

Running head: ECOLOGICAL RISK

The Moderating Role of Developmental Microsystems in Selective Preventive Intervention  
Effects on Aggression and Victimization of Aggressive and Socially-Influential Students

The Multisite Violence Prevention Project

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## Abstract

Although ecology is often cited as an important factor in prevention, it is infrequently incorporated to the evaluation of intervention effects. This study tests the moderating role of three developmental microsystems (family, peer, and school) on a family-focused intervention to prevent violence. The family intervention was part of the Multisite Violence Prevention Project, a trial involving random assignment of 37 schools to four conditions: 1) a universal intervention composed of a student social-cognitive curriculum and teacher training, 2) a selective multiple family group intervention, 3) these two interventions combined, and 4) a no-intervention control condition. The present study focused on 1113 eligible families from two cohorts. Students attending schools that were randomly assigned to the selective family intervention were compared with students in other conditions. Composite indicators of risk were formulated for each microsystem and entered as moderators of intervention effects on violence and aggression perpetration and overt and relational victimization. Results of intent-to-treat and dose-weighted analyses indicated that peer risk moderated outcomes, but family and school risk did not. Intervention effects were limited to youth with elevated peer risk at the outset of intervention. This pattern points to the importance of peer groups in the effects of family-focused interventions, particularly with high-risk early adolescent youth. More generally, the results illustrate the importance of mesosystems for understanding prevention effects. (219 words)

Key Words: Aggression, violence prevention, middle school, family interventions, peer influence.

The Moderating Role of Developmental Microsystems in Selective Preventive Intervention  
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Bronfenbrenner (1979) provided a valuable perspective for understanding risk development and preventive interventions effects (Tolan, Guerra, & Kendall, 1995), contending that variations in functioning at any point in development can be understood as the combined impact of variations in the risk and protective features of multiple environmental levels (Cicchetti & Toth, 1992). The most proximal level of influence is from ongoing interpersonal relationships and regularities promoted by primary developmental settings (Tseng & Seidman, 2007). Bronfenbrenner (1979) terms these *microsystems*. For most children the microsystems that have the most direct and ongoing influence on development are family relationships, peers, and prominent socializing settings such as school (Tolan, Szapocznik, & Sambrano, 2007). Each of these three microsystems have qualities that relate to opportunities and threats to the child's functioning at any given point in development (Elliott & Tolan, 1999; Farrell & Camou, 2006).

These microsystems do not act in isolation, however. Parents communicate with teachers, and with friends' parents. Peers attend the same school and spend time with families. Thus the microsystems are themselves linked in a system of relationships that Bronfenbrenner (1988) termed the *mesosystem*. Although the ecological perspective is often invoked to explain risk and as the focus of preventive efforts, there have been limited applications of a multiple microsystem approach in risk studies and almost no such efforts in analyzing prevention effects (Hawkins, Farrington, & Catalano, 1998; Tolan & Gorman-Smith, 2002). Interventions occur within, and often aim to change, aspects of key microsystems. Thus, it seems likely that pre-existing microsystem characteristics would affect intervention impact on individual risk (Kellam & Langevin, 2003).

Multiple intervention studies lead us to expect contextual moderation. Pre-existing school characteristics have been found to moderate intervention outcomes (Aber, Jones, Brown, Chaundry, & Samples, 1998; Conduct Problems Prevention Research Group, 2010; Farrell, Henry, & Bettencourt, in press; Greenberg, Domitrovich, Graczyk, & Zins, 2005), possibly through intervention implementation (Gregory, Henry, Schoeny, & The Metropolitan Area Child Study Research Group [MACS], 2007). Pre-existing differences in family functioning and parenting have been found to moderate family intervention effects (Tolan, Gorman-Smith, & Henry, 2004). Still other studies suggest that involvement of deviant peers may produce intervention effects that are the opposite of those that are intended (Dishion, McCord, & Poulin, 1999).

