

# Predicting Adolescents' Organized Activity Involvement: The Role of Maternal Depression History, Family Relationship Quality, and Adolescent Cognitions

Amy M. Bohnert

*Loyola University Chicago*

Nina C. Martin

*University of Illinois at Chicago*

Judy Garber

*Vanderbilt University*

Although the potential benefits of organized activity involvement during high school have been documented, little is known about what familial and individual characteristics are associated with higher levels of participation. Using structural equation modeling, this longitudinal study examined the extent to which maternal depression history (i.e., risk), family relationship quality, and adolescents' cognitions (i.e., self-worth and attributional style), predicted organized activity involvement during high school among 145 adolescents, controlling for socioeconomic status and adolescent depressive symptoms. Results showed that risk predicted less adolescent high school activity involvement, and this relation was mediated by family relationship quality. Family relationship quality indirectly affected activity involvement through adolescent cognitions. The overall predictive model generally supported the importance of the interplay between family and individual factors in predicting activity involvement during high school.

Adolescents typically have many opportunities to participate in a variety of organized after-school activities both at school and in their communities. Activity participation has been associated with lower rates of early school dropout (Mahoney & Cairns, 1997), fewer criminal arrests during early adulthood (Mahoney, 2000), less alcohol and marijuana use (Elder, Leaver-Dunn, Wang, Nagy, & Green, 2000), better educational outcomes (e.g., Cooper, Valentine, Nye, & Lindsay, 1999; Eccles & Barber, 1999), and lower levels of depressed mood (Mahoney, Schweder, & Stattin, 2002). Although activity involvement has demonstrated benefits, little is known about what individual and family characteristics predict such involvement. The current study tested a prospective mediational model in which both the quality of family relationships and adolescents' cognitions predicted organized activity involvement during high school (see Figure 1). To increase the variability of family relationship quality and adolescent cognitions, we tested this model in a sample of adolescents whose mothers differed with regard to their histories of depressive disorders.

The importance of parenting practices and individual characteristics in adolescents' achievement and activity choices has been highlighted in the comprehensive expectancy-value model of Eccles et al. (1983). Elaborating on the parental socialization aspects of this model, Jacobs and Eccles (2000) suggested that parents may influence their children's activity choices through their general parenting style and the socio-emotional environment they provide for their children. Indeed, adolescents with family relationships characterized by high levels of parental involvement, engagement, and connectedness as well as low levels of conflict have been

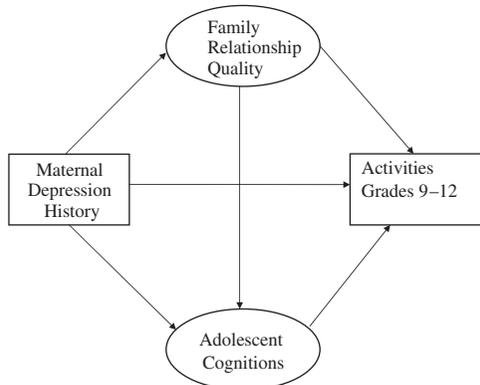


FIGURE 1 Hypothesized path model predicting adolescents' organized activity involvement in high school.

found to be more involved in organized activities compared with adolescents with less favorable family environments (e.g., Fletcher, Edler, & Mekos, 2000; Fletcher & Shaw, 2000; Mahoney et al., 2002).

Family relationship quality and parenting practices are often compromised when a parent is depressed (e.g., Goodman & Gotlib, 1999; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). For example, depressed mothers have been found to have difficulty nurturing and supporting their children's interests (Goodman & Gotlib, 1999; Webster-Stratton & Hammond, 1988), tend to be more hostile, and are more likely to engage in conflictual and coercive interactions with their children than are nondepressed mothers (Conger, Patterson, & Ge, 1995; Harnish, Dodge, Valente, & Conduct Problems Prevention Research Group, 1995; Patterson & Dishion, 1988; Patterson & Bank, 1989). Accordingly, adolescent offspring of depressed mothers may participate in fewer organized activities due to poor patterns of parent-adolescent communication or a lack of encouragement or emotional support from their mothers. The present study examined the extent to which maternal depression history was associated with lower levels of adolescent activity involvement during high school. In addition, we hypothesized that maternal depression would influence organized activity involvement by affecting the quality of the family relationship (see Figure 1).

Offspring of depressed mothers are not only at risk for experiencing poor family relationships but also are vulnerable to negative cognitions (Garber & Martin, 2002; Hammen, 1991). Children of depressed parents have been found to report a more negative attributional style (Garber & Robinson, 1997), lower self-esteem (Hirsch, Moos, & Reischl, 1985), and lower perceived self-worth (Goodman, Adamson, Riniti, & Cole, 1994), compared with offspring of never depressed mothers. Few studies, however, have examined whether such negative cognitions are related to adolescents' involvement in organized activities. Cutler (1999) found that adolescents who had lower self-worth were less involved in organized activities. It is likely that adolescents who feel bad about themselves and their abilities and have low expectations of success will be less likely to seek out and become involved in organized activities.

Adolescents' explanatory styles also may influence their activity involvement given that attributional style reflects either an optimistic or pessimistic way of approaching the world (Seligman, 1995). Thus, adolescents who interpret life events positively may be more likely to participate in activities because they expect that such involvement will result in positive outcomes. In contrast, adolescents who have a more negative attributional style may expect fewer benefits to come from engaging in organized activities. Therefore, we hypothesized that maternal depression

would affect teens' involvement in organized activities at least partially through adolescents' cognitions about themselves and life events (i.e., self-esteem and attributional style).

Family relationship quality and adolescent cognitions are themselves related to each other. Adolescents' negative cognitions may be distally affected by maternal depression, but parenting style and relationship quality may be more proximal predictors of negative cognitions (Garber & Martin, 2002). Harter (1999) suggested that negative parenting behavior characterized by rejection and punishment is related to children's development of negative self-evaluations. In addition, maternal rejection and verbal criticism have been found to be related to negative cognitions in children and adolescents (Garber & Flynn, 2001; Goodman et al., 1994; Jaenicke et al., 1987). Therefore, we hypothesized that maternal depression would predict family relationship quality, which in turn would affect adolescents' cognitions, which then would predict activity involvement. The reverse also is possible. Hence, we also tested an alternative model in which maternal depression influences adolescent cognitions that then affect family relationship quality, which predicts activity involvement.

