

PREDICTORS OF FAMILY PARTICIPATION IN A MULTIPLE FAMILY GROUP INTERVENTION FOR AGGRESSIVE MIDDLE SCHOOL STUDENTS

William H. Quinn

College of Health, Education, and Human Development, Clemson University

Dan B. Hall

Department of Statistics, University of Georgia

Emilie P. Smith

Center for Family Research in Diverse Contexts, Penn State University

David Rabiner

Center for Child and Family Policy, Department of Psychology and Neuroscience, Duke University

This study was funded by the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, CDC Cooperative Agreements U81/CCU417759 (Duke University), U81/CCU517816 (University of Chicago-Illinois), U81/CCU417778 (University of Georgia), and U81/CCU317633 (Virginia Commonwealth University). The authors want to recognize the contributions of the originators of the Multisite Violence Prevention Project (MVPP). Without the collaborative work of this talented and dedicated team this project would not have been possible. The members of the MVPP project are listed below according to their original affiliation with their current affiliation noted in parentheses. The MVPP (corporate author) includes: Centers for Disease Control and Prevention, Atlanta GA: Thomas R. Simon, PhD; Robin M. Ikeda, MD, MPH (National Center for Injury Prevention and Control; Emilie Phillips Smith, PhD (Penn State University); Le'Roy E. Reese, PhD (Morehouse School of Medicine); Duke University, Durham NC: David L. Rabiner, PhD; Shari Miller-Johnson, PhD; Donna-Marie Winn, PhD (University of North Carolina – Chapel Hill); Kenneth A. Dodge, PhD (Center for Child and Family Policy); Steven R. Asher, PhD (Department of Psychology and Neuroscience); University of Georgia, Athens GA: Arthur M. Horne, PhD (Department of Counseling and Human Development Services); Pamela Orpinas, PhD (Department of Health Promotion and Behavior); Roy Martin, PhD (Dept. of Educational Psychology and Instructional Technology); William H. Quinn, PhD (College of Health, Education, and Human Development, Clemson University); University of Illinois at Chicago, Chicago IL: Patrick H. Tolan, PhD (University of Virginia); Deborah Gorman-Smith, PhD; David B. Henry, PhD; Franklin N. Gay, MPH, Michael Schoeny, PhD (all Institute for Juvenile Research, Department of Psychiatry); Virginia Commonwealth University, Richmond VA: Albert D. Farrell, PhD; Aleta L. Meyer, PhD (National Institute on Drug Abuse); Terri N. Sullivan, PhD; Kevin W. Allison, PhD (all Department of Psychology). Correspondence to: William Quinn, 430 Edwards Hall, Clemson, SC 29634. E-mail: wquinn@clemson.edu

The authors examine predictors of family participation in the G.R.E.A.T. Families Program of the Multisite Violence Prevention Project (MVPP), a four-site collaboration examining student, teacher, and family interventions for middle school students. Teachers recruited two cohorts of sixth grade students, recognized as being aggressive and influential with their peers, and their families into a voluntary, 15-session weekly program. Among the 643 families that consented (66%), the mean number of sessions attended was 8.13, with almost half (48.3%) attending 11 or more sessions. Linear mixed models (LMMs) were developed to predict the number of sessions attended based on a cluster of demographic variables and scales designed to measure aggression, problem behaviors, family factors, and other psychosocial constructs. Three of the nine clusters held significance when associated with attendance: level of aggression as rated by the child (negative association), parent-child bond (negative association), and level of child victimization (positive association). Somewhat surprisingly, the variance component due to interventionist turned out to be small and to constitute a nonsignificant component of the overall variability in attendance. Results suggest that family recruitment for multiple family group programs can be achieved with substantial effort and that resources available for recruitment might be differentially applied across families based on predictors of attendance. © 2010 Wiley Periodicals, Inc.

Having gained acceptance in the last few years is the importance of family-based approaches to prevention of child behavior problems, violence, and substance abuse. The crucial role that families play in school success and children's social and emotional development has led to the growth of school services to families (Dishion & Kavanagh, 2003; Quinn, 2004). Parent educators, school administrators, health professionals, and mental health therapists are aware of the importance of the family's influence on a child's educational success and social and emotional development. There is some support that dosage, the number of treatment components a family is exposed to, does affect the likelihood of better outcomes related to externalizing behavior among children (Beauchaine, Webster-Stratton, & Reid, 2005; Becker, Hogue, & Liddle, 2002). However, a major obstacle to successful family-based preventive or early-stage interventions for behavior problems is achieving sufficient attendance at program sessions (August, Realmuto, Hektner, & Bloomquist, 2001).

