2.78***	.72
Gender	.05	.25	.00	.00	.23	.25
Month	.10**	.03	.08**	.03	.08**	.03
Month x Month	.00**	.00	.00**	.00	.00**	.00

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

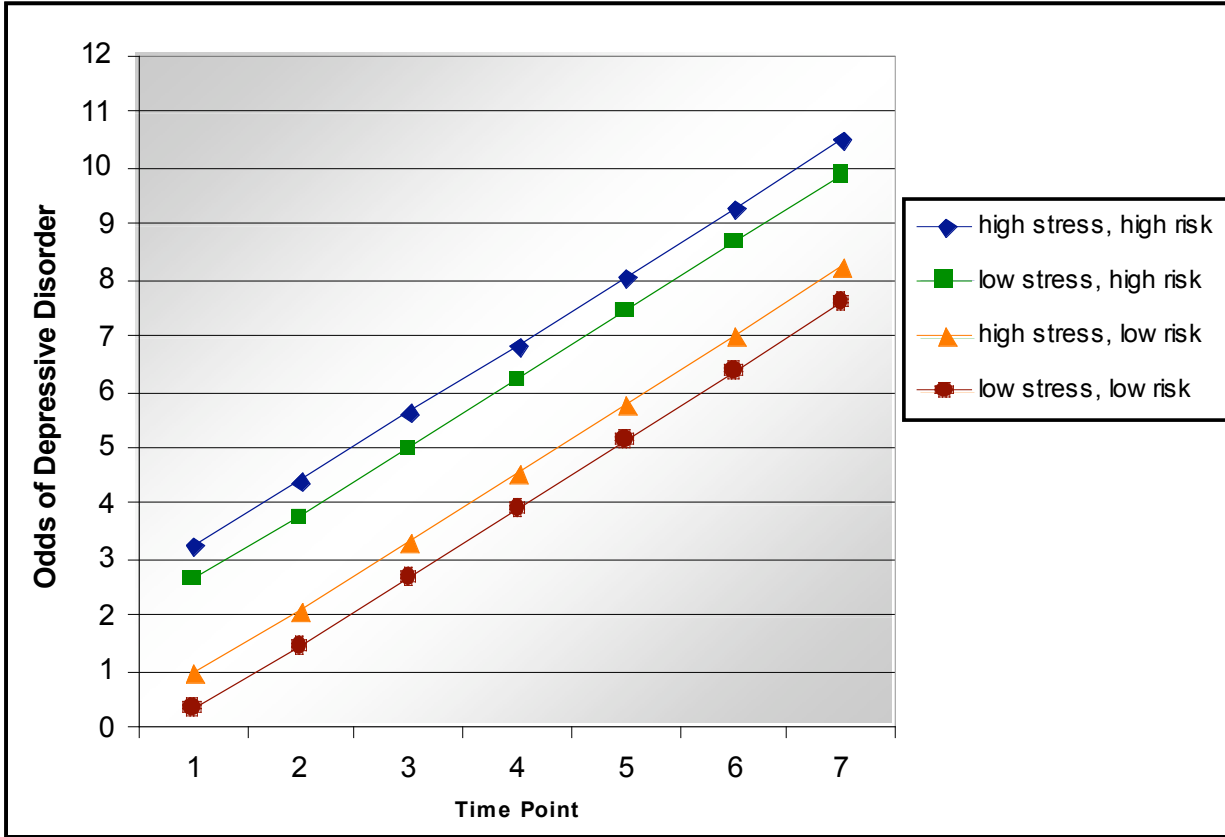


Figure 5. Odds of Developing a Depressive Disorder across Adolescence - Total Stress

## CHAPTER IV

### DISCUSSION

The current study examined the moderating effects of negative cognitions on stressors in the prediction of both depressive symptoms and diagnoses over a five-year period of adolescence. The levels of overall stressors as well as interpersonal and achievement stressors were examined in separate models in relation to a composite cognitive variable comprised of attributional style and global self-worth. Gender also was examined as another potential moderator of the cognitive diathesis-stress interaction.