The present study evaluates the relative influence of family, peer, and school microsystem characteristics as potential moderators of the effects of a selective prevention program for sixth grade students and their families. By targeting youth on risk for aggression and influence among peers, we aimed not only to directly affect students exhibiting a substantial proportion of the aggression and violence, but also to produce indirect effects on other students they would influence. Intent-to-treat outcome analyses based on random assignment of schools to conditions provided support for this hypothesis (MVPP, 2009a). We found that in schools assigned to receive the selective intervention for these targeted students, aggression decreased within the randomly-selected general student population sample (the "cohort-wide" sample; MVPP, 2009a). Even though only approximately 4% of the general student population was exposed directly to the selective intervention, in schools where the selective intervention was offered to parents, the average aggression of the student body did not increase over time to the same extent as in other schools. This finding has led us to explore how the selective intervention

affected aggression through change in the family microsystem (Multisite Violence Prevention Project, 2012), providing one impetus for this study. The other impetus, drawn from reports of effects on the general population sample, was the moderation of impact of the universal and selective interventions on the general student population by pre-intervention risk levels (MVPP, 2008). In those analyses an individual's risk was calculated as the count of a large set of risk factors representing family, peer, and school variables. Those with higher pre-intervention risk scores showed greater benefits from each intervention than those with typical or lower levels of risk. Similar results have been found in several other randomized prevention trials (e.g., Farrell, Meyer, Sullivan, & Kung, 2003; Metropolitan Area Child Study Research Group (MACS), 2002; Stoolmiller, Eddy, & Reid, 2000). The cohort-wide and targeted samples overlapped minimally (14.5% of the cohort-wide sample), thus, it is not known whether ecological moderation of the selective intervention in the cohort-wide sample was due to the effect on the cohort-wide sample, or to its effect on the targeted sample. This study focuses on ecological moderation of the effects of the selective intervention on individual youth in the targeted sample.

## **Method**

### **Design**

The study employed a cluster-randomized design in which schools within each site were randomly assigned to four conditions: universal intervention, selective intervention, combined (universal and selective), and no-intervention control. All interventions were implemented over a single school year with two successive cohorts of sixth graders beginning in 2001.

### **Procedures**

Extensive descriptions of overall procedures are available in prior publications and reports (see Ikeda, et al., 2004; Miller-Johnson, Sullivan, Simon, & The Multisite Violence

Prevention Project, 2004; Multisite Violence Prevention Project, 2009a; Phillips-Smith, et al., 2004). The institutional review boards at the four participating universities and the Centers for Disease Control and Prevention (CDC) approved the procedures. Figure 1 is a CONSORT chart (Altman, et al., 2001) detailing participant selection, consent, and assessment for the targeted sample, which is the source of data for this report. For this study we limited the data analyzed to the intervention year because nearly half of the targeted sample did not remain in their intervention schools in the follow-up years. The absence of school measures in follow-up years for this part of the sample would have complicated the interpretation of longer-term ecological effects.

### **Settings and Participants**

The targeted sample comprised two successive age cohorts of students and their families, selected from among sixth graders in 37 schools from four communities: Chicago, Illinois; Durham, North Carolina; Northeastern Georgia; and Richmond, Virginia. Most participating schools included a high percentage of students from low-income families (42% to 96% across sites were eligible for Federal food assistance). Additional details regarding school recruitment and community characteristics are reported in Henry, Farrell, and MVPP (2004).

**Selection of the Targeted Sample.** Two sixth-grade core teachers from each school identified students whose aggressive behavior was in the top 25% of the sixth grade based on a four-item scale. Teachers then rated the identified students on their levels of social influence using another four-item scale. A cut score was used to select the 30-40% most socially influential among those identified as elevated in aggression (Miller-Johnson, Sullivan, Simon, & MVPP, 2004), resulting in up to 25 students per school being selected. Teachers were not informed which students were identified as a result of the process.

**Participation in the Study and in the Selective Intervention.** Of those eligible and contacted, 74% consented to participate. Across the two cohorts 45% of the eligible families attended at least one session, and 37% attended eight or more sessions. These participation rates are comparable to those attained in other similar family prevention trials (cf., Dishion, Kavanagh, Schneiger, Nelson, & Kaufman, 2002).

### **Measures**

We created composite measures of physical and non-physical aggression using up to three sources of information. Student reports were the sole source of information to measure overt and relational victimization. To test ecological moderation of the developmental influences, we created composite indicators of family functioning, peer risk, and school functioning.

**Physical and Non-Physical Aggression.** The student-report Aggression scale ( $\alpha = .92$ ) of the Problem Behavior Frequency Scale (PBFS; Farrell, Kung, White, & Valois, 2000), combined with parent and teacher reports on the Aggression subscale of the Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1998) formed physical (6 student, 9 teacher, 2 parent items,  $\alpha = .75$ ) and non-physical (11 student, 9 teacher, 7 parent items,  $\alpha = .84$ ) composite measures of aggression.