CHALLENGES TO FAMILY PARTICIPATION IN SCHOOL PROGRAMS

Meeting the recruitment challenge is even more crucial when children who demonstrate the most severe behavior problems are in families who are most reluctant to engage in school-based programs. Challenges to recruit families in contemporary society are formidable, including economic hardships and job demands for parents, prevalence of family transitions such as divorce and geographic relocation, and the time demands on household task completion and the availability of a range of options for spending leisure time. Television, community and religious activities, athletic programs, as well as work demands for parents, represent sizable challenges to

enlisting the involvement of families in intervention programs; hence, to increase the likelihood of effective family intervention via high participation requires an exploration of the factors that affect a family's level of attendance in intervention programs. Examining this important issue was the focus of the current study.

It is well known that the successful implementation of family programs in school settings is often severely hampered by low levels of participation among families. Possible causes of this lack of participation include low motivation of families due to severity of child problem behaviors, personal stress, family disorganization, mistrust of professionals, parental lack of understanding of their child's difficulties, or a low priority on the educational value of school programs for their children (Gorman-Smith et al., 2002; Quinn & VanDyke, 2004). The school's reputation with parents may also be influential in decisions to participate. The experiences of parents with schools, such as school failures by the parent or child, or frustrations of parents in previous school interactions, may result in the harboring of feelings of inadequacy, ambivalence, or even hostility. Institutional barriers also exist. There can be parent barriers to program participation, such as childcare, transportation, cost that can interfere with program attendance, and psychosocial factors of parents. More recently, a community-university partnership to address the myriad number of factors that determine family participation has been demonstrated to achieve high recruitment rates despite the challenges of competing community and school district administrative and contextual factors (Spoth, Clair, Greenberg, Redmond, & Shin, 2007).

Because family factors do serve a protective function related to child aggression, and parenting practices can influence externalizing behavior, these constructs were examined because they could provide information to schools that could conceivably contribute to successful and efficient family recruitment strategies. In general, families may be suspicious of prevention efforts, associating them with social agencies that can be viewed as condescending and uninformed of the circumstances of the child and family's life. These families require extensive engagement efforts and problem-solving strategies to ensure participation. Gorman-Smith and colleagues (2002) proposed five domains as useful in understanding family participation in preventive interventions: (a) demographic characteristics such as socioeconomic status, ethnicity, education, and marital status; (b) personal characteristics of the parent; (c) parenting behaviors; (d) characteristics of the child; and (e) parental stress. These constructs are examined in this study.

STUDY DESIGN

Family Information Known by Schools

First, we wanted to know who attends family-based programs for high-risk students. In particular, we examined descriptive data among families nominated including income, family structure (e.g., presence of a man), race/ethnicity, and education. Our purpose was to identify family factors that might be readily known to schools that could be utilized to develop potentially effective strategies for recruiting families and using recruitment resources efficiently (e.g., staff time to interact with families, use of parent-teacher conferences).

Family Information Not Readily Known by Schools

Second, we explored the motivations families might have for choosing to participate, including child behavior problem severity as well as skill sets (e.g., leadership skills), family relationship processes and parenting practices, and life circumstances such as life stress and parent depressive symptoms. In addition to developing potentially useful strategies for recruiting families, this set of variables provides an examination of possible causal factors that influence family intervention attendance recognizing that such information may or may not be known by school staffs planning and implementing recruitment strategies. We conducted an analysis incorporating the severity of aggressive behaviors of the children nominated by their teachers because this set of behaviors (externalizing, conduct problems, delinquent tendencies) is observed daily by the teachers who nominated the students in this study and, thus, can be known by the school and used to formulate family recruitment strategies. In addition, the severity of child behavior problems is associated with intervention outcome and is mediated by attendance (August, Egan, Realmuto, & Hektner, 2003). The presence of child and adolescent behavior problems in a family can increase parent motivation to participate in family-based programs and even increase compliance with homework assignments in intervention programs (Spoth & Redmond, 1995).

Although most studies on this topic examine child risk factors and level of attendance, it is not often that positive traits are examined. In this study, an examination of leadership and social skills of children provided an opportunity to assess positive child attributes and level of program participation. Children who possess leadership skills with an interest in school-based involvement may have a positive effect on their parents' decisions to participate in a family program. Children with greater social skills may also possess the confidence to participate successfully in a group program such as the one under study.

Interventionists

The characteristics and skills of the interventionist may impact the participation of families. Evidence continues to mount that a therapist or group leader who exhibits warmth, support, and caring contributes to good outcomes and that defensiveness negatively affects outcome. Research and clinical evidence suggests that the therapeutic relationship is a much larger influence on successful outcomes than is often considered in treatment process (Hubble, Duncan, & Miller, 1999). The therapeutic alliance has been shown to relate to therapeutic outcome (Quinn, Dotson, & Jordan, 1997), and alliance-building interventions such as attending to the adolescent's experience, formulating personally meaningful goals, and presenting oneself as the adolescent's ally foster a more intensive experience (Diamond, Liddle, Hogue, & Dakof, 1999). In family treatment of adolescent substance abusers, stronger alliances between both the adolescent and therapist and mother and therapist led to a higher completion rate (Robbins et al., 2006). Perceived benefits that parents hold about a family program can influence participation (Spoth & Redmond, 1992) as well as the level of expertise of the interventionist as viewed by the parent, such as knowledge of child development. Although these characteristics are not measured specifically, it can be assumed that the presence of these skills in greater amount may influence family decisions to attend a family program.

