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The Effects of Family, School, and Classroom Ecologies on Changes in Children's Social Competence and Emotional and Behavioral Problems in First Grade

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This study tested the independent and interactive influences of classroom (concentrations of peer prosocial behaviors and victimization), family (household moves, mothers' education), and school (proportion of students receiving income assistance) ecologies on changes in children's social competence (e.g., interpersonal skills, leadership abilities), emotional problems (e.g., anxious, withdrawn behaviors), and behavioral problems (e.g., disruptiveness, aggressiveness) in first grade. Higher classroom concentrations of prosocial behaviors and victimization predicted increases in social competence, and greater school disadvantage predicted decreases. Multiple household moves and greater school disadvantage predicted increases in behavioral problems. Multiple household moves and low levels of mothers' education predicted increases in emotional problems for children in classrooms with few prosocial behaviors. Greater school disadvantage predicted increases in emotional problems for children in classrooms with low prosocial behaviors and high victimization. Policy implications of these findings are considered.

Interest in applying ecological models to the investigation of how multiple environmental systems uniquely and interactively influence children's development over time has been mounting in recent years (Aber, Gephart, Brooks-Gunn, Connell, & Spencer, 1997; Bronfenbrenner, 1977; Bronfenbrenner & Ceci, 1994). Several studies have documented that school-age children's development is affected by characteristics of their family, school, and classroom environments, including family disruptiveness, poverty, social climate, and levels of aggressiveness (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Attar, Guerra, & Tolan, 1994; Brody, Dorsey, Forehand, & Armistead, 2002; Kellam, Ling, Merisca, Brown, & Ialongo, 1998). However, few studies have examined the effect of the interplay among multiple social ecologies on changes in children's social, emotional, and behavioral development over the course of first grade. This fact is particularly noteworthy given calls to reorient policy and programming toward enhancing the contexts that support children's development (see Maton, Schellenbach, Leadbeater, & Solarz, 2004).

The purpose of the current study was to examine the unique and interacting contributions of classroom-, family-, and school-level variables to changes in children's social competence (e.g., interpersonal skills, leadership abilities, self-regulation), emotional problems (e.g., anxiety, fearfulness, shyness, sadness), and behavioral problems (e.g., physical aggressiveness, hyperactivity, disruptiveness, destructiveness) during first grade. Family-level characteristics included the number of household moves and mothers' education levels. The school-level indicator reflected the proportion of students receiving income assistance. The classroom-level indicators included concentrations of peer prosocial behaviors and victimization.

Consistent with an ecological model of children's development (Bronfenbrenner, 1977), our conceptual framework proposes that classroom ecologies have particular salience for school-age children and that these interact with family- and school-level factors in socializing their in-school behaviors. Classroom compositions determine the peers to which children are exposed and with whom they interact most directly and continuously (Hartup, 1996; Perry & Weinstein, 1998; Rubin, Bukowski, & Parker, 1998). The collective competencies and problems in these classroom groupings likely contribute to the overall quality of peer interactions, which in turn affect children's development during first grade (Crick & Ladd, 1993; Kellam et al., 1998; Ladd, 1990).

Family ecology plays prominent roles in socializing children prior to school entry and influences the schools children attend and aspects of their relationships with classmates, including the stability of their friendships and support for contact outside of school (Ackerman et al., 1999; Criss, Pettit, Bates, Dodge, & Lapp, 2002; Gauze, Bukowski, Aquan-Assee, & Sippola, 1996; Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995; Yoshikawa, 1994). Aspects of school ecology, such as school disadvantage, can further contribute to children's socialization patterns and in-school behaviors. In more disadvantaged schools, students' aggregate behaviors may be less competent, thus yielding fewer peers to

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model competent behaviors (Attar et al., 1994; Battistich, Solomon, Kim, Watson, & Schaps, 1995; Perry & Weinstein, 1998).

In the following sections we review research in support of the proposed model, specifically examining how classroom-, family-, and school-level features may independently and synergistically contribute to changes in children's in-school behaviors over the course of first grade.

Classroom-Level Influences on Children's In-School Behaviors

Although children's classroom ecologies can be characterized according to multiple perspectives and social and structural features (Perry & Weinstein, 1998), we consider the social atmosphere among classmates, as rated by the children themselves, to be particularly salient for children's social, emotional, and behavioral development in first grade. Growing evidence indicates that aggregate levels of peer behaviors within classroom groupings, including aggressive or victimizing behaviors, contribute to children's adjustment in school, even after family- and school-level factors are accounted for (Aber, Jones, Brown, Chaudry, & Samples, 1998; Kellam et al., 1998). For instance, in an evaluation of a first-grade classroom intervention directed at reducing children's aggressive behaviors, Kellam et al. (1998) found that placement in first-grade classrooms with higher aggregate levels of physically aggressive peers (as rated by teachers) contributed to boys' (but not girls') behavioral problems in middle school, independent of family economic disadvantage and school disadvantage. Illustrating the connection between individual and peer group behavior, O'Connell, Pepler, and Craig (1999) showed that peers reinforce episodes of school-based peer victimization by watching or by physically or verbally joining the aggressors. Evidence also indicates that children's experiences of peer victimization in schools and classrooms are reciprocally linked to their social, emotional, and behavioral problems, such that children who show these problems are more likely to be victimized, which, in turn, can further elevate their level of problems (Hodges, Boivin, Vitaro, & Bukowski, 1999; Schwartz, McFadyen-Ketchum, Dodge, Pettit, & Bates, 1999). Clearly, aggressive and victimizing peer behaviors are not limited to dyads but rather function at the group level, and being in a classroom surrounded by a hostile group of peers who manipulate or harm other children may contribute to individual risks for developmental problems (Bukowski & Sippola, 2001).

On the other hand, concentrated exposure to positive peer affiliations can reduce risks for social, emotional, or behavioral problems. Evidence shows that being competent in the social, emotional, or behavioral domain or having friends who can provide support and protection reduces children's risk of being victimized and increases their likelihood of receiving prosocial acts from peers (Crick & Grotpeter, 1996; Hodges et al., 1999; Schwartz et al., 1999; Vitaro, Brendgen, Pagani, Tremblay, & McDuff, 1999). Vitaro et al. (1999) highlighted the importance of positive peer affiliations in their follow-up study of aggressive, second-grade boys who were targeted for an intervention program to improve social and problem-solving skills. Boys who associated with nondeviant peers showed lower risks for conduct disorder 4 years later than did program boys who associated with deviant peers. Having a stable group of well-adjusted, prosocial peers in the classroom increases children's exposure to more positive social learning experiences, which may, in turn, enhance their developmental outcomes (Bandura, 1977; Brody et al., 2002; Vitaro et al., 1999). Although some research has shown that positive peer relationships and classroom environments can attenuate the negative effects of family- or school-level adversities on children's development (Battistich et al., 1995; Brody et al., 2002; Criss et al., 2002), few studies have examined the ways that both positive and negative features of children's classrooms (particularly aggregate experiences of peer prosocial acts and victimization) shape children's behaviors in school in concert with markers of their family and school ecologies.