Previous studies indicate that adolescents' activity involvement may vary by gender. Findings related to gender and overall levels of involvement during high school have been mixed, with some studies reporting greater participation for girls (Eccles & Barber, 1999) and others reporting no gender differences (Mahoney, Cairns, & Farmer, 2003). Several studies have suggested that girls tend to participate in a greater variety or breadth of activities (Eccles & Barber, 1999; Jacobs, Vernon, & Eccles, 2005) than boys. Given the diverse nature of these findings, we controlled for gender in testing the proposed model of activity involvement when it was significantly associated with the particular activity involvement outcome (i.e., breadth; mean level).

Research on activity involvement also has consistently reported that lower family socioeconomic status (SES) is associated with less involvement (e.g., McHale, Crouter, & Tucker, 2001; McNeal, 1998). SES likely influences organized participation because financial resources may limit an adolescent's ability to participate regardless of interest (Coleman, 1961; Hollingshead, 1975). Therefore, we controlled for SES in testing the proposed model of activity involvement when it was related to the activity outcome.

Finally, offspring of depressed mothers are at increased risk for experiencing depression themselves (Beardslee, Versage, & Gladstone, 1998; Goodman & Gotlib, 1999). Such depressed adolescents may be less likely to get involved in organized activities as a result of their own symptoms (e.g., anhedonia, fatigue). Given that a substantial number of the adolescents in this study were themselves at increased risk for depression due to

having a mother with a depression history, adolescents' initial level of depressive symptoms was controlled.

In summary, the purpose of the present study was to examine a prospective model testing the influence of both family and individual characteristics in predicting involvement in organized school and community-based activities during high school. In particular, we evaluated the contributions of risk (i.e., maternal depression history), family relationship quality, and adolescent cognitions to adolescents' activity involvement by examining the fit of the proposed model (see Figure 1) as well as the direct, mediated, indirect, and total effects among these variables. In addition, we explored the proposed model with regard to mean levels as well as breadth of adolescents' activity involvement across the high school years.

## METHOD

### Participants and Procedure

The current study used a high-risk research design, similar to that of Beardslee et al. (1988), Hammen (1991), and Radke-Yarrow (1998), in which mothers with histories of depression were over-sampled in order to obtain greater variability in adolescents' risk, family environment, cognitions, and activity involvement. Parents of fifth grade children from metropolitan public schools were invited to participate in a study about parents and children and asked to complete a brief health history questionnaire. Of the 1,495 parents who returned the health questionnaire, telephone screening interviews were conducted with 587 who endorsed either depression, use of antidepressants, or no psychopathology. The Structured Clinical Interview (SCID: Spitzer, Williams, Gibbon, & First, 1990) for DSM diagnoses (American Psychiatric Association, 1987, 1994) then was conducted with mothers who indicated during the screening calls that they had either a history of a mood disorder or no psychiatric problems ( $n = 349$ ). Families were excluded if the mother reported psychiatric diagnoses that did not also include a mood disorder or if either the mother or child had a serious medical condition. In the final sample ( $N = 240$ ), 185 mothers had a depressive disorder (e.g., major depressive disorder, dysthymia, adjustment disorder with depressed mood), and 55 mothers were life-time free of psychopathology. The sample was ethnically representative of the surrounding metropolitan area: 82% Caucasian, 15% African-American, and 3% Hispanic, Asian, or Native American, and predominantly lower-middle to middle class ( $M$  SES = 41.84,  $SD = 13.25$ ; Hollingshead, 1975).

A research assistant who was unaware of the mothers' psychiatric history individually administered a battery of questionnaires separately to each mother and adolescent during scheduled visits. Adolescents were first assessed when they were in sixth grade ( $M$  age = 11.86,  $SD$  = .57) and re-evaluated annually through 12th grade. Only those measures relevant to the current study are described here.

Of the 240 adolescents in the original sample, 42 did not complete the activity measure used as the outcome and 53 adolescents and/or mothers were missing one or more of the predictors used in the proposed model. Therefore, the final analytic sample included 145 adolescents (61 males, 84 females) who were similar to the original sample in terms of race (i.e., 84% Caucasian, 11% African-American, and 5% Hispanic, Asian, or Native American). No differences between the original and analytic sample were detected for the model variables with two exceptions. Families included in the analytic sample were significantly higher in mean SES (see Table 1) and were less likely to have mothers with a history of a mood disorder (72% in the analytic sample) than those in the original sample, suggesting that the results might be an underestimation of effects compared with those that would have been found if the participants had completed all of the assessments.

## Measures

**Maternal depression.** During the summer before children's sixth grade year, mothers' histories of depression were assessed with the SCID (Spitzer et al., 1990), a widely-used, semi-structured diagnostic interview that assesses current and previous episodes of psychopathology according to DSM criteria (American Psychiatric Association, 1987, 1994). All interviews were audio taped. Inter-rater reliability was calculated on a random subset of 20% of these interviews. Agreement was 94% ( $\kappa$  = .88) for diagnoses of depressive disorders. The final analytic sample of 145 consisted of 104 mothers with histories of depression and 41 mothers with no history of psychiatric disorders.

**Adolescent depression.** The Children's Depression Rating Scale-Revised (CDRS-R; Poznanski, Mokros, Grossman, & Freeman, 1985) is a clinical interview that generates a continuous measure of depressive symptoms (e.g., depressed mood, appetite problems) exhibited by children over the previous two weeks. The clinician rating is based on information obtained from both the mother and child during separate interviews. The CDRS-R scores obtained in sixth grade were included here. Internal consistency of the CDRS-R in this sample was .72.

TABLE 1  
Descriptive Information and Correlations among Demographic Characteristics and Model Variables (*n* = 145)

Variables	1	2	3	4	5	6	7	8	9	10
1. Socioeconomic status	—									
2. Maternal depression <sup>a</sup>	.36***	—								
3. Adolescent depression (6th grade)	.07	.16	—							
4. Adolescent gender <sup>a</sup>	-.03	.12	-.02	—						
5. FRI—adolescent (7th grade)	.06	-.13	-.13	.06	—					
6. FRI—mother (7th grade)	.17*	-.30***	-.11	.02	.40***	—				
7. Self-worth (8th grade)	.03	-.16	-.09	.03	.36***	.17*	—			
8. Attributional style (8th grade)	.06	-.14	-.13	.02	.47***	.23***	.56***	—		
9. Activities—mean (9th–12th grade)	.23**	-.33***	.07	.06	.18*	.07	.22**	.32***	—	
10. Activities—breadth (9th–12th grade)	.28**	-.22**	.07	.18*	.11	.07	.16	.25**	.73***	—
Mean	43.50	.72 <sup>b</sup>	15.36	.58 <sup>b</sup>	18.43	18.49	3.34	.46	2.90	2.71
SD	13.05	NA	3.35	NA	4.85	5.54	.60	.30	2.37	1.64
Range	6–66	NA	11–27	NA	5–26	3–26	1.4–4	-.67–.96	0–9.75	0–7

Note. FRI, family relationship index; maternal depression: 0 = no depression history; 1 = depression history; gender: 0 = male; 1 = female.