With regard to the cognitive-stress interaction model, we found that negative cognitions significantly interacted with total level of stressors to predict change in depressive symptoms. That is, among youth with more negative cognitions, higher levels of total stressors significantly predicted higher levels of depressive symptoms, controlling for prior depression levels. These results are consistent with cognitive-stress models of depression (Abramson et al., 1989; Beck, 1967).

Regarding specific stressor types, we also found a significant interaction between interpersonal stressors and negative cognitions. This finding is consistent with studies that have focused on interpersonal stressors such as peer rejection (Panak & Garber, 1992). In contrast to others studies (Prinstein & Aikins, 2004; Prinstein et al., 2005), however, the current study did not find gender differences in the interaction between negative cognitions and interpersonal stressors predicting depressive symptoms.

The findings for achievement stressors differed from those for total and interpersonal stressors. At high levels of achievement stress, high levels of negative cognitions, predicted high levels of depressive symptoms, whereas low levels of negative cognitions predicted low level of depressive symptoms. Thus, in the context of high levels of achievement stress, one's cognitive style may either exacerbate or buffer the effects of such stress on depression levels. These findings converge with another study of an achievement stressor (i.e., getting a poorer grade than one had hoped for) (Hilsman & Garber, 1995), although that study did not find differences in depression levels for participants with lower levels of negative cognitions.

With regard to predicting depressive disorders, consistent with the literature (e.g., Beardslee et al., 1998; Downey & Coyne, 1990; Goodman & Gotlib, 1999), we found that offspring of depressed mothers (high risk) had significantly greater odds of having a first onset of a depressive disorder over the course of the five years of the study than children of nondepressed mothers (low risk). In addition, levels of stressors (total, interpersonal, achievement) significantly predicted the onset of depressive disorders over and above the significant effects of risk. That is, mean stress scores predicted increased odds of developing depressive diagnoses, and the strength of this relation was similar for all three types of stressors. This study adds to the literature by examining the joint effects of risk and stress for the development of depressive disorders over a longer period of time than has been studied previously.

The cognitive-stress interaction, however, did not significantly predict the onset of depressive disorders when using the cognitions measured at Time 1 (i.e., 6<sup>th</sup> grade) and subsequent stressors. This result is consistent with the two others studies that also did not find that cognitions moderated the effect of stress on depressive diagnoses among offspring of

depressed mothers (Hammen, 1988; Hammen et al., 1988), although contrary to the Lewinsohn et al. (2001) study that showed that the cognitive-stress interaction predicted depressive disorders.

There may be several reasons for not finding that the cognitive-stress interaction significantly predicted depressive disorders in the current study. First, the measure of the cognitive vulnerability used in these analyses was assessed at Time 1 (Grade 6) rather than monthly across all five years. The auto-correlations of the cognitive variable across time showed only moderate stability. Thus, it is quite possible that negative cognitions assessed in 6<sup>th</sup> grade would not be a powerful predictor of depression several years later. Future tests of the cognitive-stress interaction in youth should measure cognitions as frequently as stressors to provide a more sensitive and temporally linked measure of cognitive vulnerability over time.

Second, the particular cognitive measures used in this study might not have been the best indices of the cognitive constructs of interest. Other measures of attributional style (Conley et al., 2001), inferential style (Hankin & Abramson, 2002), cognitive errors (Leitenberg, Yost, & Carroll-Wilson, 1986), and dysfunctional attitudes (Lewinsohn et al., 2001) might have yielded different results. Lewinsohn et al., for example, found that for individuals who had experienced negative life events, higher levels on the measure of dysfunctional attitudes predicted the occurrence of a major depressive disorder.