Family-Level Influences on Children's In-School Behaviors

Although family ecology is multidimensional and can affect children's development through many avenues (McLoyd, 1998; Yoshikawa, 1994), we focus specifically on indicators of family disruptiveness (household moves) and socioeconomic status (SES; mothers' education level) that can directly affect children's experiences in school. Evidence also suggests that these indicators may be linked (Ackerman et al., 1999). Research has documented that family disruptions, such as multiple household moves, contribute to social, emotional, and behavioral problems in children (Ackerman et al., 1999; Adam & Chase-Lansdale, 2002; DeWit, Offord, & Braun, 1998; Humke & Shaefer, 1995; Kohen, Hertzman, & Wiens, 1998). Ackerman et al. (1999) observed that children who experienced high levels of family disruptions, including multiple household moves, in their early years were at higher risk for behavioral problems in preschool and for emotional problems in first grade than were children who experienced few disruptions. Although household moves may index changes in family SES (e.g., employment, income status), structure (e.g., divorce), or even opportunities, accumulating evidence indicates that the transitions necessitated by household moves represent an independent source of stress for children (Adam & Chase-Lansdale, 2002; Kohen et al., 1998). Yet evidence on the mechanisms by which household moves affect school-age children's development is limited.

Shifts in household residences introduce disruptions into children's lives that can compromise the maintenance and accessibility of their social networks, particularly when parents' social and institutional ties are displaced. When children in a classroom have few bonds to one another outside the classroom or school environment because of residential instability, the supportive nature of the classroom climate may be threatened. On the other hand, the relation between household moves and children's behaviors may be attenuated in the presence of more constructive environmental experiences, such as classroom climates characterized by positive or supportive peer interactions (Brody et al., 2002).

Parental education has been positively linked to social competence and negatively related to emotional and behavioral problems in young children (DeWit et al., 1998; Duncan, Brooks-Gunn, & Klebanov, 1994; Pagani, Boulerice, & Tremblay, 1997) and may mediate the effects of household income on children's competent behaviors (Hanson, McLanahan, & Thomson, 1997). Parental education indexes the human capital available to scaffold children's socialization and is less prone than household income to short-term financial fluctuations that can mask its effects, including seasonal unemployment or welfare spells (Entwisle & Astone, 1994; McLoyd, 1998). On the other hand, evidence suggests that poorly educated parents are more socially isolated, are less connected to

the school system, and generate fewer social learning opportunities for their children outside of the school environment (Dodge, Pettit, & Bates, 1994; Kupersmidt et al., 1995; McLoyd, 1998; Werner, 1993). If parents show limited engagement in their children's social experiences (e.g., rarely invite children's classmates over to play), their children may have few opportunities to develop interpersonal skills and may lack protective friendships with peers (Dodge et al., 1994; Kupersmidt et al., 1995).

Evidence also indicates that low parental education can increase children's exposure to environmental stressors, including family and neighborhood poverty, family disruptions, and other adverse social conditions (Attar et al., 1994; Dodge et al., 1994). When low parental education is coupled with other environmental stressors, such as high aggregate levels of poverty in schools and peer aggressiveness in classrooms, children's risks for developmental problems may be amplified (Kellam et al., 1998). However, few studies have examined how mothers' education level and household moves influence children's in-school behaviors in the context of school- and classroom-related stressors.

School-Level Influences on Children's In-School Behaviors

Characteristics of children's school ecology are also varied and can operate on children's development through many avenues (Perry & Weinstein, 1998). We focus specifically on how school disadvantage (the proportion of poor students in the school) effects changes in children's in-school behaviors. Exposure to high aggregate levels of poverty (at the neighborhood and school levels) has been shown to adversely affect children's development (Attar et al., 1994; Battistich et al., 1995; Duncan et al., 1994; Kellam et al., 1998; Sandler, Ayers, Suter, Schultz, & Twohey, 2004). For instance, Kellam et al. (1998) found that high levels of school disadvantage (the proportion of children eligible for free lunch) in first grade increased children's risk for behavioral problems in middle school, independent of family economic disadvantage and classroom levels of physical aggressiveness. Schools that concentrate children who are vulnerable to social, emotional, or behavioral problems together may reduce their exposure to competent peers and positive peer interactions (Attar et al., 1994; Cook, Herman, Phillips, & Settersten, 2002; Duncan et al., 1994). For instance, Simons, Johnson, Beaman, Conger, and Whitbeck (1996) showed that residing in poorer communities (which is, in turn, reflected in the economic characteristics of neighborhood-based schools) heightened adolescents' likelihood of associating with deviant peers, which, in turn, increased their risk for conduct problems. There is also evidence to suggest that episodes of peer victimization in classrooms are more common in disadvantaged schools than in more advantaged schools (Hanish & Guerra, 2000).

Associations between school disadvantage and poor developmental outcomes may also be altered by positive attributes of other salient environments, such as the prosocial or helping environment of children's classrooms. In the context of classrooms with high concentrations of prosocial, competent peer interactions, the negative influence of school disadvantage on children's development may be weakened (Battistich et al., 1995; Sandler et al., 2004). Yet surprisingly, few studies have explored how first-grade children's social, emotional, and behavioral trajectories are affected by the intersection of school disadvantage and the social environment of children's classrooms in the context of family-level risks.

The Current Study

In sum, the current study examined the independent and interactive contributions of classroom (concentrations of peer prosocial behaviors and victimization), family (household moves, mothers' education), and school (proportion of students receiving income assistance) factors to changes in children's in-school behaviors, as rated by their teachers during first grade. We expected (a) that increases in social competence across first grade would be predicted by higher levels of mothers' education and classroom prosocial behaviors, fewer household moves, and lower levels of school disadvantage and classroom victimization; (b) that increases in emotional and behavioral problems would be predicted by lower levels of mothers' education and classroom prosocial behaviors, multiple household moves, and higher levels of school disadvantage and classroom victimization; and (c) that the classroom-level variables would moderate the effects of the family- and school-level factors on changes in children's in-school behaviors. Specifically, the classroom concentration of prosocial behaviors was expected to buffer the effects of multiple household moves, low levels of mothers' education, and school disadvantage on changes in children's behaviors. The classroom concentration of victimization was expected to augment the effects of multiple household moves, low levels of mothers' education, and school disadvantage.