METHOD

The data from this study come from the Multisite Violence Prevention Project (MVPP) that was comprised of four universities and funded by the Centers for Disease Control and Prevention (Multisite Violence Prevention Project, 2004). The purpose of the MVPP was to evaluate the impact of both universal (classroom) (Multisite Violence Prevention Project, 2008) and selective (family) interventions (Multisite Violence Prevention Project, 2009) in schools both separately and combined to assess aggression in middle schools. A 2×2 cluster-randomized experimental design was applied in which schools within four distinct sites in the United States were assigned randomly to one of four conditions. Two cohorts of sixth grade students in 37 schools participated in the study. Although data for the larger project were collected in multiple waves from teachers, students, parents, and archival sources, the subset of data for this study were drawn from the initial preintervention assessments for two cohorts made during the fall of the sixth grade year in 2001 and 2002.

Sample and Family Recruitment Protocol

This study examined only the data collected on families identified for the targeted (family) intervention (Smith et al., 2004) in those schools in which the family intervention was offered. Sixth grade teachers were asked to nominate students after 6–8 weeks of the school year on the basis of two criteria: (1) their observations of aggressive and disruptive behavior in the classroom, and (2) the student's relative level of influence on other students. The latter criterion was included because an objective of the larger study was to determine whether changing the behavior of aggressive and influential students would result in lower rates of aggressive behavior across the entire grade. In the fall of each of the two school years in which the G.R.E.A.T. (Guiding Responsibility and Expectations for Adolescents for Today and Tomorrow) Families Program was offered (Multisite Violence Prevention Project, 2004), sixth grade teachers were asked to review a list of behaviors (e.g., encourages other students to fight, frequently intimidates other students, has a short fuse/gets angry very easily, gets into frequent physical fights, spreads rumors about peers) and to list students in their classroom who exhibit these behaviors most often. On the basis of this list, teachers were asked to rate each student on their level of influence using a 5-point scale with 1 being *not influential at all* and 5 being *very influential*. Students recruited for the family program were those aggressive/disruptive students with the highest influence rating until the maximum to be included per school (varied slightly by school enrollment) for recruitment was reached. In examining the validity of this process with one site of the four in this study, it was found that convergent validity was demonstrated by the high correlation of teacher ratings of peer influence and peer nominations for social influence, and that the teacher ratings of influence indicated "acceptable sensitivity and specificity" when predicting peer nominations of influence among the most aggressive children (Henry, Miller-Johnson, Simon, Schoeny, and The Multi-site Violence Prevention Project, 2006).

Given that there are substantial recruitment and retention challenges in family-based programs as well as longitudinal research (Prinz et al., 2001), several steps were carefully considered in the process of recruiting families whose children were nominated by teachers for the 15-weekly session G.R.E.A.T. Families Program. A shared goal among the project directors and staff who supervised recruitment

personnel was to create strategies that would increase the probability of consent and attendance in the G.R.E.A.T. Family Program. First, letters were sent to the families by the school outlining the nature of the program and explaining why they were asked to participate. These letters were the same for all schools and sites. Second, the group leaders and other trained recruiters followed up by telephone or with a home visit. The telephone script used by recruiters to form each family program of 4–6 families was prepared and applied consistently across sites after extensive training on recruitment (approved by the Institutional Review Boards of all individual sites as well as the Centers for Disease Control and Prevention). To encourage family participation, meals and childcare were provided at each session, transportation was arranged for families who required it, and families received a small stipend for each session they attended. These strategies addressed known predictors of previous attendance failures. Group leaders contacted families by phone between sessions to encourage their attendance at the next session. Family group leaders were professionals from the disciplines of social work, school counseling, psychology, and family therapy.

In the schools that offered the G.R.E.A.T. Families Program, in the first year (cohort 1), among 418 families eligible, 267 (64%) consented to participate. In the second year (cohort 2), there were 376 families among 562 (67%) who gave consent to participate in the family program. Thus, across the two cohorts, 643 of 980 eligible families, or 66%, consented to participate. This rate compares favorably to the 57% reported in a study of high risk youth into a family-based prevention program for psychosocial problems (Hogue, Johnson-Leckrone, & Liddle, 1999). In the analyses in this study, we examine the characteristics that predicted attendance at family sessions from within this subset of eligible families who consented, as opposed to the entire sample of eligible families. We could not conduct analyses based on all eligible families because the data of interest were only available on families who consented. Following consent, home visits were scheduled with the parent or caregiver (e.g., grandparent) of the child to administer surveys to both the parent/caregiver and child using a laptop computer-based survey administration procedure. Only one parent or caregiver per family was involved in the data collection.