**Victimization.** PBFS Overt Victimization (6 items;  $\alpha = .93$ ) and Relational Victimization (6 items;  $\alpha = .85$ ) scales measured victimization ( $r = .71$  between the two). Higher scores represent more frequent victimization.

**Ecological Risk Indicators.** We created numeric scales to represent risk in each of three microsystems, family, peer group, and school. The *Family Risk Score* was based on a composite drawn from parent and child reports of *Parent Involvement in School*, *Parental Monitoring*,

*Discipline Practices, Family Relationships and Family Problem-solving. Parent Involvement in School* was assessed by combining child and parent reports on three scales from the Fast-Track Parent Involvement Questionnaire (Buhi & Goodson, 2007,  $\alpha = .69-.81$ ). *Parental Monitoring* was a composite scale derived from parent and child reports on the three subscales of the Parenting Practices Scales (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996;  $\alpha = .62-.81$ ). The *Discipline Practices* composite was a combination of two Parenting Practices subscales (*Discipline Effectiveness*, 5 items,  $\alpha = .77$ ; and *Discipline Avoidance*, 4 items,  $\alpha = .67$ ). The *Parental Monitoring* and *Discipline Practices* composites were formed according to published scoring procedures of the *Parenting Practices Scale* (Gorman-Smith et al., 1996).

*Peer Relations Risk* was assessed using two student-report scales. *Antisocial behavior of peers* was measured by the “Things that Your Friends Have Done” Scale (Conduct Problems Prevention Research Group {CPPRG}, 2000;  $\alpha = .86$ ). *Gang involvement* was measured by four items asking about gang membership also used by the Fast-Track Study (Conduct Problems Prevention Research Group {CPPRG}, 1992).

A composite variable for *School Risk* was produced from school-level means on four student-report scales that had been completed by students in the school-wide (general population) sample (see MVPP, 2009 or Miller-Johnson et al., 2004 for a description of the school-wide sample): (1) *School Norms for Aggression* ( $\alpha = .80$ ; Henry, Cartland, Ruch-Ross, & Monahan, 2004), (2) *Quality of Student-student Relationships at School* (4 items;  $\alpha = .66$ ; Vessels, 1998), (3) *Quality of Student-teacher Relationships at School* (7 items;  $\alpha = .61$ ; Vessels, 1998), and (4) *Teacher Awareness and Reporting* of violence and aggression problems (7 items;  $\alpha = .63$ ; Vessels, 1998). Higher scores on these scales indicated more positive norms, relationships and awareness of violence. Level-2 reliabilities at the school-level of analysis

ranged from .66 to .80, suggesting that the aggregated values provide substantial information about the school settings. We chose to use aggregated reports of the cohort-wide sample rather than individual reports from the subset of targeted students who were in both samples because the former procedure produced a measure of school risk that would shared the smallest amount of common source variance with the outcomes.

**Demographics.** Information about participants' gender, race, ethnicity, and family structure were assessed in the parent and child interviews. Information about participant's school, site, and grade were obtained from school records.

### **Descriptions of the Interventions**

The MVPP universal intervention is not the focus of this study, but is described here because half of the targeted sample would have been exposed to it by virtue of the schools they attended. The universal intervention consisted of a 20-session social cognitive curriculum for students combined with a teacher intervention that included training and ongoing consultation in violence prevention. The curriculum, administered by graduate students in psychology, education, or counseling, emphasized social-cognitive problem-solving strategies, and attitudes and norms favoring nonviolence. Review of fidelity data found that 95.4% of the planned elements of the universal intervention sessions were delivered. The teacher component included a 12-hour workshop and ten consultation/support group meetings, all of which were coordinated with, and aimed to support, the curricular intervention.

The MVPP selective intervention was conducted in groups of 4 to 8 high-risk students and their parent(s) or guardian over a period of 15 weeks (See Smith, et al., 2004 for details.). Multiple family groups were used to deliver the intervention efficiently and to capitalize on

participant capabilities to help others, normalize developmental and ecological challenges, and reinforce skill attainment and use (Tolan, et al., 2004).