Method

Participants

Participants included 432 first-grade children (49% girls; mean age = 6 years 3 months) in 44 classrooms and 17 schools at the beginning of first grade (Time 1). At the end of first grade (Time 2), there were 423 children (98% of the original sample). Attrition was due to children moving out of the school district. The children are participants in a 3-year, ongoing, longitudinal study of the onset and development of linkages among peer victimization, social competence, and emotional and behavioral problems and in an evaluation of the W.I.T.S. (Walk away, Ignore, Talk it out, Seek help) Rock Solid Primary Program, a peer victimization prevention program[1] in a medium-sized Canadian city (Leadbeater, Hoglund, & Woods, 2003). The overall consent rate was 64% across all participating schools (range = 47% to 91%) and did not significantly differ between disadvantaged and advantaged schools. Parental consent was not obtained for children whose parents did not speak enough English to give informed consent and for special needs children who could not be interviewed, even on an individual basis (e.g., autistic children).

Parent reports indicated that 65% of the children lived with both parents. Nine percent of mothers did not graduate from high school, 47% completed some training beyond high school, and 28% received a bachelor's or graduate degree. Thirty-one percent of the children had no lifetime household moves, and 28% had three or more lifetime household moves. Children's ethnicity or race was as follows: 73% were Canadian and European

[1] The effects of the W.I.T.S. program are being evaluated to the end of these children's third-grade school year. The program and control children are combined for the current analyses. The effects of the program on changes in children's social competence and behavioral problems were not significant at this point. However, the main effect of the program on changes in emotional problems was significant (when entered as a control variable in the three models tested, βs ranged from $-.12$ to $-.14$ at the final step) but did not contribute to the overall variance in the regression models (the R^2 contributed by program status was .008). Program effects appeared by the end of the children's second-grade school year and are reported in Leadbeater, Hoglund, and Woods (2003).

Caucasian, 9% were South East Asian and East Asian, 7% were Aboriginal, 4% were East Indian, 5% were Other (e.g., African, Hispanic, or Caribbean), and 2% reported no ethnicity or race. Seventy-three percent of parents reported that English was the only language spoken at home, and 11% reported that another language was spoken at home more than half the time or all the time (e.g., French or Chinese).

Procedure

Data were collected in the fall of 2000 (Time 1) and in the spring of 2001 (Time 2). Parents who gave consent for their child's participation completed questionnaires assessing family demographics and children's social competence and emotional and behavioral problems. Parent reports of children's behaviors were not used in these analyses because classroom-level effects on children's behaviors at school were the focus of this study. Parents (86% mothers) completed the forms and returned these to their children's teachers in sealed envelopes. For each child in their classroom who had parental consent, teachers completed questionnaires rating the child's social competence and emotional and behavioral problems; teachers made these ratings when the children's questionnaires were being administered. Children completed one questionnaire that assessed both peer prosocial behaviors and victimization and a second questionnaire on interpersonal negotiation strategies (not used in the current study). Data were collected from groups of 9 to 20 children during class time. (This reflected the number of children in the class who had consent and were present on the testing day. Children who had consent and were absent on the data collection day were interviewed individually when they returned to school.) An evaluator read the questionnaires aloud to the children, and research assistants circulated in the classroom to ensure that all children were able to understand the questionnaires and fill them out correctly. Children who needed extra assistance were interviewed individually,[2] including children for whom English was not the primary language spoken at home. Children without parental consent were supervised by research assistants in a different room and participated in drawing, writing, and reading activities.

Measures

Children's in-school behaviors. Children's social competence, emotional problems, and behavioral problems were assessed from teacher reports of children's behaviors on the Early School Behavior Rating Scale (ESBS; Caldwell & Pianta, 1991) at Times 1 and 2. The teacher version of the ESBS contains 40 items rated on a four-point Likert-type scale (1 = *hardly ever* to 4 = *almost always*). This scale taps children's *social competence* (e.g., interpersonal skills, awareness of others' emotional states, leadership abilities; 14 items), *emotional problems* (e.g., anxiety, shyness, social withdrawal, fearfulness, sadness, depressive symptoms; 17 items), and *behavioral problems* (e.g., physical aggression, disruptiveness, attention problems; 9 items). Internal reliabilities of the teacher reports were adequate (αs = .90 for social competence, .84 for emotional problems, and .88 for behavioral problems). Teachers' Time 1 and Time 2 reports of children's behaviors were highly correlated (rs = .69 to .80), indicating high stability over the school year.

Classroom-level indicators. Children's self-reports of peer prosocial behaviors and relational and physical victimization were assessed with the Social Experiences Questionnaire (SEQ; Crick & Grotpeter, 1996) at Time 2. This questionnaire has demonstrated validity with both kindergarten and elementary school children (Crick, Casas, & Ku, 1999; Crick & Grotpeter, 1996). The SEQ contains three subscales with five items each that assess children's receipt of peer *prosocial behaviors* (e.g., helping, sharing, caring behaviors), *relational victimization* (e.g., social exclusion and manipulation, threats to end friendships, rumor spreading), and *physical victimization* (e.g., hitting, pushing, shoving). Children rated on a 3-point Likert-type scale (adapted from the original 5-point scale) how often the events occurred (0 = *never*, 1 = *sometimes*, 2 = *almost all the time*). Internal reliabilities were adequate for each of the subscales (αs = .73 for prosocial behaviors, .72 for relational victimization, and .76 for physical victimization).

Classroom concentrations of peer prosocial behaviors and victimization were computed individually for each child by summing prosocial and victimization scores, respectively, for all the other children in the classroom (i.e., excluding scores for that child) and dividing by n minus 1. This created a classroom-level variable for each child that reflected the classroom environment the child was exposed to and prevented the child's own score from unduly influencing the measure. As others have established (Aber et al., 1998; Brody et al., 2002), children are reliable informants about their classroom environments and may provide more accurate representations of unfavorable classroom attributes than may teachers (Rutter, 2000).

Family-level indicators. Parents' reports of the number of lifetime *household moves* the child had experienced by school entry (M = 1.87, SD = 2.19, range = 0–13) and *mothers' education levels* (M = "some college or technical training beyond high school," reflecting a 3 on a scale ranging from 0 = *eighth grade or less* to 6 = *a graduate degree*) were measured at Time 1.

School-level indicators. Estimates of *school disadvantage* were measured at Time 1 from school district records of the "proportion of students receiving income assistance" in the school (a composite of schools' neighborhood-level SES indicators, including levels of education, number of single-parent households, household income, and receipt of social assistance; Hoyle, 1998). The total range of school disadvantage in the participating schools was 3% to 24% (M = 11.88%, SD = 5.66%), which was representative of the range in the school district. Of the participating schools, 50% were above the district average of 10% of students receiving income assistance.