Measures

Following the model suggested by Gorman-Smith et al. (2002), five domains were investigated as predictors of family participation: (1) demographic characteristics, (2) characteristics of the parent, (3) parenting behaviors, (4) characteristics of the child, and (5) parental stress. These measures employed within each domain are described below. Further detail on these measures is described in a previous report (Miller-Johnson, Sullivan, Simon, and The MVPP, 2004).

Demographics

Four demographic variables were considered: race/ethnicity, family structure, income, and education. Race/ethnicity was categorized as White, non-Hispanic; African American, Non-Hispanic; Latino; and other. The family structure variable was comprised of five categories: two-parent family (A); single parent with either step-parent, parent's significant other, or parent's parent (B); single parent with or without other adults (C); adult relative with neither parent (D); foster family or other (E). In this way, we could examine the potential benefit of more than one adult in the household,

as it may be that families with more than one adult would find it easier to participate than single parent families because of their ability to share parenting responsibilities. Unfortunately, the question does not allow a categorization of single parents solely; however, category C included a majority of predominately single mothers without additional adults in the household. The variable of income was defined as an indicator of whether a family's income during the past 12 months by all members of the household was above the poverty level for a family of that size.¹ Education was measured by asking parents to report their highest completed grade or year of school. The range of response options were eighth grade or less, some high school, high school graduate or general equivalency diploma (GED) certificate, some post high school, college graduate (Associate or Bachelors), and postgraduate education. Although this is an ordered categorical variable, we treated it as a continuous covariate in our analyses. This was done to reduce the number of covariate classes in our models and can be partially justified by the fact that these education levels are roughly evenly spaced with respect to the underlying variable—years of education.

Parent Involvement in School

There are three subscales of this measure: parent involvement with teacher, teacher involvement with parent, and parent involvement with child. It was hypothesized that high parent involvement in school would result in greater family participation in the program. Examples include “How often do you talk with one of your child's teachers?”; “How often does the teacher provide information to you on how your child is doing in school?”; and “How often do you check your child's homework?”. Cronbach's alphas were .77, .80, and .81 for parent's involvement with school, teacher involvement with parent, and parent's involvement with child, respectively, for this sample.

Personal Value on Achievement

Both the parent's and child's views of personal value on achievement were considered separately because families who regard education as important might be more interested or committed to participating in any school sponsored program that could be perceived as helping promote academic success. Children who become aware of a school program in which they are invited may express their desire to participate to their parents if they possess a strong desire to achieve in school. Examples include “To get at least a B average this year”; “To have good enough grades to go to college”; “To do better on tests than most of the other students.” The measure was found to have acceptable internal consistency for both students and parents with only a modest correlation ($r = .21$) between students and parents. Cronbach's alphas were .84 for the students and .93 for the parents.

Parent Depression

The presence of emotional difficulties by a parent has been studied as a contributor to parenting difficulties and family involvement. This measure, from the Center for Epidemiological Studies (Radloff, 1977), is a 20 item scale that assesses parents'

¹We also examined whether there was any association between intervals of income (<\$5,000, \$5,000–\$10,000, ..., \$60,000–\$70,000, >\$70,000) and found that there was no relationship to family attendance in the program.

depressive symptoms such as poor appetite, hopelessness, restless sleep, and loneliness in the week prior to the survey. The four factors of depressed affect, positive affect, somatic/retarded activity, and interpersonal were derived from a principal component factor analysis with varimax rotation. The Cronbach's alpha for this sample was .90.

Family Relationships Scale

This scale quantifies four aspects of family relationships that distinguish risk for serious antisocial behavior (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996). There are four subscales used in the analysis: structure, cohesion, beliefs about the family, and deviant beliefs. Alphas for these four subscales were: .74, .84, .82, and .78, respectively.

Parenting Practices Scale

The Parenting Practices Scale (Gorman-Smith et al., 1996) assesses parents' behavior toward their children. The items administered to parents in the MVPP study comprised five subscales whose item count and internal consistency reliabilities of the scores were as follows: extent of monitoring and involvement in the child's life (12 items, $\alpha = .80$), supervision and rules (2 items, $\alpha = .71$), positive parenting (6 items, $\alpha = .78$), discipline effectiveness (5 items, $\alpha = .77$), and discipline avoidance (4 items, $\alpha = .67$). The items administered to the targeted youth in the MVPP study comprised three subscales with the same item count as the corresponding parent scales. The internal consistency reliabilities of the scores were as follows: extent of monitoring and involvement in the child's life ($\alpha = .80$), supervision and rules ($\alpha = .62$), and positive parenting ($\alpha = .81$).

Child Characteristics

Behavior assessment system for children (BASC). Child behaviors were assessed on aggression (tendency to act in a hostile manner), depression (feelings of unhappiness, sadness, and stress resulting in an inability to carry out everyday activities), conduct disorder (tendency to engage in antisocial or rule-breaking behavior, including destroying property), and leadership (skills associated with accomplishing academic, social, or community goals, including the ability to work well with others) subscales of the BASC (Reynolds & Kamphaus, 1992). Adequate psychometric properties have been reported (Reynolds & Kamphaus, 1992; Kamphaus et al., 1999). Alphas for these four subscales were .85, .81, .81, and .81, respectively. The Adolescent Form for these four subscales was used. The instrumentation was normed on 1090 parental ratings of adolescents aged 12 to 18 years from four regions of the United States.