<sup>a</sup>Spearman's rank-order correlations. <sup>b</sup>Percentage (dichotomous variable).

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

**Socioeconomic status.** SES was measured using the four factor index of social status (Hollingshead, 1975). When calculating the household SES, adjustments were made for marital status and related factors (e.g., receipt of child-support from an absent spouse), as outlined in Hollingshead (1975). The SES score calculated at the sixth grade assessment was used in the present analyses; SES did not change significantly across the years of the study.

**Family relationship quality.** The Family Relationship Index (FRI: Holahan & Moos, 1983) was used to assess both adolescents' and mothers' perceptions of the overall quality of family relationships in seventh and eighth grade; the seventh grade measure was used in the "final" fitted model, whereas the eighth grade measure was tested in the alternative bi-directional model, as explained below. The FRI is a composite of three subscales from the Family Environment Scale (Moos & Moos, 1986): cohesion (e.g., "There is a lot of togetherness in our family"), expressiveness (e.g., "We say anything we want to around home"), and conflict (e.g., "We fight a lot in our family"). Higher scores on the FRI indicate better family functioning (i.e., higher cohesion and expressiveness and lower conflict). Mothers' and adolescents' FRI scores were significantly correlated at both time points ( $r = .41$  in seventh grade;  $r = .48$  in eighth grade). The FRI correlates with other measures of family functioning (Hoge, Andrews, Faulkner, & Robinson, 1989). Coefficient  $\alpha$  in this sample ranged from .82 to .86.

**Adolescent cognitions.** The Self Perception Profile for Children (Harter, 1985) assesses children's global perception of self-worth and perceived competence in five domains (i.e., academic, social, appearance, athletic, behavior). The global self-worth scale, administered in seventh and eighth grade, was used in the present study; the eighth grade measure was used in the "final" fitted model and the seventh grade measure was tested in the alternative bi-directional model. For each item, participants were asked to decide which of two statements more accurately described them and then to indicate whether the chosen statement was "really true" or "sort of true" for them. Responses are scored on a 4-point scale with lower scores reflecting poorer self-worth. Coefficient  $\alpha$  for the global self-worth scale for this sample ranged from .82 to .84.

The Children's Attributional Style Questionnaire-Revised (CASQ-R: Seligman et al., 1984; Thompson, Kaslow, Weiss, & Nolen-Hoeksema, 1998) is a self-report measure, containing 12 positive and 12 negative items. Each item varies one causal dimension (locus, stability, globality) while holding the other two dimensions constant. A mean "positive

composite" score was created by dividing the number of external, unstable, and specific responses to "good" events (e.g., "You go to a friend's party and you have fun") by the total number of positive events. A mean "negative composite" score was created by dividing the number of internal, stable, and global responses to all "bad" events (e.g., "You fail a test") by the total number of negative events.<sup>1</sup> The total score was derived by subtracting the negative from the positive composite scores, as is typical when using the CASQ-R (Gladstone & Kaslow, 1995). Lower total scores reflect a more depressive or negative attributional style. The CASQ-R administered in both the seventh and eighth grades was used in the present study. As with the self-report measures, the eighth grade CASQ-R was used in the "final" fitted model, whereas the seventh grade CASQ-R was used in the alternative model. Coefficient  $\alpha$  for the difference score ranged from .65 to .76, consistent with earlier studies (Gladstone & Kaslow, 1995; Robins & Hinkley, 1989).

**Activity involvements.** Developed for the current study, the adolescent activity involvement inventory (AII) assesses adolescents' involvement in school and community-based activities during high school.<sup>2</sup> The AII was administered separately to mothers and adolescents at the end of 12th grade. Respondents indicated in which activities the adolescent had participated during each grade (i.e., 9th, 10th, 11th, 12th). Adolescents received a score of one (participation) or zero (no participation) with regard to each listed activity (e.g., sports at school, sports in community, drama, religious activities, community service, etc.) for each high school year. For the sake of parsimony, mothers' and adolescents' responses were combined such that if either informant checked an activity, it was counted as participation. This method of combining parent and child information is consistent with the approach used in developmental psychopathology research (e.g., Achenbach, McConaughy, & Howell, 1987; Hart, Lahey, Loeber, & Hanson, 1994). Mothers' and adolescents' reports of adolescents' activity involvement were significantly correlated ( $r = .59, p < .001$ ).

Two indices of activity involvement were calculated. First, the mean number of activities in which adolescents participated each school year was used as an overall index of activity involvement during high school. This index (range 0–9.75) was calculated by dividing the total number of

---

<sup>1</sup> The CASQ-R given to the latter two-thirds of the sample included an additional 12 negative items. For these participants, mean negative composite scores were created by dividing the total number of internal, stable, and global responses by the total number of negative items (i.e., 24).

<sup>2</sup> The AII is available from the first author upon request.

activities in which adolescents were involved during ninth through 12th grade by the number of years that they were enrolled in school during that time (i.e., 1–4 years). The second index focused on breadth or dispersion of activity involvement. Similar to other measures of extracurricular participation (e.g., Eccles & Barber, 1999), activities listed on the AAI were grouped into seven activity categories including sports (e.g., both individual and team), performance/fine arts (e.g., dance), pro-social (e.g., volunteer organizations), academic clubs (e.g., debate), school involvement (e.g., pep club), press (e.g., yearbook), and leadership (e.g., student government). Adolescents received a score of one (participation) or zero (no participation) with regard to their involvement in each category across high school. Adolescents who participated in at least one activity within each category at any point during high school received a score of one for that category. The total “breadth” index was then calculated by summing the number of activity categories in which adolescents were involved during ninth through 12th grade (range 0–7).