Results

Intercorrelations Among the Dependent and Independent Variables

Zero-order correlations among the variables are shown in Table 1. As expected, children's social competence, emotional problems, and behavioral problems showed high levels of stability from the beginning to the end of first grade (correlations shown in bold). Higher levels of social competence were associated with lower levels of emotional and behavioral problems. Levels of emotional problems were positively related to levels of behavioral problems.

Multiple household moves were associated with lower levels of social competence and higher levels of emotional and behavioral problems at Times 1 and 2. Mothers' education level was negatively correlated with children's emotional problems at Times 1 and 2 and with behavioral problems at Time 2. School disadvantage was positively associated with children's emotional and behavioral problems at Times 1 and 2. Classroom concentration of prosocial behaviors was positively related to children's social competence at Time 2. Classroom concentrations of relational and physical victimization were positively correlated with children's behavioral problems at Time 2. None of the classroom-level predictors were correlated with children's behaviors at school entry. In addition, girls showed higher levels of social competence at

[2] At Time 1, 31 children were reported by their parents as having a mild form of learning difficulty. Entered in the first step of each of the nine models we tested, learning difficulty did not make any substantial contributions as a main effect or to the explained variance and was eliminated from the analyses. Letter grades rating academic performance are not given before fourth grade in this school district.

Table 1
Zero-Order Correlations Between Children's Behaviors at the Beginning and End of First Grade and Markers of Family, School, and Classroom Ecologies

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Outcome variables												
1. Social competence (T2)	—											
2. Emotional problems (T2)	−.47**	—										
3. Behavioral problems (T2)	−.70**	.36**	—									
Predictor variables												
4. Social competence (T1)	**.71****	−.36**	−.54**	—								
5. Emotional problems (T1)	−.36**	**.69****	.21**	−.50**	—							
6. Behavioral problems (T1)	−.61**	.29**	**.80****	−.69**	.30**	—						
7. Family household moves (T1)	−.24**	.22**	.31**	−.25**	.16**	.26**	—					
8. Mothers' education (T1)	.11	−.17**	−.13**	.12	−.15**	−.08	−.15**	—				
9. School disadvantage (T1)	−.08	.23**	.21**	−.03	.20**	.14**	.19**	−.45**	—			
10. Classroom prosocial behaviors (T2)	.14**	−.02	.04	.07	.00	.04	.05	−.02	.09	—		
11. Classroom relational victimization (T2)	.05	.05	.13**	−.04	.03	.11	.16**	−.22**	.43**	.26**	—	
12. Classroom physical victimization (T2)	.00	.09	.16**	−.09	.10	.10	.17**	−.23**	.43**	.14**	.77**	—
13. Gender (girls = 1; boys = 0)	.20**	.02	−.25**	.11	.01	−.22**	−.05	−.01	.03	−.00	.02	−.01

Note. $N = 393$. T1 = Time 1; T2 = Time 2. Correlations in boldface type show stability of children's social competence, emotional problems, and behavioral problems over time.
** $p < .01$ with Bonferroni and listwise deletion adjustments.

Time 2 and lower levels of behavioral problems at Times 1 and 2 compared with boys. Intercorrelations among the family-, school-, and classroom-level indicators were moderate, except for correlations with classroom levels of prosocial behaviors, which were not significant.

Multiple Regression Analyses of Changes in Children's In-School Behaviors

Separate multiple hierarchical regression models were used to examine the independent and interacting effects of the predictor variables on changes in children's social competence and emotional and behavioral problems across first grade. In each equation, gender was entered first.[3] Time 1 levels of the dependent variables were entered in the second step to account for school-entry levels of these behaviors. Household moves and mothers' education were entered in the third step, and school disadvantage was entered fourth. Classroom concentrations of prosocial behaviors and victimization were entered in the fifth step to assess their contribution to changes in children's behaviors beyond the family and school variables. (Classroom concentrations of relational and physical victimization were summed to create one measure of classroom victimization because of their high intercorrelation and model instability when entered separately.)

Because of limitations in power, the hypothesized interactions were entered, separately, as the final step in three sets of regression models. The first set (Model 1) tested the effects of interactions between household moves and (a) classroom prosocial behaviors and (b) classroom victimization. The second set (Model 2) examined the interactions between mothers' education and (a) classroom prosocial behaviors and (b) classroom victimization. The third set (Model 3) assessed the effects of interactions between school disadvantage and (a) classroom prosocial behaviors and (b) classroom victimization. Thus, three regression models were tested for each developmental domain, for a total of nine regression models examined overall.

As recommended by Aiken and West (1991), the predictor and moderator variables were centered (i.e., standardized so their means were equal to zero), and interaction terms were created by multiplying the centered variables together. Significant interaction terms were probed by examining the relation between the predictor variable and the outcome variable at the mean and at one standard deviation below and above the mean of the moderator.

The effects of family-, school-, and classroom-level indicators on social competence. As shown in Table 2, the three regression models each accounted for 56% of the total variance in changes in social competence and were significant, Fs(11, 381) = 44.53 to 44.61, ps $< .01$. In each model, gender, behavioral problems at school entry, school disadvantage, and classroom concentrations of prosocial behaviors and victimization contributed to changes in children's social competence after initial levels of social competence were accounted for. Girls showed greater increases in social competence compared with boys, as did children in classrooms with higher concentrations of prosocial behaviors. Contrary to expectations, increases in social competence were also related to higher classroom concentrations of victimization. Higher levels of behavioral problems at school entry and greater school disadvantage predicted decreases in social competence. None of the interaction sets contributed significantly to changes in social competence.

The effects of family-, school-, and classroom-level indicators on emotional problems. As shown in Table 3, regression Models 1 and 3 explained 51% of the total variance in changes in emotional problems and were significant, Fs(11, 381) = 36.10 and 36.86 (respectively), ps $< .01$. Regression Model 2 explained 50% of the total variance in changes in emotional problems and was

[3] Interactions between gender and each of the family-, school-, and classroom-level predictors on changes in the three dependent variables were examined. Only 1 of the 15 gender interactions was significant, less than what would have been expected by chance.