Third, the cognitive-stress model of depression may not apply equally well to depressive symptoms and depressive diagnoses. In contrast to the current study, the one other study that tested both diagnoses and symptoms found a significant cognition by stress interaction for depressive diagnoses, but not symptoms (Lewinsohn et al., 2001). The current study differed from the Lewinsohn study, however, with regard to the measures of cognitions and stress, and

the ages of the adolescent participants. Moreover, depressive diagnoses are less prevalent than are depressive symptoms (Avenevoli & Steinberg, 2001), and hence the absence of a significant cognitions by stress interaction predicting depressive disorders might be partially due to the greater variance in symptoms than diagnoses. If future studies replicate the findings of the current study, then this might indicate that there is a discontinuity from depressive symptoms to diagnoses with respect to the cognitive-stress model of depression (Compas et al., 1993).

Finally, we examined whether gender moderated the cognitive diathesis-stress interaction in the prediction of depressive symptoms and diagnoses. There was a nonsignificant trend for the interaction of gender with cognitions and total stressors to predict increases in depressive symptoms over time. The differences between males and females were most evident at high levels of stress, such that among adolescents with high stress and a more negative cognitive style, females had higher levels of depressive symptoms than males. Gender differences were not evident at low levels of stress, however. This finding highlights factors that might contribute to girls' greater likelihood than boys of developing depressive symptoms during adolescence. Even though girls and boys shared similar levels of risk factors (i.e., negative cognitions and stressors), girls showed higher levels of depressive symptoms in the face of these risk factors than did boys. This result is consistent with other studies showing that in the context of similar levels of stressors, girls are more likely than boys to experience depressive symptoms (Achenbach, Howell et al., 1995; Ge, Lorenz et al. 1994; Hankin, Mermelstein et al., 2007; Rudolph, 2002). No interactions among gender, negative cognitions, and stress were found to predict the onset of depressive diagnoses.

The current prospective study was the first to use multi-level modeling to test the cognitive diathesis-stress model of depression across five years of adolescence. This modeling



technique resulted in increased power to detect effects, the ability to model individual trajectories of depression rather than just change scores, and the ability to take an idiographic approach to the test of this model. The idiographic approach provides a test of the model that is more in line with cognitive theories of depression (Abramson et al., 1989; Beck, 1967). Rather than comparing each individual's scores on measures to the mean score for the entire sample to determine participants' stress level, the current study modeled each individual's scores separately. In ordinary least squares regression, individuals are considered to be experiencing high levels of stress if their scores are above the group mean, and low levels of stress if their scores are below the group mean. However, this way of operationalizing stress fails to consider the context of each participant's own lives by comparing them to others rather than to themselves.

The current study was also the first to use discrete-time hazard modeling (DTHM) to test the cognitive diathesis-stress model in adolescents. The DTHM method is based on the logistic regression model used to predict the odds of experiencing categorical outcomes, but it takes into account the censored observations that occur when not all participants have experienced the target event (e.g., a depressive episode) before the end of study. These analyses showed the particularly strong relation between stress and the first onset of depressive disorders in adolescents, which has been noted elsewhere in discussions of the stress sensitization and kindling hypotheses (e.g., Monroe & Harkness, 2005). According to the kindling hypothesis, first onsets of depression are strongly predicted by stressors, whereas subsequent episodes of depression are less closely tied to stressors. It is possible that the interaction between stress and cognitions is more predictive of recurrences of depression rather than initial episodes.

One limitation of these analyses, however, was that stressors for each month predicted the odds of developing depression in that same month. Thus, it is impossible to determine from this whether the onset of the stressor preceded the onset of the depressive disorder or vice versa. However, we obtained the dates of the stressors and the onset of the depressive disorders, thereby allowing us to examine the timing of each in relation to the other. Results revealed that in 93 percent of the cases, the stressor began before the depressive episode. Thus, stressors clearly were an important and powerful predictor of the onset of depressive disorder.

Another limitation of this study was that only self-reports of the cognitive vulnerability and depressive symptoms were used. Other measures of cognitions such as interviews or laboratory based methods should be further tested, especially given that prior studies that used laboratory assessments of cognitions did not find evidence consistent with the cognitive-stress theory (Hammen, 1988; Hammen et al., 1988). Moreover, the relation between negative cognitions and depressive symptoms could have been inflated due to shared method variance. In contrast, in the current study depressive disorders were diagnosed by clinicians based on separate interviews with the adolescent and mother. Negative cognitions did not predict the onset of depressive disorders across the five years, although this could have been due to our having used the measure of cognitions obtained at the first assessment rather than using measures of cognitions obtained across the study.