Peer Deviancy Scale

This measure was adapted from a similar measure used by the Conduct Problems Prevention Research Group (2001). It assesses reports of friends' involvement in delinquency activity. In this study, the parent is asked about perceptions of the child's friends' involvement in 10 delinquent activities, from "one of them" to "all of them." The alpha for this scale for parents in this sample was .84.

Problem Behavior Frequency

This measure is based on the work of Farrell, Kung, White, and Valois (2000), Crick and Bigbee (1998), and Orpinas and Frankowski (2001). The scale of 47 items is divided into seven subscales that assess the frequency of problem behaviors within the last 30 days. These subscales including corresponding alphas are physical aggression ($\alpha = .81$), nonphysical aggression ($\alpha = .80$), overt victimization ($\alpha = .84$), relational victimization ($\alpha = .85$), drug use ($\alpha = .88$), relational aggression ($\alpha = .74$), and delinquency ($\alpha = .77$).

Life Stress

The extent of life stress experienced by a parent may influence the decision to agree to participate in a family education program. Fourteen items were developed by the Conduct Problems Prevention Research Group (1998) with six additional items developed in this project to reflect potential stressors in this sample. Life stress of the parent was measured by assessing 20 life stressors in the past 6 months. Examples of these items include “Have you had unexpected expenses?”; “Has someone in your family had problems with police or courts?”; and “Have you had problems with your neighbors?”. There are three different methods of scoring the 20 items in this scale: total number of stressors, total number of major stressors, and mean stressor rating. In this analysis, total number of major life stressors and mean stressor rating were both used. Individual items in this scale appeared quite relevant to the targeted parents, as participants in Cohort 1, for example, reported an average of 4.52 total stressors (range from 0 to 17). Cronbach’s alpha was .74 for targeted parents in this sample.

Family Attendance

Family attendance rates among subjects who consented to participate in the study ranged from the minimum (0) to the maximum (15) number of sessions possible. This variable was measured by simply totaling the number of sessions attended by the targeted student and one or more additional family members, and was found to have a sample mean of 8.15 sessions, with a standard deviation of 6.13 sessions. Attendance was kept by the group leader as a record to guide planning of retention strategies and for calculating the amount of the stipend to be paid to each family.

Interventionist

In this study, heterogeneity in attendance patterns across interventionists was investigated by treating interventionist as an explanatory factor in all statistical models. The levels of this factor (corresponding to the set of distinct interventionists involved in the study) were treated as random, rather than fixed, to allow us to quantify the variability in attendance that is due to interventionist differences and to allow generalization of our results to the population of interventionists represented by those individuals employed in this particular study.

Analyses

The natural response variable for analyzing participation in the G.R.E.A.T. Families Program is total number of sessions attended. For this variable, linear mixed-effect regression models were fit to describe the dependence of participation on the explanatory variables in two steps as described above.

First, attendance was regressed on demographic information including family structure, income, education, and race/ethnicity. In addition, because the GREAT Families Program was implemented at four sites in four different states in two consecutive school years, the design variables, site and cohort, were also included as explanatory factors. Finally, interventionist was also included as an explanatory factor with its levels modeled using random effects. This allows the estimation of a variance component due to interventionist, which (a) quantifies how much variability in attendance can be explained by differences between the family group leaders; and (b) gives the model a scope of inference (McLean, Sanders, & Stroup, 1991) that includes the population of all interventionists represented by those in the sample, rather than only those specific interventionists involved in the study.

Second, we expanded on the linear model to include psychosocial and behavioral constructs to investigate the motivations of participation. The MVPP, from which the data for this investigation were obtained, included a large number of scales. After identifying the important domains of potential predictor variables and selecting appropriate measures (listed above) within those domains, there remained a long list of scales and subscales from which to model attendance. Because of the probable redundancy (overlap) among many of these variables and concern over inflation of type I error associated with the inclusion of a very large set of regressors in our models, we first reduced the dimension of our predictor set via variable clustering methods. After variable clustering, each of the main clusters identified was represented in the regression analysis by the first principal component of the variables belonging to that cluster.