The intervention was derived from prior prevention efforts that have shown significant positive effects for parents and children (Quinn, 2004; Tolan, et al., 2004). It progressed from initial orientation and basic parenting skills to problems in emerging adolescent relationships and school and educational concerns, to community-related issues. The goal was to improve parenting practices and family relationship characteristics previously empirically tied to risk for violence and other problem behaviors (Dishion & McMahon, 1999).

Fidelity, measured by site supervisor observations and reports of completion of key activities, was uniformly high (mean = 4.75, sd = 0.38 on a 5-point scale where 5 indicated that activities were completely implemented). All family members, including relatives who lived outside the home and had a significant role in caring for the child, were invited to attend sessions. Child-care and transportation were provided as needed and families were paid increasing amounts for attendance over the course of the intervention (\$10 to \$25 per session). Interventionists offered makeup sessions.

### **Data Analysis**

Our overall data analytic strategy was to fit two types of models using centered continuous moderators. Intent-to-treat (ITT) models preserve random assignment and provide tests of hypotheses from which the strongest causal inferences can be drawn. However, selective interventions frequently have participation rates that are substantially lower than the numbers randomly assigned to intervention; often in the 40% to 75% range, making intent-to-treat results prone to substantial influence from individuals who did not take part in the intervention (Dishion, et al., 2008; Spoth, Trudeau, Redmond, & Shin, 2008). For this reason, our second

type of analysis was weighted by actual participation (for those assigned to intervention) or predicted participation (for those not assigned to intervention). This strategy is similar to propensity score analysis and the complier average causal effect (Rosenbaum & Rubin, 1983; Yau & Little, 2001). Because intervention participation was best represented by a count of sessions rather than single binary variable, we estimated a predicted number of sessions for each family who were not assigned to receive the intervention. We used the Expectation-Maximization (EM) algorithm (Dempster, Laird, & Rubin, 1977) implemented in SAS PROC MI to impute dosage for those not assigned to intervention based on pre-intervention correlates of dosage, using demographic covariates and pretest measures as predictors.

We fit all models through SAS PROC MIXED (SAS, Version 9, 2005) using the centered continuous composite variables as moderators. First, we fit models for each individual contextual moderator. Next, we fit models in which family, peer, and school risk moderators were included in the same analysis. Early models included random slopes for each contextual risk factor that was measured at the individual level in the targeted sample (i.e., family risk and peer risk). None of these terms was significant, resulting in their removal in the final models. In addition to the pretest value of the outcome variable, terms for gender, ethnicity, family structure, and age cohort were included as fixed effects. Effect codes allowed the four study sites to be included in the analysis. We chose effect codes rather than a random intercept effect for study site because of the small number of sites. In addition, the interactions between site and cohort and between intervention condition and cohort were included. The only difference between the intent-to-treat models and the dose-weighted models was the use of the weights based on actual or predicted sessions attended. If significant evidence of moderation was found,

our plan was to re-code the moderator to a binary variable and re-fit the model in order to facilitate interpretation.

## **Results**

### **Selected Sample Characteristics and Comparability across Conditions.**

Table 1 summarizes the characteristics of this study's sample (students and their families). The sample was approximately two-thirds male and 85% of minority ethnicity. Sixty-one percent indicated that an adult male lived in the home. Rates of participation in assessments did not vary by condition. Table 1 also reports baseline scores on risk and outcome variable by condition. Pretest comparisons found no differences by random assignment condition.

### **Moderated Models of Selective intervention Effects**

Those at schools assigned to the selective intervention were compared to those at schools not so assigned. That is, we combined the selective only and universal + selective conditions, and compared them to the control and universal only conditions. As is noted above, we conducted two types of analysis, the first based on an intent-to-treat approach, and the second weighting each observation by the individual's actual participation (if assigned to intervention) or predicted participation (for those not assigned to intervention). Effects represent each predictor's relation to posttest scores on the outcome variable controlling for pretest values (thus change in the outcome). Models employed the Kenward-Roger small sample approximation to degrees of freedom (Kenward & Roger, 1997), which adjusts the degrees of freedom by the estimates of the variance components, and were fit using full maximum likelihood estimation to permit model comparison. Standardized mean difference effect size estimates were calculated using the *t*-values and numbers of observations.