Table 2
Hierarchical Regression Analyses Predicting Changes in Children's Social Competence From the Beginning to the End of First Grade

Step variables	Model 1		Model 2		Model 3		
	β	F	β	F	β	F	Models 1–3 ΔR^2
1. Gender (girls = 1; boys = 0)	.10**	15.81**	.09**	15.81**	.09**	15.81**	.04
2. Social competence (T1)	.53**		.54**		.53**		
Emotional problems (T1)	−.02		−.02		−.02		
Behavioral problems (T1)	−.20**	137.75**	−.20**	137.75**	−.20**	137.75**	.50
3. Family household moves (T1)	−.06		−.05		−.06		
Mothers' education (T1)	.00	0.95	.01	0.95	.01	0.95	.00
4. School disadvantage (T1)	−.09*	0.61	−.09*	0.61	−.09*	0.61	.00
5. Classroom prosocial behaviors (T2)	.09*		.09*		.08*		
Classroom victimization (T2)	.12**	10.17**	.10*	10.17**	.11*	10.17**	.02
6a. Household Moves × Classroom Prosocial	−.04						
Household Moves × Classroom Victimization	.02	0.69					.00
6b. Mothers' Education × Classroom Prosocial			.01				
Mothers' Education × Classroom Victimization			−.07	1.75			.00
6c. School Disadvantage × Classroom Prosocial					−.02		
School Disadvantage × Classroom Victimization					.05	0.88	.00
Model (R^2 = .56, df = 11, 381 for each model)		44.53**		44.97**		44.61**	

Note. β values are standardized coefficients at the final step. Step 1 df = 1, 391; Step 2 df = 3, 388; Step 3 df = 2, 386; Step 4 df = 1, 385; Step 5 df = 2, 383; Step 6 df = 2, 381. T1 = Time 1; T2 = Time 2.
* $p < .05$. ** $p < .01$.

significant, $F(11, 381) = 36.82$, $p < .01$. In each model, higher levels of behavioral problems at school entry and multiple household moves contributed to increases in children's emotional problems after initial levels of emotional problems were accounted for.

The interaction between household moves and classroom concentration of prosocial behaviors was significant (see Table 3, Model 1). This interaction was probed by comparing the slopes of the regression lines at low, average, and high levels of classroom prosocial behaviors. As can be seen in Figure 1, children who experienced a high number of moves (4 or more) showed significant increases in emotional problems when they were in classrooms with low or average levels of prosocial behaviors, compared with children who experienced a low number of household moves. For children in classrooms with high levels of prosocial behaviors,

Table 3
Hierarchical Regression Analyses Predicting Changes in Children's Emotional Problems From the Beginning to the End of First Grade

Step variables	Model 1		Model 2		Model 3		
	β	F	β	F	β	F	Models 1–3 ΔR^2
1. Gender (girls = 1; boys = 0)	.05	0.19	.03	0.19	.03	0.19	.00
2. Social competence (T1)	.07		.07		.05		
Emotional problems (T1)	.65**		.65**		.65**		
Behavioral problems (T1)	.12*	121.68**	.11*	121.68**	.11*	121.68**	.49
3. Family household moves (T1)	.09*		.10**		.09*		
Mothers' education (T1)	−.03	4.93**	−.03	4.93**	−.03	4.93**	.01
4. School disadvantage (T1)	.07	2.00	.08	2.00	.09*	2.00	.00
5. Classroom prosocial behaviors (T2)	−.05		−.04		−.08*		
Classroom victimization (T2)	−.03	0.94	−.03	0.94	−.03	0.94	.00
6a. Household Moves × Classroom Prosocial	−.08*						
Household Moves × Classroom Victimization	.06	2.93*					.01
6b. Mothers' Education × Classroom Prosocial			.07*				
Mothers' Education × Classroom Victimization			−.04	2.16			.00
6c. School Disadvantage × Classroom Prosocial					−.09*		
School Disadvantage × Classroom Victimization					.09*	4.99**	.01
Models 1 and 3 (R^2 = .51, df = 11, 381); Model 2 (R^2 = .50, df = 11, 381)		36.10**		36.82**		36.86**	

Note. β values are standardized coefficients at the final step. Step 1 df = 1, 391; Step 2 df = 3, 388; Step 3 df = 2, 386; Step 4 df = 1, 385; Step 5 df = 2, 383; Step 6 df = 2, 381. T1 = Time 1; T2 = Time 2.
* $p < .05$. ** $p < .01$.

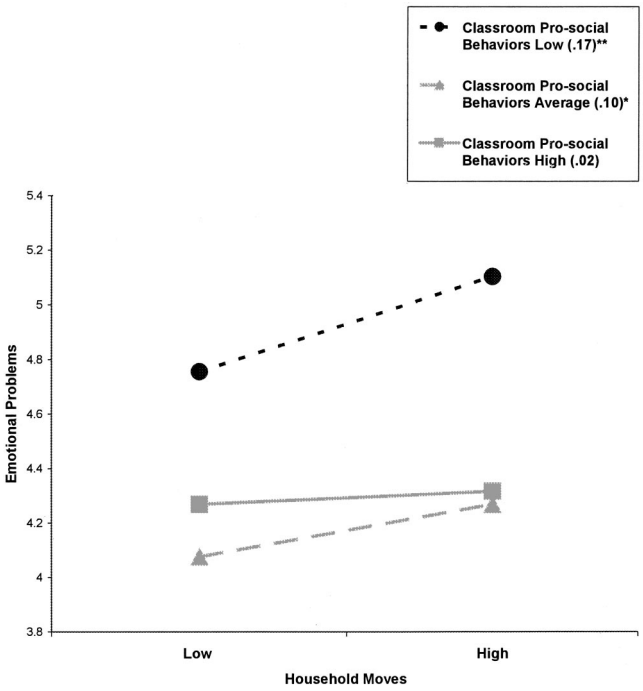

Figure 1. The relation between household moves and emotional problems as a function of classroom concentration of prosocial behaviors. Numbers in parentheses are beta values for slopes. Slope was significantly different from zero for low, $t(382) = 3.01$, $p < .01$, and average, $t(382) = 2.49$, $p < .05$, levels of classroom prosocial behaviors. *$p < .05$. **$p < .01$.

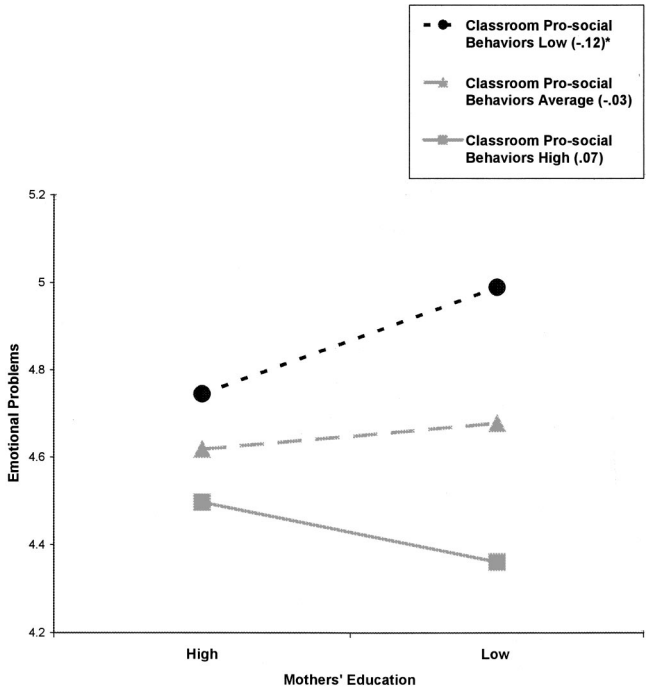

Figure 2. The relation between mothers' education and emotional problems as a function of classroom concentration of prosocial behaviors. Numbers in parentheses are beta values for slopes. Slope was significantly different from zero for low classroom prosocial behaviors, $t(382) = -1.95$, $p < .05$. *$p < .05$.

changes in emotional problems did not differ between children with low or high numbers of moves.