## RESULTS

### Descriptive Patterns of Activity Involvement

Means, standard deviations, and correlations for those measures used in the “final” fitted model for the analytic sample are presented in Table 1. The majority of adolescents in this study participated in some form of organized activities during high school ( $M = 2.9$ ,  $SD = 2.4$ ). Only 14 adolescents (9.6%) did not participate in any activity during high school, all of whom were in the high risk group (i.e., had mothers who had been depressed). As shown in Table 2, high-risk boys had the lowest rates and least breadth of activity involvement.

### The Proposed Structural Model

To test the proposed model presented in Figure 1, two saturated models were examined initially in which all paths indicated in the structural diagram were estimated.<sup>3</sup> Using mean level of activities of involvement as the outcome, controlling for SES and prior adolescent depression, the saturated model provided a good fit to the data. Adolescent gender was not included as a covariate in the model because it was not associated with

---

<sup>3</sup> All structural equation models were fit using the AMOS software (Arbuckle & Wothke, 1999).

TABLE 2  
Means and Standard Deviations of Activity Involvement in Grades 9–12 by Maternal Depression History and Adolescent Gender

	<i>Number of Activities Per Year M (SD)</i>	<i>Number of Categories of Activity Involvement M (SD)</i>
Maternal depression history		
Girls ( <i>n</i> = 64)	2.54 (2.04)	2.75 (1.70)
Boys ( <i>n</i> = 40)	2.13 (2.12)	2.10 (1.60)
No maternal depression history		
Girls ( <i>n</i> = 20)	4.25 (2.30)	3.65 (1.04)
Boys ( <i>n</i> = 21)	4.15 (2.90)	2.86 (1.59)

mean level of activity involvement. The overall goodness-of-fit was nonsignificant ( $\chi^2[9, N = 145] = 11.51, ns; \chi^2/df$  ratio = 1.28). The RMSEA was .03, indicating a good fit to the data. The probability of a close fit was within the recommended range ( $p[\text{close}] = .70$ ). This saturated model, including the path coefficients and significance levels, is presented in Figure 2.

The saturated model predicting breadth of activities also provided a good fit to the data. In this model, we again controlled for SES and prior adolescent depression, and in addition adolescent gender, which was associated with breadth of activity involvement. The overall goodness-of-fit was nonsignificant ( $\chi^2[11, N = 145] = 12.62, ns; \chi^2/df$  ratio = 1.14). The RMSEA indicated a good fit to the data (RMSEA = .02). The probability of a close fit was within the recommended range ( $p[\text{close}] = .80$ ).

### An Alternative Structural Model

To address the directionality of the relations among family relationship quality, adolescent cognitions, and organized activities, an alternative model was tested. In this model, the direction of the relation between adolescent cognitions and family relationship quality was reversed such that adolescents' cognitions in seventh grade predicted family relationship quality in eighth grade. Thus, this model examined whether the relation between seventh grade adolescent cognitions and high school activities was mediated by eighth grade family relationship quality. This saturated model provided a poor fit to the data ( $\chi^2[9, N = 145] = 21.1, p < .05; \chi^2/df$  ratio = 2.3). The RMSEA was .07, and the probability of a

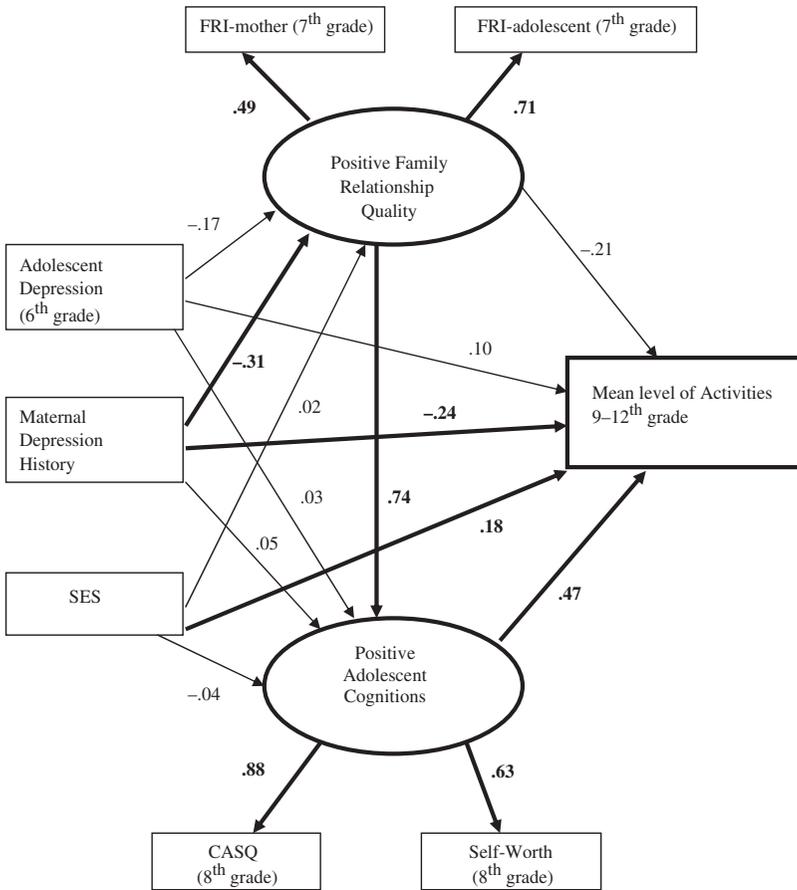


FIGURE 2 Saturated structural equation model predicting adolescents' mean level of activity involvement during high school by seventh grade family relationship quality and eighth grade adolescent cognitions, controlling for family socioeconomic status (SES) and prior adolescent depression. Factor loadings and path coefficients are standardized. Significant paths, factor loadings, and coefficients are indicated in bold type. Circles represent latent variables; rectangles represent observed variables.

close fit was not within the recommended range ( $p[\text{close}] = .19$ ). Given the poor fit of this alternative model, all subsequent analyses were performed using the original saturated model, where eighth grade adolescent cognitions mediated the relation between seventh grade family relationship quality and mean level of activity involvement across high school (Figure 2).