**Unweighted intent-to-treat analyses.** First, separate models were fit for family, peer,

and school risk, returning a moderated effect for peer risk on the physical aggression composite ( $B = -0.10$ ,  $SE=0.05$ ,  $t(1159)=2.13$ ,  $p < .05$ ,  $d=-.13$ ). Models with all moderators included are reported in Table 2. These models found that the significant moderating effect of peer risk remained ( $B = -0.10$ ,  $SE=0.05$ ,  $t(1129)=2.06$ ,  $p < .05$ ,  $d=-.12$ ). In order to aid interpretation through graphical examination of the interaction, we dichotomized the peer risk variable.

Because the half of the participants had peer risk scores of zero, we plotted any indication of peer risk vs. no indication of peer risk by intervention condition. We then used tests of differences in adjusted cell means to determine the nature of the interaction. As can be seen in Figure 2, the difference between the conditions receiving the selective intervention and others was significant only within the group that had high pre-existing peer risk,  $M_{diff} = -0.03$ ,  $SE=0.01$ ,  $t(1167)=2.90$ ,  $p < .01$ ,  $d=-.17$ .

**Dose-weighted analyses.** As in the unweighted analysis, the intervention effect moderated by peer risk was significant for physical aggression in the weighted analysis,  $B = -0.20$ ,  $SE=0.06$ ,  $t(1129)=3.25$ ,  $p < .01$ ,  $d=-.19$ . In addition, an intervention effect moderated by peer risk was found for non-physical aggression in the weighted model,  $B = -0.13$ ,  $SE=0.05$ ,  $t(1111)=2.46$ ,  $p < .05$ ,  $d=-.14$ . The weighted analyses also returned an intervention effect moderated by peer risk on relational victimization,  $B = -0.19$ ,  $SE=0.08$ ,  $t(1012)=2.43$ ,  $p < .05$ ,  $d=-.14$ . As can be seen in Table 2, similar effects were found in the models that included all moderators in the same analysis;  $B = -0.05$ ,  $SE=0.02$ ,  $t(1113)=2.98$ ,  $p < .01$ ,  $d=-.17$  for physical aggression;  $B = -0.04$ ,  $SE=0.01$ ,  $t(1113)=2.82$ ,  $p < .01$ ,  $d=-.17$  for non-physical aggression; and a marginal effect for relational victimization,  $B = -0.03$ ,  $SE=0.02$ ,  $t(1110)=1.65$ ,  $p < .10$ ,  $d=-.10$ . We found no significant intervention effects moderated by family or school risk in the weighted models.

## Discussion

This study tested for moderation of a selective middle-school violence prevention intervention by measures of three key microsystems (family, peer, school) thought to affect development (Bronfenbrenner, 1972, 1979). Intent-to-treat analysis and comparisons weighted by exposure to the intervention found moderation by the peer microsystem only. Dose-weighted analyses found significant moderation in three of the four outcomes, compared to one out of four in the intent-to-treat analyses. The intent-to-treat approach preserves the randomness of assignment, and thus permits strong causal inference. However, the typically moderate levels of attendance that have characterized this type of intervention in multiple studies can result in estimates of effects that are depressed by noise due to nonparticipation. Thus, although ITT effects are more trustworthy for causal inference, stronger effects are to be expected with the weighted approach. Taken together, results of the ITT and weighted models suggest that the moderation is of the intervention as delivered and is not an artifact of unspecified accompanying characteristics related to random assignment. The intervention appears to prevent the expected increase in aggressive behavior at the beginning of middle school among those at high pre-existing peer risk. The moderation by peer risk level occurs even though this is an intervention that is family-based and targets risk processes located in family relationships and family management of the developmental ecology.

Thus, this set of analyses augments prior findings suggesting moderation of intervention effects by pre-existing risk (Farrell, et al., in press), and locates such moderation within the peer microsystem. By theoretically organizing risk factors into microsystems, these findings provide a more direct link between developmental-ecological understanding of risk and intervention impact. In this case, the specific implication is that peer risk may be particularly important in

whether or not a selective intervention benefits high-risk youth. It is not clear if this pattern of results are limited to this particular intervention, the selection criteria, or this age period, these results do suggest that Bronfenbrenner's (1972) ecological model is helpful in elaborating understanding of prevention effects.

When considering the implications of these findings, it is important to recall that selection of students for the intervention was based in part on consideration of their role in the overlapping school and peer microsystems, i.e., their social influence. The intervention was intended to reduce aggression and violence involvement among students who were thought to have an ecological role of influencing norms and behavior of other students at school. The moderated effect found in this study may be partly due to peer-risk being particularly salient for these socially-influential students.