RESULTS

Results of the First Linear Mixed Model (LMM): Demographic Associations With Attendance

Results of the first regression model are summarized in Tables 1 and 2. Among the demographic and study design factors considered in the initial model, the significant predictors of attendance were education, family structure, cohort, site, and the two-way interaction between cohort and site. Education was found to have a positive effect on attendance with every additional level of education associated with an additional .533 sessions attended. Differences in attendance across family structures were also found to be significant and followed a pattern that was essentially consistent with expectations. In particular, family structure C, single-parent households, experienced the lowest level of attendance and was found to differ significantly from the highest

Table 1. Significant Predictors of Family Attendance (First Model)

<i>Explanatory variable</i>	<i>F Statistic</i>	<i>p-Value</i>	<i>B</i>	<i>SE</i>
Education	5.15	.024	.533	.235
Family structure	3.10	.015		
Cohort	23.77	<.001		
Site	11.76	<.001		
Cohort * Site	3.90	.010		
Interventionist				

Table 2. Estimated Mean Number of Sessions attended by Family Structure

<i>Family structure</i>	<i>M</i>	<i>SE</i>
A	9.02	.580
B	7.88	.545
C	7.46	.483
D	10.10	.915
E	8.35	1.78

Note. Significant differences between family structures A and C ($p = .0146$), B and D ($p = .0236$), and C and D ($p = .0038$).

attendance categories, A (two-parent families) and D (adult relative with neither parent). In addition, family structure B (single parent with other potential caregiver) was found to have significantly lower attendance than structure D.

Although cohort, site, and their interaction were found to have significant effects on attendance, detailed results concerning these factors are not presented because of the lack of generalizability of these effects beyond the current study. In summary, however, Cohort 2 experienced significantly higher attendance than Cohort 1. This was likely due to improvements in the administration of the G.R.E.A.T. Families Program from year 1 to year 2, and the credibility that the program gained in the schools over time resulting in increasingly more collaborative relationships between school personnel and the staff of the G.R.E.A.T. Families Program. In addition, there was a particularly large cohort difference between the 2 years of family recruitment at one of the sites, which was responsible for the significant cohort by site interaction in the model. This interaction was included because of known implementation difficulties during the first year at this site. Finally, the LMM included a random group leader effect to account for data clustering and to quantify interventionist variability in number of sessions attended. The variance component due to interventionist was estimated to be 1.27 with a Wald-based 95% confidence interval of (0.488, 8.04). The residual variance estimate was 29.79 with a corresponding 95% interval of 26.50, 33.74. In comparison to the unexplained error variance, interventionist effects were found to be a very small component of the overall variability in sessions attended.

Results of Variable Clustering of the Psychosocial and Behavioral Measures

Table 3 contains a summary of the variable clustering solution. The clustering algorithm used here was that implemented in PROC VARCLUS in SAS (Version 9.1). In particular, this procedure begins with all variables in a single cluster and then splits clusters until a stopping criterion is reached. Conceptually, this procedure attempts to split all clusters in which more than one underlying dimension is represented. At each step, a principal component analysis of the within-cluster correlation matrix is performed and the cluster with the largest second eigenvalue is chosen for splitting. Cluster splitting terminates when all clusters have second eigenvalues less than 1.

Each cluster is represented in further analyses by the cluster component, defined as the first principal component of the standardized variables belonging to that cluster. The nine cluster components of the final cluster solution obtained here explained a total of 66.8% of the total variation among the original 27 variables listed in Table 3.

A careful examination of the variable clustering solution summarized in Table 3 reveals that this procedure has led to a grouping of the variables into appealing and

Table 3. Results of Explanatory Variable Clustering

<i>Cluster</i>	<i>Original variables in the cluster</i>	<i>Cluster interpretation</i>
1	BASC Aggression (Parent rating)	Child behavior problems (parent rating)
	BASC Conduct Problems (Parent rating)	
	BASC Depression (Parent rating)	
2	Physical Aggression 30-day frequency	Child behavior problem events (child rating)
	Non-physical aggression frequency 30-day frequency	
	Relational aggression 30-day frequency	
	Drug use 30-day frequency	
	Other delinquent behavior 30-day frequency	
3	BASC Leadership (parent rating)	Parent-child bond
	Family cohesion scale (parent rating)	
	Positive Parenting Scale (parent rating)	
	Parental Monitoring, Involvement Scale (Parent rating)	
	Students Value on Achievement (Parent rating)	
4	Mean Life Stressor Ratings	Parent life stressors
	Total Number of Major Life Stressors	
5	Family Beliefs Scale (parent rating)	Family beliefs
	Family Deviant Beliefs Scale (parent rating)	
6	Overt Victimization 30-day Frequency	Child victimization
	Relational Victimization 30-day Frequency	
7	Parent Involvement with Child (Parent rating)	Parent involvement in school
	Parent Involvement with Teacher/School (Parent rating)	
	Teacher Involvement with Parent (Parent rating)	
8	CES-Depression Categorical Elevated Score	Parental depression
	CES-Depression Scale	
9	Supervision and Rules Scale (Parent rating)	Family discipline
	Discipline Effectiveness Scale (Parent rating)	
	Discipline Avoidance Scale (Parent rating)	

readily interpreted subsets. Subscales of measures essentially clustered together to comprise a conceptual schema. In addition, parent ratings of child aggression and child aggressive events clustered separately, whereas family discipline, beliefs, and nurturance (parent-child interaction quality) generated separate clusters as well. Finally, parent depression and stress clustered independently. These clusters provide some overlap with the five domains of predictors of family attendance offered by Gorman-Smith et al. (2002).