## Evaluating Mediated Relations

The hypothesized model (Figure 1) contains several proposed mediational pathways. Both family relationship quality and adolescent cognitions were each hypothesized to mediate the relation between maternal depression history and adolescent activities. Family relationship quality also was hypothesized to mediate the relation between maternal depression history and adolescent cognitions. Finally, adolescent cognitions were hypothesized to mediate the relation between family relationship quality and adolescent activities. Given the high correlation between the measures of level and breadth of activity involvement and for the sake of parsimony, all subsequent analyses on specific mediational pathways were conducted using the model predicting mean levels of involvement in activities as the primary outcome.

To conclude that any given model contains mediated relations, four conditions must be met (Baron & Kenny, 1986; Holmbeck, 1997). First, the predictor variable should be significantly related to the outcome variable. Next, the predictor variable must be correlated with the proposed mediator. Third, the mediator must be significantly associated with the outcome variable, controlling for the predictor variable. Finally, a significant attenuation of the effect of the predictor on the outcome should occur when the hypothesized mediator is in the model.

As compared with the mediated effect, the term "indirect effect" is reserved for relations in which only Baron and Kenny's (1986) second and third criteria are met (Kenny, Kashy, & Bolger, 1998). A significant effect of the initial predictor variable on the outcome variable is present only when the mediator is included in the model. Despite consensus in the field about how to define indirect effects, we recognize that the correct interpretation of such effects remains controversial. We used an approach similar to Tolan, Gorman-Smith, and Henry (2003) in which only mediated relations (not indirect effects) imply causality between variables.

To assess mediation in the full model, each of the four proposed mediated relations was evaluated separately according to Baron and Kenny's (1986) criteria. In order to assess the relations between the initial predictor variables and outcome variables (i.e., the first mediation criterion), we fit reduced models in which the proposed mediators were left out of causal paths. Estimates of the significance of the indirect relations were evaluated using the Goodman (I) test<sup>4</sup> (MacKinnon & Dwyer, 1993). By using statistically based methods such as the Goodman (I) test to evaluate

---

<sup>4</sup> Goodman (I) test of mediated relation  $z$  - value =  $a \times b / \text{SQRT}(b^2 \times s_a^2 + a^2 \times s_b^2 + s_a^2 \times s_b^2)$ .

indirect effects, it is possible to determine whether the drop in the total effect is significant upon inclusion of the mediator in the model (Holmbeck, 2002).

For two of the proposed mediated relations (i.e., Maternal Depression → Family Relationship Quality → Activities; Maternal Depression → Adolescent Cognitions → Activities), the first mediation criterion, that maternal depression should directly predict activities, was met ( $\beta = -.24$ ,  $p < .01$ ). Regarding the second mediation criterion, maternal depression directly predicted family relationship quality ( $\beta = -.31$ ,  $p < .01$ ), but not adolescent cognitions ( $\beta = .05$ ). The third mediation criterion was met for one of the two proposed mediated relations. A significant direct effect of adolescent cognitions on activities ( $\beta = .47$ ,  $p < .01$ ) was found, whereas the direct effect of family relationship quality on activities was not significant ( $\beta = -.21$ ). Collectively, this pattern of findings suggests that neither the criteria for mediation nor indirect effects was met for either of these two proposed mediated relations.

For the third proposed mediated relation (i.e., Maternal Depression → Family Relationship Quality → Adolescent Cognitions), the first mediation criterion, that maternal depression should directly predict adolescent cognitions, was not met ( $\beta = .05$ ). However, the second and third mediation criteria were met, as maternal depression directly predicted family relationship quality ( $\beta = -.31$ ,  $p < .01$ ), and family relationship quality directly predicted adolescent cognitions ( $\beta = .74$ ,  $p < .001$ ). The Goodman (I) test for this indirect effect was significant ( $z = -2.3$ ,  $p < .05$ ), suggesting that the effect of maternal depression on adolescent cognitions was significant when family relationship quality was included in the model. Using the revised criteria of Kenny et al. (1998), we can conclude that maternal depression indirectly predicted adolescent cognitions through family relationship quality.

For the fourth proposed mediated relation (i.e., Family Relationship Quality → Adolescent Cognitions → Activities), a direct effect between family relationship quality and activities was not significant ( $\beta = -.21$ ). However, family relationship quality significantly predicted adolescent cognitions ( $\beta = .74$ ,  $p < .001$ ), and a direct effect between adolescent cognitions and activities was found ( $\beta = .47$ ,  $p < .01$ ). The Goodman (I) test for this indirect effect was significant ( $z = 2.1$ ,  $p < .01$ ), suggesting that the effect of family relationship quality on activities was only significant once adolescent cognitions were added to the model. Collectively, these findings suggest that family relationship quality indirectly predicted activities through adolescent cognitions.

One final indirect pathway of interest incorporating the third and fourth proposed mediation relation was tested (i.e., Maternal Depres-

sion → Family Relationship Quality → Adolescent Cognitions → Activities). To examine the indirect effects that involve more than three variables, Kline (1998) cites a reasonable substitute for an exact significance test proposed by Cohen and Cohen (1983): if all of the component path coefficients are significant, then the whole indirect effect can be taken as significant. In the saturated model, all three path coefficients of Maternal Depression → Family Relationship Quality → Adolescent Cognitions → Activities met this requirement (see Figure 2); thus this indirect pathway can be considered significant.

## DISCUSSION

The findings from this study are consistent with the proposed, prospective mediational model of adolescents' organized activity involvement during high school. This model included several direct and indirect pathways of influence that allow for the examination of the relative contributions of maternal depression history, family relationship quality, and adolescent cognitions on activity involvement. First, controlling for family SES and adolescents' prior depressive symptoms, maternal depression history directly predicted activity involvement during high school, and this relation was mediated by family relationship quality measured when adolescents were in seventh grade. Second, family relationship quality indirectly affected activity involvement through adolescent cognitions assessed in eighth grade. Finally, the indirect pathway involving all four variables (i.e., Maternal Depression → Family Relationship Quality → Adolescent Cognitions → Activities) was supported.

These findings contribute to an understanding of selection factors for activity involvement in several specific ways. First, maternal depression can affect adolescent activity participation. Offspring of mothers with a history of depression (i.e., high risk) participated in significantly fewer activities per year than did offspring of nondepressed mothers (i.e., low risk). On average, high risk adolescents were involved in approximately two fewer activities per year during high school than were low risk teens. In fact, the 14 adolescents not involved in any activities during high school all were in the high risk group. Moreover, those adolescents who were missing measures were more likely to be offspring of depressed mothers. Thus, it is possible that the effect of maternal depression history on activity involvement would have been even more pronounced had these other high-risk families remained in the study.