A strength as well as a limitation of the current study was that participants were recruited so as to over-sample offspring of mothers with histories of depression (high risk). This strategy was used in order to increase the variability on the measures of interest, but the results may not generalize to a purely community sample. Moreover, the focus on maternal depression limits our

ability to generalize the findings to paternal depression, which also has been found to be linked with child psychopathology also (e.g., Connell & Goodman, 2002; Kane & Garber, 2004).

Whereas risk did not contribute to a significant portion of the variance in adolescents' levels of depressive symptoms, it did significantly predict increased odds of the first onset of a depressive disorder. Thus, having a mother with a history of depression increases the chances of having a depressive episode during adolescence (e.g., Beardslee et al., 1998; Goodman & Gotlib, 1999), but may be less linked with fluctuations in depressive symptoms during this age period, which tend to be quite high (e.g., Albert & Beck, 1975; Twenge & Nolen-Hoeksema, 2002).

As with any longitudinal study, some participants were lost over the five years. Attrition analyses revealed that those who dropped out of the study had higher levels of achievement stress at wave one and were more likely to be male than female. This might have biased the results and reduced the power to find significant effects for achievement stress on depression by reducing its variability in the remaining sample. The higher attrition of males may have affected our ability to detect gender differences.

Although environmental stress is an essential component of many developmental psychopathology theories (Mash & Barkley, 2003; Monroe & Hadjiyannakis, 2002), there are other vulnerabilities besides negative cognitions that also may moderate the stress-depression relation. Other potential risk factors might include low levels of social support (Abela & Sullivan, 2003), and personality and temperament characteristics such as neuroticism (e.g.; Compas, Connor-Smith, & Jaser, 2004) and interpersonal neediness (e.g. Little & Garber, 2005). In particular, interpersonal vulnerabilities such as neediness, excessive reassurance-seeking, and lack of social support (Compas et al., 1986; Connor-Smith & Compas, 2002; Joiner, 1999) may be especially important in the context of interpersonal stressors. Developmentally sensitive and

integrative models such as the one proposed by Hankin and Abramson (2001) provide a useful framework for such future research.

The potential role of protective factors in the stress-depression relation also should be investigated. Researchers disagree regarding whether the presence of protective factors are distinct from the absence of risk factors and whether protective factors are relatively stable traits or dynamic processes (Luthar, Cicchetti, & Becker, 2000). Nevertheless, research has shown that problem-focused coping strategies decrease the strength of the association between stressors and depression (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Compas, Malcarne, & Fondacaro, 1988). Thus, various types of coping strategies and other factors associated with resilience in youth also should be integrated into more developmentally-sensitive models of depression.

Clinical implications of the current study are that treatment and prevention efforts should help youth cope with stressors. These interventions should especially focus on interpersonal stressors as the current study showed that such stressors are particularly related to depressive symptoms in adolescents. Indeed, there is growing evidence of the efficacy of interventions for treating and preventing depression in youth that emphasize interpersonal communication (Young, Mufson, & Davies, 2006) and social skills (Gillham, Hamilton, Freres, Patton, & Gallop, 2006; Reinecke, Ryan, & Dubois, 1998). Interventions that combine both cognitive and interpersonal approaches likely hold the most promise for treating and preventing depression (Garber, 2006; Jaycox, Reivich, Gillham, & Seligman, 1994).

In conclusion, this study tested the cognitive diathesis-stress theory of depression in adolescents. Negative cognitions (attributional style and self-worth) significantly moderated the effect of total and interpersonal stress on depressive symptoms, but not diagnoses. Gender

tended to moderate the effects of cognitions on total stressors in the prediction of depressive symptoms. Main effects of total, interpersonal, and achievement stressors in conjunction with risk (i.e., maternal depression) significantly predicted the first onset of depressive disorders. Thus, stressors predicted both depressive symptoms and depressive diagnoses highlighting their central role in predicting depression across different levels.