Results of the Second LMM: Psychosocial and Behavioral Associations With Attendance

To investigate the associations between psychosocial and behavioral associations and attendance, we expanded upon the model considered previously by retaining all of the demographic and design variables and adding the nine cluster components to the predictor set. Results of this second regression model are summarized in Table 4. The addition of the nine cluster components to the model resulted in no change to the set of demographic and study design variables that were found to be significant in the model. The inclusion of these additional variables substantially reduced the variability attributed to interventionist effects (from 1.27 to .397), but not the residual variance

Table 4. Significant Predictors of Family Attendance (Second Model)

<i>Explanatory variable</i>	<i>F Statistic</i>	<i>p-Value</i>	<i>B</i>	<i>SE</i>
Education	3.94	.048	.487	.245
Family structure	3.41	.009		
Cohort	26.22	<.001		
Site	16.32	<.001		
Cohort * Site	5.25	.002		
Cluster 2	5.23	.023	-.782	.342
Cluster 3	5.15	.024	-.283	.125
Cluster 6	5.14	.024	.638	.281
Interventionist				

(29.79 in the first LMM, 29.89 in the second). The cluster components that were found to be significant predictors of attendance in this model corresponded to clusters 2 and 3 (child behavior problem events and parent-child bond), which had negative associations with attendance, and cluster 6 (child victimization), which was positively associated with attendance.

Children who report more frequent child behavior-problem events were more likely to reside in families who chose not to participate in the G.R.E.A.T. Families Program. In addition, parents who report stronger parent-child bonds and expectations for student achievement were less likely to attend. A greater proportion of families whose children reported victimization were more likely to attend family sessions.

Though interpretation of the significant predictors of session attendance is important, also of note is what variables often conceptualized to explain participation rates were not found to be predictive of family attendance. Foremost in our view, we found that life stress experienced by the parent and elevated parent depression did not contribute significantly to either model. This is noteworthy because there is often an assumption that family involvement in educational or psychoeducational programs is impeded by the personal troubles or difficulties in managing daily life experienced by parents who make the decisions about involvement. These parents may view an option to attend a family program as a burden that “eats into their time” or will make them “spill their guts.” Some parents with personal difficulties may also be tempted to attribute responsibility for their predicaments to others and not fully muster sufficient determination to make changes to help their children. Families may possess doubt that “outsiders’ (e.g., group leaders) have the capacity to understand and empathize with the challenges that families encounter. Surprisingly, parent involvement in school did not associate with family attendance, although the family expectation of school success is evident as the Personal Value on Achievement Scale clustered with scales pertaining to the quality of parent-child interaction, which did influence program participation (negatively).

DISCUSSION

Utilizing both a demographic schema and a variable clustering procedure, a number of significant associations with attendance suggests that family program leaders and

school staff have the opportunity to assess potential family participation success and construct effective recruitment strategies by targeting their efforts toward families with certain characteristics. The results of the current study suggest that a variety of demographic, attitudinal, and behavioral characteristics can be influential predictors of participation in a family-based school program.

In the first analysis, education was positively associated and family structure (single-parent households) was negatively associated with attendance. A positive relationship between parent's education level and attendance suggests that parents with more education tend to view family education programs as an opportunity to promote a successful academic experience for their children. Noting that the sample consists of families with children identified by their teachers as being aggressive and influential, it could be that those parents with greater education view the educational system more favorably due to their own success in school earlier in their lives and, thus, are more comfortable in schools and participating in school-related activities. Parents with more education may also view education as the mechanism for career or life success. Thus, parents who have obtained a greater level of education who receive notice from the school that their child has been nominated for an intervention program due to aggressive behavior may trigger a "level of alert" that is not as likely to occur with parents who obtained less education. Because this finding appears consistently across analyses, school staff and family group recruiters may wish to target recruitment efforts disproportionately to families in which parents have less education if the staff strives to obtain greater involvement from them. Given that dinner, a small stipend, child care, and help with transportation were offered to all families, the challenge to recruit families of parents with less formal education appears to be formidable; however, a school procedure that identifies parents with less formal education and a strategy to utilize school resources available to target these parents might be advisable. Given that there is almost a two session difference on attendance between single-parent and two-parent families, a school might justify differential strategies and allocation of resources across families being recruited given that single-parent families are often in most need of support due to more limited parental resources and a greater burden to fulfill life tasks.

A negative association with family attendance was found for the variable cluster of child aggression. This result might initially serve to focus the attention of family interventionists and school staff and guide their strategies to apply more resources to recruitment efforts of these families. More serious aggressive behaviors may require more intensive recruitment strategies. It is also noteworthy that this variable cluster includes relational aggression as well as physical aggression, suggesting that recruitment of families with children reporting high relational aggression should not be overlooked. Families with children exhibiting relational aggression as compared to physical aggression may not be as likely to understand how a program for aggressive children would be appropriate for them.