The interaction between mothers' education level and classroom concentration of prosocial behaviors effected significant changes in emotional problems (see Table 3, Model 2). This interaction was probed by comparing the slopes of the regression lines at low, average, and high levels of classroom prosocial behaviors. As shown in Figure 2, children whose mothers had low education levels (high school diploma or less) showed significant increases in emotional problems when they were in classrooms with low levels of prosocial behaviors, compared with children whose mothers had high education levels (bachelor's degree or more). For children in classrooms with average or high concentrations of prosocial behaviors, changes in emotional problems remained stable between low and high levels of mothers' education.

Greater school disadvantage and a lower classroom concentration of prosocial behaviors contributed independently to increases in emotional problems only in the context of the interactions between school disadvantage and the classroom-level indicators (see Table 3, Model 2). The interactions between school disadvantage and classroom concentrations of prosocial behaviors and victimization were also significant. These interactions were probed by comparing the slopes of the regression lines at low, average, and high levels of the classroom variables. As can be seen in Figure 3, children in schools with high levels of disadvantage (17.5% or higher) showed significant increases in emotional problems when they were in classrooms with low levels of prosocial behaviors, compared with children in schools with low levels of

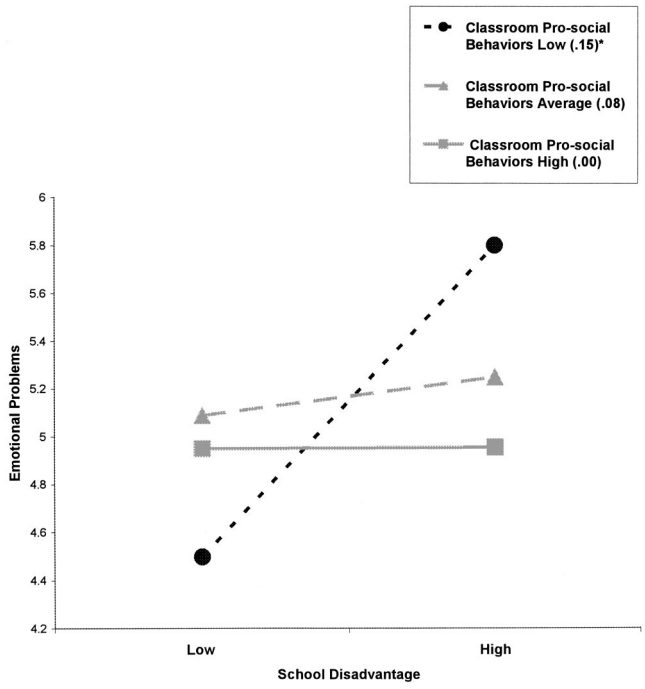

Figure 3. The relation between school disadvantage and emotional problems as a function of classroom concentration of prosocial behaviors. Numbers in parentheses are beta values for slopes. Slope was significantly different from zero for low classroom prosocial behaviors, $t(382) = 2.19$, $p < .05$. *$p < .05$.

disadvantage (6.2% or lower). For children in classrooms with average or high concentrations of prosocial behaviors, changes in emotional problems did not differ between low and high levels of school disadvantage. As can be seen in Figure 4, children in schools with high levels of disadvantage experienced significant increases in emotional problems when they were in classrooms with high levels of victimization, compared with children in schools with low levels of disadvantage. For children in classrooms with low or average concentrations of victimization, changes in emotional problems did not differ between low and high levels of school disadvantage.

The effects of family-, school-, and classroom-level indicators on behavioral problems. As shown in Table 4, each of the three regression models accounted for 67% of the total variance in changes in behavioral problems and was significant, *F*s(11, 381) = 68.52 to 68.99, *p*s < .01. In all three models, gender, household moves, and school disadvantage contributed to changes in children's behavioral problems after initial levels of behavioral problems were accounted for. Girls showed greater decreases in behavioral problems compared with boys. Multiple household moves and greater school disadvantage predicted increases in behavioral problems. None of the interaction sets contributed significantly to changes in behavioral problems.

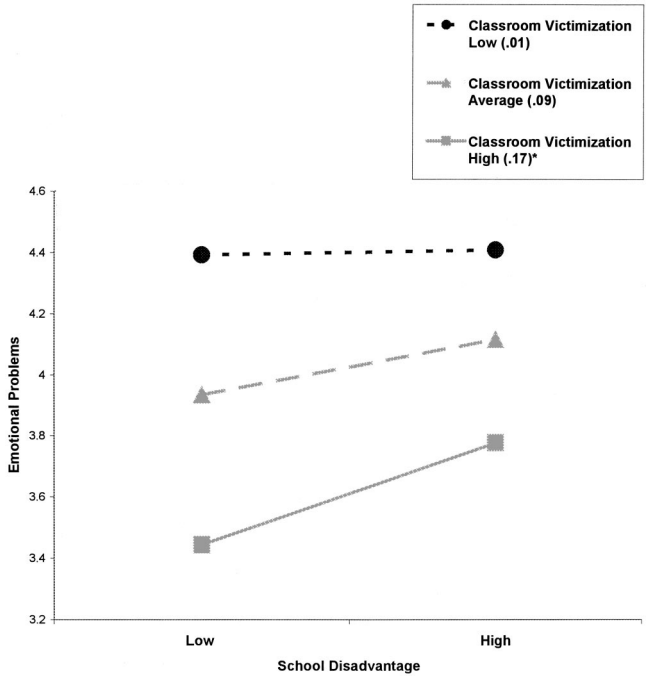

Figure 4. The relation between school disadvantage and emotional problems as a function of classroom concentration of victimization. Numbers in parentheses are beta values for slopes. Slope was significantly different from zero for high classroom victimization, $t(382) = 2.67$, $p < .01$. *$p < .01$.

Discussion

The findings provided some support for our hypotheses that family- and school-level ecological factors would have direct effects on, and would interact with classroom differences, in effecting changes in children's in-school behaviors in first grade. Modest interaction effects were seen only for emotional problems. Multiple household moves and low levels of mothers' education contributed to increases in emotional problems for children in classrooms with low concentrations of peer prosocial behaviors. Greater school disadvantage was also associated with increases in emotional problems for children in classrooms with low concentrations of peer prosocial behaviors and classrooms with high concentrations of peer victimization.