APPENDIX A

MONTHLY TOTAL, INTERPERSONAL, AND ACHIEVEMENT STRESSORS AS A  
FUNCTION OF RISK STATUS

	Total Stressors			Interpersonal Stressors			Achievement Stressors		
	Low	High	F	Low	High	F	Low	High	F
Month 1	.79	1.89	5.31*	.11	1.02	6.54*	.10	.15	.11
Month 2	1.94	3.20	4.03*	.40	1.91	8.82**	.23	.16	.17
Month 3	1.54	3.82	11.17**	.61	2.26	8.64**	.13	.12	.00
Month 4	1.73	3.98	10.04**	.78	2.63	10.33**	.41	.07	3.79
Month 5	1.78	4.49	12.25**	.92	3.03	12.15**	.35	.24	.26
Month 6	1.61	4.81	14.32***	.99	3.22	12.72***	.40	.27	.39
Month 7	1.82	4.42	12.66***	1.38	2.91	6.10*	.16	.22	.11
Month 8	1.70	4.81	13.86***	1.24	3.06	7.61**	.19	.19	.00
Month 9	1.52	4.80	17.74***	1.02	3.31	11.49**	.25	.20	.08
Month 10	1.36	4.03	12.88***	.93	2.83	8.59**	.09	.20	.74
Month 11	.69	3.25	15.58***	.60	2.18	8.71**	.00	.18	2.24
Month 12	.80	2.66	8.85**	.75	1.64	4.70	.00	.23	1.64
Month 13	.98	2.29	5.06*	.70	1.57	3.50	.07	.19	.51
Month 14	1.29	2.44	3.89	.90	1.71	2.87	.10	.09	.02
Month 15	.89	3.05	12.12**	.57	2.20	9.45**	.05	.11	.25
Month 16	1.02	3.24	12.19**	.58	2.47	11.18**	.03	.14	1.27
Month 17	1.62	3.03	5.74*	.72	2.38	10.51**	.13	.14	.00
Month 18	1.55	3.04	5.49*	.73	2.46	8.89**	.27	.19	.00
Month 19	1.06	3.06	11.79**	.35	2.36	15.49***	.33	.24	.28
Month 20	.89	3.11	15.91***	.09	2.39	20.77***	.45	.25	1.03
Month 21	.80	2.67	12.18**	.30	2.02	12.65***	.20	.19	.01
Month 22	.67	2.81	14.75***	.42	2.09	11.21**	.00	.21	1.79
Month 23	.53	2.74	15.93***	.35	2.10	13.50***	.00	.15	1.59
Month 24	.48	2.73	18.75***	.12	2.20	18.95***	.15	.15	.00
Month 25	1.15	3.15	12.80***	.21	2.15	16.27***	.11	.10	.01
Month 26	1.30	3.41	14.27***	.33	2.08	14.47***	.11	.19	.35
Month 27	1.22	3.65	15.97***	.36	2.20	14.91***	.05	.22	.79
Month 28	1.21	3.51	14.21***	.42	2.08	11.48**	.02	.23	2.12
Month 29	1.06	3.09	10.79**	.55	2.04	8.10**	.08	.15	.36
Month 30	1.09	2.65	7.88**	.65	1.89	6.83*	.22	.12	.54
Month 31	1.52	2.85	4.90*	1.02	2.06	4.24*	.21	.15	.22
Month 32	1.83	3.02	3.43	1.08	2.29	4.53*	.09	.21	.68
Month 33	1.30	2.76	5.99*	.63	2.09	7.26**	.08	.18	.71
Month 34	.91	2.54	8.47**	.40	1.91	8.59**	.13	.11	.03
Month 35	1.02	2.53	7.45**	.69	1.91	5.64*	.04	.13	.93
Month 36	1.10	2.55	6.50*	.78	1.95	5.03*	.17	.17	.00
Month 37	1.06	2.48	6.32*	.74	1.89	5.16*	.19	.10	.43
Month 38	1.15	2.86	7.08**	.76	2.05	5.42*	.22	.20	.01
Month 39	1.13	2.78	5.61*	.85	1.96	3.37	.02	.23	1.36
Month 40	1.22	2.59	4.79*	.97	1.89	2.76	.09	.13	.19
Month 41	1.07	2.63	6.88**	.69	1.89	5.21*	.07	.15	.32