Another implication of these findings is that it may be practically impossible to obtain a pure measure of a single microsystem, or to intervene to change one microsystem without affecting others. The fact that moderated results were obtained only for peer risk may or may not indicate that the moderation is limited to the peer microsystem. Microsystems interact in the mesosystem, and risk in one microsystem may be the result of deficiencies in another. Such a conclusion is consistent with the Confluence Model suggesting that coercive parenting may result in peer rejection and affiliation with deviant peers (Dishion, Patterson, & Griesler, 1994). In this study, we found that peers can affect the impact of a preventive intervention designed to affect processes of another microsystem (family). Similarly, we included parental involvement in school as an indicator of positive family microsystem characteristics, and although characteristics of the parent-peer mesosystem were not explicitly measured, the intervention included sessions devoted to helping parents monitor their children's peer relationships.

Another implication is that ecological moderation in prevention may be provincial rather than global in nature. That is, although moderation by ecological risk in general is to be expected, because of the interdependent nature of ecological microsystems in measurement and intervention, exactly where moderation will be detected and its specific form may be somewhat idiosyncratic to the specific intervention, setting, and measurement strategy. These results are somewhat at variance to prior findings about moderation of intervention effects (Farrell, et al., in press). For example, our finding that intervention effects were not moderated by pre-intervention family risk differs from a prior study that found different effects for families entering the intervention with greater family risk (Tolan, et al., 2004). That study differed from the present study in three ways: (1) The sample for that study was selected from communities with high levels of poverty and crime; (2) the intervention was delivered to all students rather than to a targeted sample; and (3) the children were younger (entering first grade; Tolan et al., 2004). The specific inconsistency between the present and past moderated findings could be due to developmental differences between first grade and middle school in the importance of peer and family influences.

Similarly, we found no evidence for moderation by school risk. This result differs from a prior prevention trial that found effects for a family intervention on which the present selective intervention was based. However these effects were found only among schools in a lower risk district (MACS, 2002). In that study, differences in school climate were found to moderate delivery of a universal curricular intervention (Gregory, Henry, Schoeny, & The Metropolitan Area Child Study Research Group, 2007). Additionally, the previous study found its effects only among early grade children (MACS, 2007; 2002).

Thus, the differences in findings regarding moderation by family risk or school risk

should not be taken to reduce the importance of these microsystems in understanding prevention and its effects. Rather, these findings should underscore the importance of considering multiple microsystems and their interactions, even when endeavoring to change a single one.

### **Limitations**

There are limitations that should be considered in interpreting the results. Participation rates were at a level that strained the capability of intent-to-treat analyses to test the efficacy of the intervention, despite high fidelity and little evidence from prior analyses of variation in effects due to fidelity or facilitator-participant engagement levels (MVPP, 2009b, 2009c). The weighted exposure analysis helps mitigate that uncertainty by providing a juxtaposed comparison that provides a different perspective than the intent-to-treat approach.

One other limitation is pertinent. Measurement level and source diversity were not consistent across the microsystems. School risk, peer risk, and family risk all were measured from different sources (i.e., whole school, individual, and family respectively). Only school risk included data from students in the randomly-selected cohort-wide sample.

Third, we limited these analyses to the intervention year. This was necessary because half of the targeted sample moved from their original schools in later study years, and we had no source of ecological information on the new schools of those who moved. Our interest in this study was in moderation of family intervention effects by pre-existing ecological risk. This sample cannot address the question of how an intervention would interact with ecological risk as a time-varying variable.

A fourth limitation is that the moderated effects we found were quite modest, most in the  $d = .10$  to  $.20$  range. It is useful to remember that small effect sizes and low power are to be expected in studies of moderation (McClelland & Judd, 1993), and that the effect sizes for the

continuous moderators tested in this study, represent the predicted increase in the effect of the intervention for each unit increase in the moderator.

### **Conclusion**

These analyses add to prior findings from this prevention trial indicating that impact of this selective family-focused intervention is greater when there is elevated ecological risk among the targeted sample. These analyses evaluated the moderating role of risk in specific microsystems highlighted in Bronfenbrenner's developmental-ecological approach (Bronfenbrenner, 1979). While the present results point to the importance of the peer microsystem, more generally they suggest that prevention research should conceptualize and measure multiple microsystem in order to more readily embed understanding of prevention effects in a valuable ecological model (Kellam & Langevin, 2003).