Second, the relation between maternal depression and adolescent activity involvement was partially explained by family relationship quality

and adolescent cognitions. Although neither seventh grade family relationship quality nor eighth grade adolescent cognitions alone mediated the relation between maternal depression and activities, controlling for SES and prior adolescent depressive symptoms, significant indirect effects were found. That is, family relationship quality indirectly affected the relation between maternal depression and adolescents' cognitions, and adolescents' cognitions indirectly affected the association between family relationship quality and activity involvement. Family relationship quality was poorer in families with mothers with a depression history. In turn, poorer family relationship quality assessed in seventh grade predicted lower levels of self-worth and a more negative attributional style in eighth grade. These negative cognitions then predicted less involvement in structured organized activities during high school.

Third, the results are partially consistent with the expectancy-value model of Eccles et al. (1983) that highlights the role of parenting practices and family socio-emotional environment in activity choice and involvement. Adolescents' ratings of family relationship quality were significantly correlated with mean levels of activity involvement. In the structural model, however, the direct effect of family relationship quality on activities was not significant; rather, family relationship quality predicted adolescent cognitions, and there was a direct effect of adolescent cognitions on activities. Thus, family relationship quality indirectly predicted activities through adolescent cognitions. This finding is in contrast to prior studies that reported direct associations among family relationships, parenting, and activities (e.g., Fletcher & Shaw, 2000; Mahoney et al., 2002), although these studies did not examine whether the relation between family factors and youths' organized activity involvement was mediated by such individual factors as negative cognitions. The results from the present study highlight the contribution of both individual and contextual factors in predicting adolescents' involvement in a broad range of organized activities. It remains to be seen whether these same factors are predictive of involvement in specific types of activities (i.e., religious activities).

Fourth, a predictive relation between adolescent cognitions and activity involvement has been suggested (i.e., Seligman, 1995), although not yet tested empirically. The present study showed that adolescents who reported higher self-worth and more positive attributions about life events tended to become more involved in organized activities during high school, perhaps because they expect to obtain positive rewards from the experience. Anticipated gains from organized activity participation may include greater contact with peers, admiration from parents and teachers, awards and honors, and building credentials for college. Thus, attributional style and self-worth may capture not only optimism and feelings of

competence, respectively, but also motivational qualities important for initiating involvement in activities.

Finally, consistent with prior work on selection factors (e.g., Bartko & Eccles, 2003), family SES correlated with indices of activities during high school, such that lower SES was associated with less activity involvement. In addition, almost all adolescents in the sample participated in some form of structured, organized activities during the high school years, and mean level of activity participation per year did not differ by gender. However, girls participated in a greater breadth of activities than boys across high school. Gender differences in dispersion of activities as opposed to overall levels of involvement were reported in a recent study of activity involvement during middle childhood by Jacobs et al. (2005), who also found that girls and boys were equally involved in activities, but boys' activity participation was significantly more homogenous than girls.

This study examined the interplay between individual and familial factors in predicting adolescents' involvement in broad range of organized activities. The results suggest several important directions for future studies of selection factors of activity involvement during high school. Understanding why offspring of depressed mothers are less involved in activities could inform interventions aimed at increasing the involvement of similar high-risk teens. Given that one feature of depression is the tendency to withdraw and disengage, depressed mothers may be less involved in community activities themselves and therefore serve as poor models of involvement. In addition, depressed mothers have been found to have difficulty nurturing and supporting their children's interests (Goodman & Gotlib, 1999; Webster-Stratton & Hammond, 1988), and they may be less apt to reinforce their adolescents' involvement or provide the instrumental support necessary to maintain such involvement. Ironically, although offspring of depressed mothers appear to be less likely to participate in organized activities, they may be especially likely to benefit from such involvement. Beardslee and Podorefsky (1988) found that high-risk offspring who engaged in activities outside the home functioned better and were more resilient in response to their parents' depression than were the high-risk offspring who were less involved. Such activity involvement likely takes them away from the problems at home and allows them to develop a sense of autonomy and self-worth. Further, being exposed to coaches and adult leaders who can provide positive support and potentially model positive cognitions may be particularly important for youth with depressed parents (Eccles, Barber, Stone, & Hunt, 2003). Future studies should examine whether activity involvement moderates the effect of maternal depression on adolescents' well-being.

Another important question for future studies is how adolescents' adjustment before high school affects their activity involvement. In the current study, adolescent depressive symptoms in sixth grade did not predict subsequent activity involvement. Although depressive symptoms show considerable stability (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998), the length of the time lag between the assessment of adolescent depression and activities in the present study may explain in part why the relation was not significant. Participation in activities has been associated with lower levels of depressed mood (Mahoney et al., 2002), although the direction of this relation needs to be explored further.

Limitations of the current investigation also provide further directions for future research. First, the measure of activity involvement was obtained when adolescents were in their senior year of high school. Recall of involvement in the earlier years of high school may be influenced by adolescents' more recent levels of participation and may provide a less accurate report of activity involvement than a prospective measure. Future studies should assess activity involvement annually. In addition, measures should assess also how much time adolescents spend in each activity and the relative importance of each activity to the adolescent, as these may be salient indices of the influence of the activity in the adolescent's daily life. Despite these limitations, however, the activity inventory used in this study allowed for a comprehensive assessment of participation by examining both school and community-based activities and by obtaining reports from both adolescents and their mothers.

Additionally, activity involvement before high school may be related to high school participation but was not assessed in this study. Some students become involved in organized activities earlier in childhood through such experiences as local soccer teams or music lessons. Such early involvement may facilitate the development of initiative and solidify the cognitions that are associated with involvement during high school. Family-level characteristics also may influence activity involvement at younger ages, when parents play a greater role in managing their children's daily lives (Cairns & Cairns, 1994). Studies that assess these constructs earlier in development can address such questions about the growth and directionality of relations among these variables.