Month 42	1.31	2.85	6.50*	.55	2.13	8.62**	.09	.09	.00
Month 43	1.39	2.84	5.24*	.72	2.00	5.92*	.07	.08	.02
Month 44	1.35	2.21	2.56	.86	1.51	2.08	.08	.11	.07
Month 45	.63	2.18	11.44**	.52	1.47	5.99*	.08	.16	.37
Month 46	.90	2.43	9.08**	.57	1.61	6.15*	.11	.24	.58
Month 47	1.12	2.33	5.55*	.70	1.61	3.94*	.11	.15	.14
Month 48	1.30	2.62	5.66*	.99	1.93	4.07*	.00	.05	.95
Month 49	1.70	2.76	3.38	1.20	1.88	2.11	.10	.12	.04
Month 50	2.19	2.74	.75	1.50	1.74	.24	.11	.09	.09
Month 51	2.22	2.87	.95	1.68	1.88	.14	.10	.10	.00
Month 52	1.76	2.68	2.17	1.30	1.87	1.27	.04	.13	1.26
Month 53	1.25	2.59	5.12*	.88	1.83	3.51	.04	.17	1.39
Month 54	.97	2.58	7.83**	.52	1.95	8.42**	.16	.05	1.10
Month 55	1.31	2.40	3.46	.78	1.79	4.08*	.25	.03	4.46*
Month 56	.77	2.45	8.61**	.43	1.88	7.89**	.10	.06	.36
Month 57	.60	.54	8.93**	.40	2.05	7.35**	.02	.07	.85
Month 58	1.05	2.17	3.72	.41	1.67	5.68*	.10	.09	.01
Month 59	1.29	2.28	3.05	.76	1.64	3.37	.06	.03	.17
Month 60	.82	2.40	7.48**	.69	1.86	5.25*	.00	.07	1.46
Month 61	.84	2.24	5.84*	.81	1.64	2.74	.00	.09	1.25
Month 62	1.05	2.33	4.50*	.84	1.68	2.76	.03	.10	.90
Month 63	1.65	2.50	1.86	1.17	1.80	1.34	.11	.09	.03
Month 64	1.44	2.67	3.54	.82	1.95	4.05	.05	.02	.58
Month 65	1.80	2.61	1.58	1.16	1.89	1.71	.05	.09	.32
Month 66	1.99	2.76	1.28	1.40	2.05	1.16	.00	.12	1.70
Month 67	1.90	2.96	2.45	1.39	2.10	1.58	.00	.19	2.47
Month 68	1.59	3.06	4.52*	1.24	2.05	2.29	.00	.28	3.00
Month 69	1.52	3.03	4.52*	1.19	2.09	2.45	.00	.27	3.05
Month 70	1.32	2.75	3.89	.90	1.96	4.20*	.00	.30	2.34
Month 71	1.02	2.59	5.08*	.71	1.95	5.72*	.00	.22	1.92
Month 72	1.08	2.44	4.96*	.78	1.74	3.91*	.00	.20	2.19
Month 73	.77	1.81	3.80	.49	1.32	3.71	.00	.10	1.21
Month 74	.24	1.57	8.49**	.14	1.10	7.14**	.00	.08	.92
Month 75	.27	1.06	4.24*	.19	.73	3.25	.00	.05	.51
Month 76	.09	.95	6.04*	.01	.65	6.56*	.00	.04	.38
Month 77	.04	.86	5.82*	.04	.57	4.84*	.00	.09	1.13
Month 78	.06	.77	4.55*	.04	.44	3.03	.00	.06	.57
Month 79	.00	.69	5.19*	.00	.35	2.94	.00	.09	1.15
Month 80	.00	.48	3.15	.00	.31	2.27	.00	.05	.52

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$



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