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Table 1

*Comparison of Participant Characteristics (%s) and Pretest Means on Outcome Measures*

Demographic Variables	<u>Control</u>		<u>Selective</u>	
	% or M	95% CI	% or M	95% CI
Sex (% male)	64.45%	60.2 – 68.7	64.98%	61.0-69.0
Adult male in household	62.25%	57.9-66.6	60.37%	56.3-64.5
Ethnicity				
African American	70.14%	66.1-74.2	73.23%	69.5-77.0
Hispanic Non-African-American	16.32%	13.0-19.6	12.27%	9.5-15.0
Risk Variables				
Family	0.63	.62-.63	0.62	.61-.63
Peer	0.09	.07-.10	0.09	.08-.10
School	0.59	.58-.60	0.59	.58-.60
Pretest Measures				
Composite Aggression	0.43	0.42-0.44	0.43	0.42-0.44
Composite Violence	0.29	0.27-0.30	0.29	0.28-0.30
Overt Victimization	0.22	0.20-0.24	0.21	0.19-0.23
Relational Victimization	0.17	0.15-0.19	0.16	0.15-0.18
Total Victimization	0.19	0.17-0.21	0.18	0.16-0.19

Table 2

*Moderated Effects with All Moderators in the Model*

Effect	<i>Unweighted analyses</i>			<i>Dose weighted analyses</i>		
	<i>B</i>	<i>SE</i>	<i>d</i>	<i>B</i>	<i>SE</i>	<i>d</i>
Physical Aggression						
Selective Intervention	-0.06	0.06	-0.07	0.02	0.01	0.31
Moderated by Family Risk	0.04	0.08	0.03	0.00	0.02	0.00
Moderated by Peer Risk	-0.10*	0.05	-0.12	-0.05**	0.02	-0.17
Moderated by School Risk	0.05	0.06	0.09	-0.03	0.02	-0.10
Non-physical Aggression						
Selective Intervention	-0.07	0.05	-0.09	0.02	0.01	0.32
Moderated by Family Risk	0.08	0.07	0.07	-0.01	0.02	-0.02
Moderated by Peer Risk	-0.05	0.05	-0.07	-0.04**	0.01	-0.17
Moderated by School Risk	0.02	0.05	0.05	0.00	0.02	-0.01
Overt Victimization						
Selective Intervention	-0.11	0.08	-0.08	-0.02	0.02	-0.17
Moderated by Family Risk	0.08	0.11	0.04	-0.04	0.03	-0.08
Moderated by Peer Risk	0.02	0.08	0.02	0.00	0.02	0.00
Moderated by School Risk	0.05	0.09	0.04	0.00	0.03	0.01
Relational Victimization						
Selective Intervention	-0.04	0.07	-0.04	0.00	0.08	0.00
Moderated by Family Risk	-0.01	0.10	0.00	-0.08	0.10	-0.05
Moderated by Peer Risk	-0.07	0.07	-0.06	-0.03+	0.02	-0.10
Moderated by School Risk	0.06	0.08	0.05	0.07	0.09	0.06