Another limitation as well as strength of this study was that individual and family-level variables were assessed in sixth, seventh, and eighth grades, before the start of high school. By so doing, we were able to examine the contribution of these variables before adolescents initiated high school activity involvement. It is possible, however, that measures of family relationship quality and adolescent cognitions throughout the course of high school may have shown even stronger associations with

activity involvement than these measures obtained during middle school. Additionally, though this study focused on mothers' depression history and possible mechanisms (i.e., family relationship quality and adolescent cognitions) through which maternal depression history may influence adolescents' activity involvement, it did not address how mothers' *current* level of depression affected adolescents' activity involvement. Given that depression is highly recurrent (e.g., Solomon et al., 2000), it is likely that many of the mothers with histories of depression had additional later episodes whose effects on their offsprings' activity involvement should be explored. In addition, future work examining the impact of maternal depression on adolescents' activity involvement should examine the contribution of comorbid psychopathology in mothers as well. Fathers' histories of mood disorders and other forms of psychopathology as well as couples' marital relationships also may be important predictors of youths' activity involvement and should be explored in future studies.

Organized structured activities represent a unique developmental context in which youth can develop important life skills (Larson, 2000). The current study focused on family and individual characteristics in a sample of adolescents who differed with regard to their mother's history of depression. The extent to which these results generalize to a purely community sample with more ethnic and socioeconomic diversity needs to be explored. Further study of predictors of adolescent activity involvement is needed to inform the efforts of community and school leaders in their work to overcome barriers such as accessibility and cost of participation for lower SES families. Understanding what factors influence activity involvement may allow parents, teachers, coaches, community leaders, mental health professionals, and others to support and promote adolescents' involvement in organized activities more effectively in order that they might experience the positive benefits that can result.

### ACKNOWLEDGMENTS

This work was supported in part by grants to Judy Garber (R29-MH45458; R01-MH57822; K02 MH66249) from the National Institute of Mental Health, and a Faculty Scholar Award (88-1214) and grant (961730) from the William T. Grant Foundation. Amy M. Bohnert and Nina C. Martin were supported in part from an NIMH training grant (T32-MH18921). We would like to thank Grayson Holmbeck and Fred Bryant for their comments on an earlier version of this manuscript. We appreciate the cooperation of the Nashville Metropolitan School District, Drs. Binkley and Crouch, and we thank the parents and children who participated in the project.

## REFERENCES

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*, 213–232.
- Arbuckle, J. L., & Wothke, W. (1999). *Amos user's guide: Version 4.0*. Chicago: Small Waters Corporation.
- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: APA.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: APA.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.
- Bartko, W. T., & Eccles, J. S. (2003). Adolescent participation in structured and unstructured activities: A person-oriented analysis. *Journal of Youth and Adolescence*, *32*, 233–241.
- Beardslee, W. R., Keller, M. B., Lavori, P. W., Klerman, G. K., Dorer, D. J., & Samuelson, H. (1988). Psychiatric disorder in adolescent offspring of parents with affective disorders in a nonreferred sample. *Journal of Affective Disorders*, *15*, 313–322.
- Beardslee, W. R., & Podorefsky, D. (1988). Resilient adolescents whose parents have serious affective and other psychiatric disorders: The importance of self-understanding and relationships. *American Journal of Psychiatry*, *145*, 63–69.
- Beardslee, W. R., Versage, E. M., & Gladstone, T. R. (1998). Children of affectively ill parents: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, *37*, 1134–1141.
- Cairns, R. B., & Cairns, B. D. (1994). *Lifelines and risks: Pathways of youth in our time*. New York: Cambridge University Press.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cole, D. A., Peeke, L. G., Martin, J. M., Truglio, R., & Seroczynski, A. D. (1998). A longitudinal look at the relation between depression and anxiety in children and adolescents. *Journal of Consulting and Clinical Psychology*, *66*, 451–460.
- Coleman, J. S. (1961). *The adolescent society*. New York: Free Press.
- Conger, R. D., Patterson, G. R., & Ge, X. (1995). It takes two to replicate: A mediational model for the impact of parent's stress on adolescent adjustment. *Child Development*, *66*, 80–97.
- Cooper, H., Valentine, J. C., Nye, B., & Lindsay, J. J. (1999). Relationships between five after-school activities and academic achievement. *Journal of Educational Psychology*, *91*, 369–378.
- Cutler, G. J. (1999). *Activity involvement in adolescence and competence past, present, & future*. Albuquerque, New Mexico: Paper presented at the Society for Research in Child Development.
- Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., & Meece, J. L., et al. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). San Francisco: W.H. Freeman.
- Eccles, J. S., & Barber, B. (1999). Student council, volunteering, basketball, or marching band: What kind of organized involvement matters? *Journal of Adolescent Research*, *14*, 10–43.
- Eccles, J. S., Barber, B. L., Stone, M. R., & Hunt, J. (2003). Extracurricular activities and adolescent development. *Journal of Social Issues*, *59*, 865–889.

- Elder, C., Leaver-Dunn, D., Wang, M. Q., Nagy, S., & Green, L. (2000). Organized group activity as a protective factor against adolescent substance use. *American Journal of Health Behavior, 24*, 108–113.
- Fletcher, A. C., Elder, G. H., & Mekos, D. (2000). Parental influences on adolescent involvement in community activities. *Journal of Research on Adolescence, 10*, 29–48.
- Fletcher, A. C., & Shaw, R. A. (2000). Sex differences in association between parental behaviors and characteristics and adolescent social integration. *Social Development, 9*, 133–148.
- Garber, J., & Flynn, C. (2001). Predictors of depressive cognitions in young adolescents. *Cognitive Therapy and Research, 25*, 353–376.
- Garber, J., & Martin, N. C. (2002). Negative cognitions in offspring of depressed parents: Mechanisms of risk. In S. H. Goodman & I. H. Gotlib (Eds.), *Children of depressed parents: Mechanisms of risk and implications for treatment* (pp. 121–154). Washington, DC: American Psychological Association Books.
- Garber, J., & Robinson, N. S. (1997). Cognitive vulnerability in children at risk for depression. *Cognition and Emotion, 11*, 619–635.
- Gladstone, T. G., & Kaslow, N. J. (1995). Depression and attributions in children and adolescents: A meta-analytic review. *Journal of Abnormal Child Psychology, 23*, 597–607.
- Goodman, S. H., Adamson, L. B., Riniti, J., & Cole, S. (1994). Mothers' expressed attitudes: Associations with maternal depression and children's self-esteem and psychopathology. *Journal of the American Academy of Child and Adolescent Psychiatry, 33*, 1265–1274.
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review, 106*, 458–490.
- Hammen, C. L. (1991). *Depression runs in families: The social context of risk and resilience in children of depressed mothers*. New York: Springer-Verlag.
- Harnish, J. D., Dodge, K. A., Valente, E., & Conduct Problems Prevention Research Group (1995). Mother-child interaction quality as a partial mediator of the roles of maternal depressive symptomatology and socioeconomic status in the development of child behavior problems. *Child Development, 66*, 739–753.
- Hart, E. L., Lahey, B. B., Loeber, R., & Hanson, K. S. (1994). Criterion validity of informants in the diagnosis of disruptive behavior disorders in children: A preliminary study. *Journal of Consulting and Clinical Psychology, 62*, 410–414.
- Harter, S. (1985). *Self-perception profile for children: Revision of the perceived competence scale for children*. Denver, CO: University of Denver.
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York: Guilford Press.
- Hirsch, B. J., Moos, R. H., & Reischl, T. M. (1985). Psychosocial adjustment of adolescent children of a depressed, arthritic, or normal parent. *Journal of Abnormal Psychology, 94*, 154–164.
- Hoge, R. D., Andrews, D. A., Faulkner, P., & Robinson, D. (1989). The Family Relationship Index: Validity data. *Journal of Clinical Psychology, 45*, 897–903.
- Holahan, C. J., & Moos, R. H. (1983). The quality of social support: Measures of family and work relationships. *British Journal of Clinical Psychology, 22*, 157–162.
- Hollingshead, A. B. (1975). *Four factor index of social status*. Working paper. New Haven, CT: Department of Sociology, Yale University.
- Holmbeck, G. N. (1997). Toward terminological, conceptual and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology, 65*, 599–610.
- Holmbeck, G. N. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology, 27*, 87–96.