Table 4
Hierarchical Regression Analyses Predicting Changes in Children's Behavioral Problems From the Beginning to the End of First Grade

	Model 1		Model 2		Model 3		
Step variables	β	*F*	β	*F*	β	*F*	Models 1–3 ΔR^2
1. Gender (girls = 1; boys = 0)	−.09**	26.78**	−.08**	26.78**	−.09**	26.78**	.06
2. Social competence (T1)	−.02		−.02		−.02		
Emotional problems (T1)	−.06		−.06		−.06		
Behavioral problems (T1)	.75**	209.23**	.74**	209.23**	.74**	209.23**	.58
3. Family household moves (T1)	.09**		.09**		.09**		
Mothers' education (T1)	−.02	8.64**	−.02	8.64**	−.02	8.64**	.02
4. School disadvantage (T1)	.09*	6.77**	.08*	6.77**	.09*	6.77**	.01
5. Classroom prosocial behaviors (T2)	−.01		−.01		−.03		
Classroom victimization (T2)	.02	0.13	.03	0.13	.02	0.13	.00
6a. Household Moves × Classroom Pro-Social	.01						
Household Moves × Classroom Victimization	−.02	0.18					.00
6b. Mothers' Education × Classroom Pro-Social			.02				
Mothers' Education × Classroom Victimization			.04	1.04			.00
6c. School Disadvantage × Classroom Pro-Social					−.04		
School Disadvantage × Classroom Victimization					.02	0.89	.00
Model (R^2 = .67, *df* = 11, 381 for each model)		68.52**		68.99**		68.91**	

Note. β values are standardized coefficients at the final step. Step 1 *df* = 1, 391; Step 2 *df* = 3, 388; Step 3 *df* = 2, 386; Step 4 *df* = 1, 385; Step 5 *df* = 2, 383; Step 6 *df* = 2, 381. T1 = Time 1; T2 = Time 2.
* $p < .05$. ** $p < .01$.

We begin our discussion by addressing the importance of preschool development and gender on children's behaviors in first grade and go on to discuss the significance of the independent and interactive influences of classroom, family, and school ecologies on children's development. Implications of these findings for policy and programming are also considered.

Early Child Characteristics

Behaviors at school entry. In each model tested, children's behaviors at school entry were the most significant predictors of their behaviors at the end of first grade. This finding highlights the importance of nurturing children's readiness for school and enhancing their early social, emotional, and behavioral competence (Yoshikawa, 1994). Behavioral problems in particular contributed to negative changes in all three domains of children's development. Children's self-regulation skills and ability to control aggressiveness in the preschool years are particularly important for their ability to successfully navigate first grade.

Gender. Consistent with other research on gender differences (Maccoby, 1990), our findings show that gender (whether it reflects socialization practices or sex differences) plays an important role in children's early social and behavioral development. Girls showed greater increases in social competence and greater declines in behavioral problems in first grade. Although power was insufficient in the current study, research assessing differences in girls' and boys' experiences of ecological advantages and risks and how these ecological experiences affect their development is warranted (see Leadbeater, Dhami, Hoglund, & Boone, 2004).

Classroom-Level Influences on Children's In-School Behaviors

Consistent with our hypotheses, the classroom concentration of prosocial behaviors (helping, caring, sharing behaviors) predicted increases in social competence after children's school-entry behaviors, gender, and classroom level of victimization were accounted for. Our findings converge with those of other investigations in showing that helpful and supportive features of children's peers and classrooms are related to children's emerging competencies (Brody et al., 2002; Criss et al., 2002). Prosocial classroom environments may work by exposing children to competent peers who can model helping and caring behaviors (Bandura, 1977; Brody et al., 2002; Criss et al., 2002; Vitaro et al., 1999).

Contrary to our hypotheses, the classroom concentration of relational and physical victimization predicted increases in social competence during first grade. However, this relation was significant only when it was examined along with the family- and school-level predictors, which suggests that these latter factors suppressed variance associated with classroom victimization that was not relevant to the prediction of social competence (Pedhazur, 1997). Nevertheless, this unexpected relation is consistent with accumulating evidence that some young children are adept at using both prosocial and coercive behaviors to maintain social dominance and attain instrumental goals (Hawley, 2002; Pettit, Bakshi, Dodge, & Coie, 1990). It may also be that socially competent children have more opportunities to interact with peers, which increases their exposure to victimization, and are more skilled at identifying (and reporting) victimization than are their less socially competent peers (Dodge & Price, 1994). Competent children might also continue to develop social competence even in adverse classroom settings because of a threshold of initial competence that facilitates their resilience (Masten & Coatsworth, 1998).

Also contrary to expectations, the overall prosocial nature of children's classrooms was not sufficient to curb levels of aggressive, disruptive behaviors in children. Other studies have found that classroom and peer levels of physical aggressiveness do affect boys' behavioral problems in later school years (Kellam et al., 1998; Vitaro et al., 1999). But Kellam et al.'s (1998) evaluation of the classroom-based "Good Behavior Game," which rewarded cooperative behaviors, showed that the influence of classroom aggression on boys' risks for behavioral problems could be buffered by programs that directly promoted prosocial behaviors. Spontaneous acts of prosocial behaviors among children may have little effect in altering the course of behavioral problems unless such prosocial behaviors are directly targeted by teachers through classroom-based programs. It may also be that young children who have behavioral problems are less affected by classroom levels of prosocial behaviors or subtle forms of victimization because of social-cognitive difficulties in perceiving peers as unfriendly or hostile, and such children may believe that they are liked despite negative interactions with peers (Dodge & Price, 1994; Rudolph & Clark, 2001).

Consistent with our hypotheses, classroom levels of prosocial behaviors and victimization did predict modest changes in emotional problems in interaction with the family- and school-level indicators. These interactions are discussed with the findings for the family- and school-level indicators below.

Family-Level Influences on Children's In-School Behaviors

Consistent with expectations and previous research (Ackerman et al., 1999; Adam & Chase-Lansdale, 2002; DeWit et al., 1998; Kohen et al., 1998), family household moves predicted increases in children's emotional problems and (in interaction with prosocial classrooms) increases in behavioral problems after children's school-entry behaviors, gender, mothers' education, and the school- and classroom-level indicators were accounted for. As in other studies (Ackerman et al., 1999; DeWit et al., 1998), one third of the children in this study had moved households three or more times by school entry. Frequent household transitions may add to the environmental challenges already facing children from low-SES households, such as few conventional social activities, limited social supports, or neighborhood violence (Attar et al., 1994; Dodge et al., 1994; McLoyd, 1998).