+ p &lt; .10. \* p &lt; .05

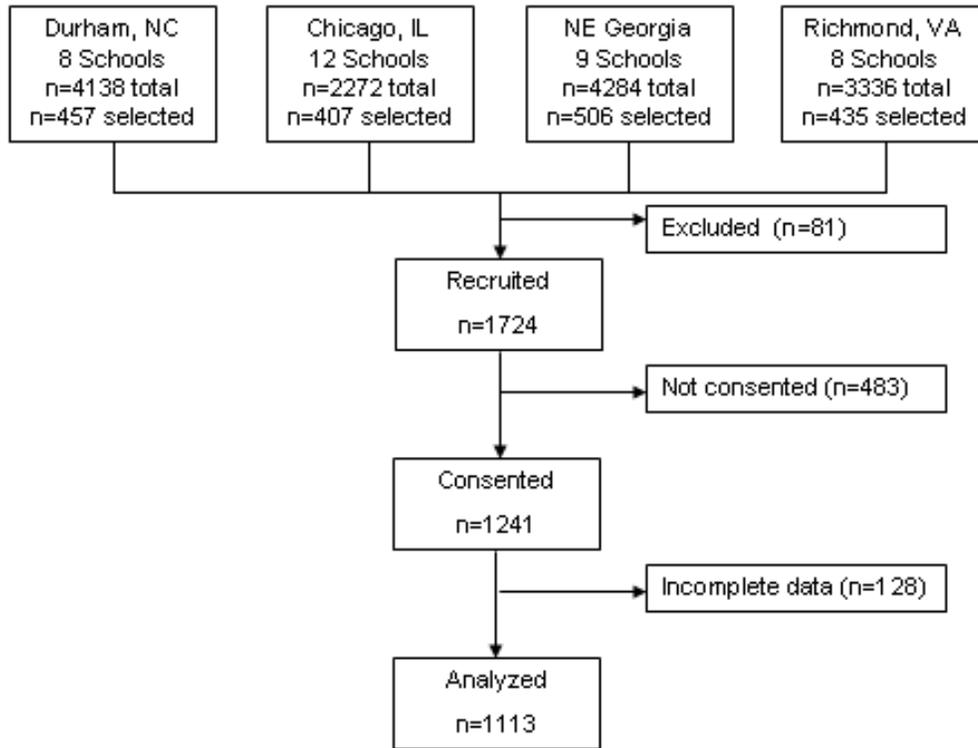


Figure 1. CONSORT chart illustrating subject recruitment and retention.

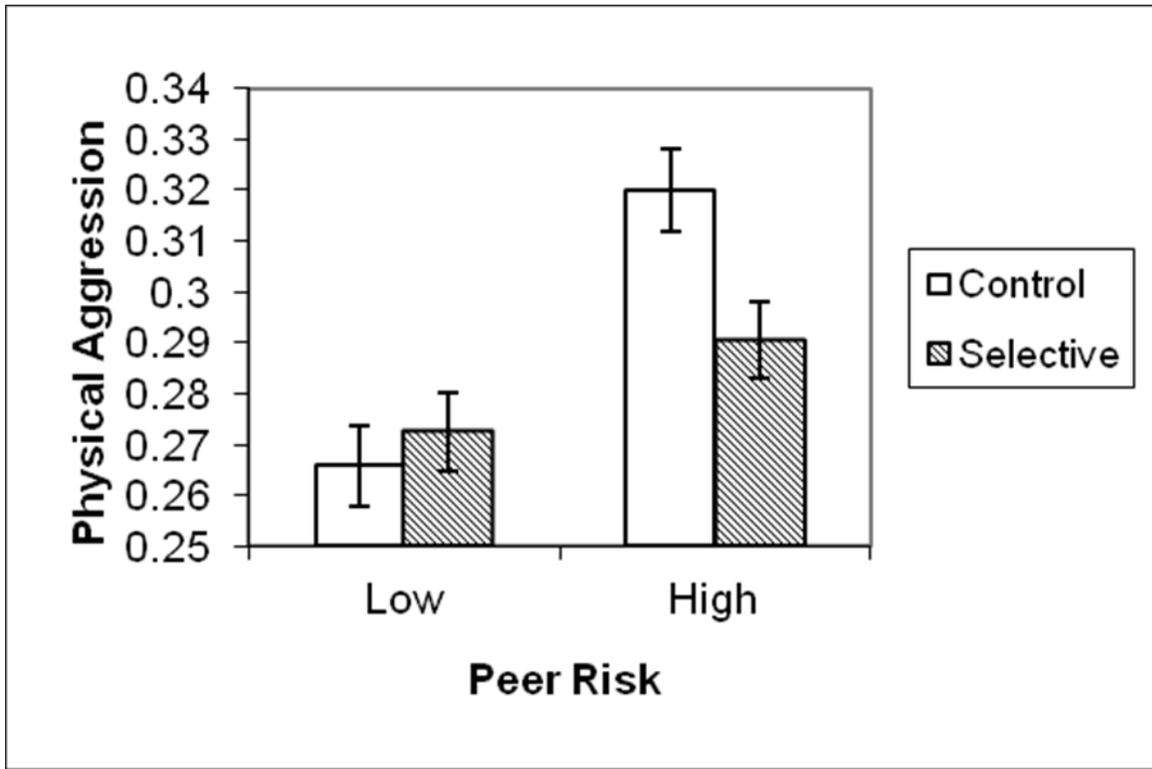


Figure 2. Moderation of Intervention Effects on Physical Aggression by Peer Risk.