- Jacobs, J. E., & Eccles, J. S. (2000). Parents, task values, and real life achievement choices. In C. Sansone & J. Harackiewicz (Eds.), *Intrinsic motivation* (pp. 408–433). San Diego, CA: Academic.
- Jacobs, J. E., Vernon, M. K., & Eccles, J. S. (2005). Activity choices in middle childhood: The roles of gender, self-beliefs, and parents' influence. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 235–254). Mahwah, NJ: Erlbaum Associates Press.
- Jaenicke, C., Hammen, C., Zupan, B., Hiroto, D., Gordon, D., & Adrian, C., et al. (1987). Cognitive vulnerability in children at risk for depression. *Journal of Abnormal Child Psychology*, *15*, 559–572.
- Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, pp. 233–265). New York: Oxford University Press.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: Guilford.
- Larson, R. W. (2000). Toward a psychology of positive youth development. *American Psychologist*, *55*, 170–183.
- MacKinnon, D. P., & Dwyer, J. H. (1993). Estimating mediated effects in prevention studies. *Evaluation Review*, *17*, 144–158.
- Mahoney, J. L. (2000). School organized activity participation as a moderator in the development of antisocial patterns. *Child Development*, *71*, 502–516.
- Mahoney, J. L., & Cairns, R. B. (1997). Do organized activities protect against early school dropout? *Developmental Psychology*, *33*, 241–253.
- Mahoney, J. L., Cairns, R. B., & Farmer, T. W. (2003). Promoting interpersonal competence and educational success through extracurricular activity participation. *Journal of Educational Psychology*, *95*, 409–418.
- Mahoney, J. L., Schweder, A. E., & Stattin, H. (2002). Structured after-school activities as a moderator of depressed mood for adolescents with detached relations to their parents. *Journal of Community Psychology*, *30*, 69–86.
- McHale, S. M., Crouter, A. C., & Tucker, C. J. (2001). Free-time activities in middle childhood: Links with adjustment in early adolescence. *Child Development*, *72*, 1764–1778.
- McNeal, R. (1998). High school organized activities: Closed structures and stratifying patterns of participation. *The Journal of Educational Research*, *91*, 183–191.
- Moos, R. H., & Moos, B. S. (1986). *Family environment scale manual* (rev. ed) Palto Alto, CA: Consulting Psychological Press.
- Patterson, G. R., & Bank, L. (Eds.). (1989). *Some amplifying mechanisms for pathologic process in families* (Vol. 22). Hillsdale, NJ: Erlbaum.
- Patterson, G. R., & Dishion, T. J. (Eds.). (1988). *Multilevel family process models: Traits, interactions, and relationships*. Oxford, UK: Clarendon Press.
- Poznanski, E., Mokros, H. B., Grossman, J., & Freeman, L. N. (1985). Diagnostic criteria in childhood depression. *American Journal of Psychiatry*, *142*, 1168–1173.
- Radke-Yarrow, M. (1998). *Children of depressed mothers*. Cambridge, UK: Cambridge University Press.
- Robins, C. J., & Hinkley, K. (1989). Social-cognitive processing and depressive symptoms in children: A comparison of measures. *Journal of Abnormal Child Psychology*, *17*, 29–36.
- Seligman, M. E. (1995). *The optimistic child*. New York: Harper Perennial.
- Seligman, M. E., Peterson, C., Kaslow, N. J., Tanenbaum, R. L., Alloy, L. B., & Abramson, L. Y. (1984). Explanatory style and depressive symptoms among children. *Journal of Abnormal Psychology*, *93*, 235–238.

- Solomon, D. A., Keller, M. B., Leon, A. C., Mueller, T. I., Lavori, P. W., & Shea, M. T., et al. (2000). Multiple recurrences of major depressive disorder. *American Journal of Psychiatry, 157*, 229–233.
- Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. B. (1990). *User's guide for the structured clinical interview for DSM-III-R*. Washington, DC: American Psychiatric Press.
- Thompson, M., Kaslow, N. J., Weiss, B., & Nolen-Hoeksema, S. (1998). Children's Attributional Style Questionnaire-Revised: Psychometric examination. *Psychological Assessment, 10*, 166–170.
- Tolan, P.H, Gorman-Smith, D., & Henry, D. (2003). The developmental ecology of urban males' youth violence. *Developmental Psychology, 39*, 274–291.
- Webster-Stratton, C., & Hammond, M. (1988). Maternal depression and its relationship to life stress, perceptions of child behavior problems, parenting behaviors and child conduct problems. *Journal of Abnormal Child Psychology, 16*, 299–315.
- Zahn-Waxler, C., Iannotti, R. J., Cummings, E. M., & Denham, S. (1990). Antecedents of problem behaviors in children of depressed mothers. *Development and Psychopathology, 2*, 271–291.