Moves may also disrupt the continuity of the friendships of shy, socially withdrawn children and aggressive, disruptive children and may challenge their already limited capacity to cultivate friendships (Ackerman et al., 1999; Hartup, 1996). Children who enter school with established friendships are more likely to adjust well to the school environment (Ladd, 1990). Our findings further showed that moves were particularly damaging for shy, socially withdrawn children when they were also in classrooms with low to average levels of prosocial behaviors. Although these findings are modest, they suggest that more supportive classroom environments may offer transient children who are shy and socially withdrawn a secure place where new social networks can be established despite frequent moves (Brody et al., 2002; Criss et al., 2002). Prosocial classrooms appear to have little additional influence in limiting

behavioral problems in transient, aggressive children. These children may be rejected by prosocial classmates regardless of the supportive nature of the classroom environment. Clearly there is a need to understand why families with young children shift households numerous times and how these transitions affect the stability of children's social networks, familiar surroundings (including changes in child-care and educational settings), and exposure to other environmental stressors.

Also consistent with expectations, children whose mothers had low levels of education showed modest increases in emotional problems when they were in classrooms with low levels of peer prosocial behaviors. Parents with low education levels may be constrained in their capacity to actively or competently scaffold their children's socialization because of stressors in their own lives, such as intermittent or low-paying employment (Dodge et al., 1994; McLoyd, 1998; Werner, 1993). These parents may also have limited access to social resources, including supportive adult mentors or neighbors who could help to care for their children or generate socially stimulating environments (Dodge et al., 1994; McLoyd, 1998). Parents who themselves did poorly at school or who have low-paying jobs may also be reluctant or not available to advocate for their children or participate in school activities, such as parent–teacher nights, leaving shy, withdrawn children on their own to cope with unfriendly classroom environments.

The mechanisms through which family- and classroom-level adversities appear to jointly intensify children's shy, fearful, and socially withdrawn behaviors, but not their competent or aggressive behaviors, remain somewhat shrouded. Interestingly, it was the lack of prosocial behaviors, not the presence of victimizing behaviors, that modestly elevated levels of emotional problems in children experiencing family-level risks. The importance of positive peer behaviors converges with findings from other investigations in suggesting that programs to foster prosocial peer interactions within classroom settings are needed to attenuate the adverse effects of family-level risks on children's development (Brody et al., 2002; Criss et al., 2002; Gauze et al., 1996).

School-Level Influences on Children's In-School Behaviors

Consistent with our hypotheses and previous research (Attar et al., 1994; Kellam et al., 1998), school disadvantage predicted decreases in social competence and increases in behavioral problems in first grade. However, school disadvantage contributed to changes in social competence only when it was examined in the regressions along with the family- and classroom-level predictors. This finding suggests that the latter predictors operated as suppressor variables to reduce variance associated with school disadvantage that was not relevant to the prediction of social competence (Pedhazur, 1997). Although this suggests that this finding should be interpreted with caution, it is consistent with past observations of the incremental effects of multiple risks on children's competence (Cook et al., 2002; Sandler et al., 2004). In the context of family- and classroom-level risks, children's capacity for sustaining competence appears to be overwhelmed when they are also exposed to poor school environments.

Consistent with the findings of Kellam et al. (1998), school disadvantage independently predicted increases in behavioral problems. School disadvantage may concentrate children who model and reinforce aggressive behaviors for one another (Attar et al., 1994; Dishion, McCord, & Poulin, 1999). Teachers in these schools may also be overstressed and may have little time to deal with hard-to-manage children on an individual basis (Canadian School Boards Association, 1999). It is also possible that school disadvantage works through processes that were not measured in this study, such as the schools' social climate or disciplinary practices (Battistich et al., 1995; Kuperminc, Leadbeater, & Blatt, 2001) or a mismatch in the fit between characteristics of the school and the needs of aggressive, disruptive children (Eccles et al., 1993). School-wide programs that foster positive school and classroom climates, such as by enhancing prosocial acts while reducing peer victimization at the classroom level, may mitigate the risks of school disadvantage on children's development (Battistich et al., 1995; Leadbeater et al., 2003).

Children in schools with high levels of disadvantage experienced moderate increases in emotional problems when they were in classrooms with low levels of prosocial behaviors and classrooms with high levels of victimization. Disadvantaged schools may have few additional resources, such as individual counseling or instruction and parent volunteers or other adult mentors that shy, socially withdrawn children need to support their capacity to enter peer groups, sustain supportive friendships, or deal with hostile peers (Adelman & Taylor, 1998). Interestingly, classroom victimization effected increases in emotional problems only in interaction with school disadvantage, which suggests that hostile peer environments might only become taxing for shy, socially withdrawn children when packaged with the stress of disadvantaged school environments. Classrooms that can suppress peer hostility (victimization) while enhancing prosocial, supportive behaviors may buffer negative outcomes for shy, socially withdrawn children in these disadvantaged schools (Battistich et al., 1995; Brody et al., 2002). Further research is needed to explore how links between school- and classroom-level variables affect the social, emotional, and behavioral development of children over time in the context of family stressors.

Policy and Programming Implications

School readiness programs are clearly needed, particularly to address preschool behavioral problems. Our findings suggest that there is also a need to enhance resilience in developmental outcomes not only by focusing on the individual child but also by targeting aspects of family, school, and classroom ecologies that can influence children's vulnerability (see Leadbeater, Maton, Schellenbach, & Solarz, 2004). Such ecological changes might include working to increase prosocial peer interactions in classrooms, enhancing school stability among transient children (Christenson & Thurlow, 2004; Garbarino, Hammond, & Mercy, 2004), and promoting school-wide programs to enhance prosocial behaviors in disadvantaged schools (Battistich et al., 1995; Comer, 1985; Hundert et al., 1999; Leadbeater et al., 2003; Olweus, 1993).

Limitations

Longitudinal follow-up research with these children is needed to illuminate whether family, school, and classroom ecologies, and their interactive effects, continue to influence changes in children's development over time. Larger samples are also needed to assess the mechanisms by which household moves, mothers' education levels, school disadvantage, and classroom levels of both prosocial

and aggressive peer interactions heighten children's vulnerability. Our measures of family and school ecology were limited to demographic descriptors that captured only some forms of instability and social risk in children's lives. Research that complements these demographic indicators with more process-oriented variables, such as family, teacher, and school levels of cohesiveness, emotional climate, or hostility, could extend the findings of the current study. Data on children's perceptions of the ways that teachers and other school personnel also influence norms for classmates' behaviors would provide a more complete picture of classroom environments. Finally, although the range of school disadvantage in the current study was representative of the school district involved, findings may differ in schools or communities with higher poverty concentrations or more extreme differences (Reitsma-Street, Hopper, & Seright, 2000). In sum, this study represents a step toward understanding how family, school, and classroom characteristics effect changes in children's social competence and emotional and behavioral problems. A more holistic picture of children's social, emotional, and behavioral development can be painted by achieving progress in understanding how ecological forces collectively socialize school-age children over time.

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