The parent-child bond variable cluster relates to level of family attendance. Family cohesion, combined with the characteristic of high leadership traits of students and the parent's view of the importance of achievement, are associated with families who are less likely to attend family programs. What might be operating in a family's decision to attend family-based program at the school? It could be that parents confuse some aggressive behaviors as leadership skills, and thus, do not view their child in need of a family program that addresses aggressive behavior. It may be that parents view their children's leadership skills as a skill set that they can utilize to resolve their own

conflicts with other students or teachers; thus, not seeing value in a family program sponsored by a school. Or, students with strong leadership skills, combined with strong family bonds, may not fully appreciate the utility of seeking help from others. Another possibility is that some parents view high family cohesion and positive parenting and involvement with their children as a sufficient resource that buffers their concerns and permits them to extricate themselves from the teacher's view of their child as aggressive. Such family characteristics may serve to mitigate the aggressive behaviors reported about their children independently of any school-sponsored program. The challenge for a school or staff of a school sponsored family-based program for aggressive students in bolstering attendance of families with strong parent-child bonds is formidable, and, thus, requires greater attention.

It may be noteworthy that the variable cluster of child aggression is formed from the student reports of aggressive behaviors within the last 30 days; whereas the variable cluster of parent-child bond is shaped from the parent rating of family processes such as cohesion, positive parenting, and monitoring. In both cases, there is a negative relationship with family attendance, suggesting that an understanding of the student and family by the school to determine the level of challenges it must address in successfully convening families in a school program needs to include a familiarity with both the student and parent. Students who self-reported aggressive events within the last 30 days and parents who viewed their family life more favorably were in this study the most difficult to successfully convene in school programs.

In the LMM model, the variable cluster of child (overt and relational) victimization of students is associated with more frequent attendance at family programs. Parents who are aware of this victimization of their children may view this circumstance with a greater sense of urgency and, thus, have greater motivation for seeking professional or school support. These parents, possibly with the urging of their children who are being victimized, may react immediately to a request from a school to participate in a family program for aggressive students because of the protective function that the family enacts. In this instance, it may be important for school personnel or family group recruitment staff to be optimistic about successful recruitment of families of students who are victimized in the school setting. That overt and relational victimization of students can likely result in their participation in a school program if offered should encourage school staffs to engage in the recruitment of these families actively, although disproportionate resource allocation for these families may be unnecessary.

The LMM identified differences among the interventionists as a small component of the total variance in sessions attended. That interventionist was a contributing factor in family attendance confirms the important role that group leaders have in producing a higher level of participation in family intervention programs. The small contribution that this factor made in attendance might be the result of the measure, in which the style, enthusiasm, and experience levels of the group leaders were not assessed. Data drawn from family reports of the group leader were not utilized due to the methodology employed in the study. Substantial reductions in data from families would have resulted from drawing on family reports across the length of the program as the dropout rate increased. Yet, the finding that the variable "interventionist" influenced attendance suggests that this source of data is important in studies on family attendance. Further examination of the competencies of the group leader and their possible effects on family participation is warranted.

Because the variable clusters of parent life stress and depression were not related to family attendance, professionals who recruit families to school

programs must construct creative recruitment strategies that transcend the common notion that stress and/or depression necessarily impedes attendance by single parents. Because neither parent life stressors nor parent depression emerged as predicting attendance, the professional cannot be quick to assume that parents simply have too many burdens or personal difficulties to participate in a family-based school program. Some other mechanism(s) must be operating in families to explain their lower attendance. Other forces that deter attendance may be more salient. For example, job responsibilities may conflict with the schedule of the family program, despite it being offered in the evening, suggesting that school staff and group leaders must adequately survey families to determine the best times and place to offer a family program. The measure of life stress used may not have tapped into some possible sources of burden. Parents may have more daily household demands that deter their regular participation that are not indicated in the measure on life stressors.

One implication of this analysis on family participation in a school-based program is that it is possible for schools to successfully recruit and retain families of aggressive children. The Cohort 2 data, in particular, suggest that once a family-based program becomes operational in a school, the level of participation is moderately high. In the first 2 years of the inception of a family-based program at middle schools in four sites, almost half (48.6%) agreed to participate and attended the majority (11–15) of the family sessions. Fewer than one out of four (23.3%) who agreed to attend the program did not participate in a single session. Given that the family participation rates were substantially higher for Cohort 2 (9.42 sessions) as compared to Cohort 1 (6.80 sessions), one could speculate that a family-based program would be well attended with the appropriate incentives and protocols established, and that these attendance rates would increase as the program became an ongoing yearly school intervention program for highly aggressive students and their families.

That certain variable clusters such as life stresses on parents, parent involvement in school-related matters, family beliefs about themselves and discipline styles, parental views of their child's behavior problems, and parental depression did not predict attendance across analyses, and may not influence the level of family attendance as much as some other factors, may be a counter-intuitive finding in many school communities. Schools and human service professionals may need to exert caution in assuming prematurely who will attend a family-based program. Justifications for schools choosing not to offer family-based programs due to racial or ethnic composition of the student population, majority presence of low-income families, or life burdens of the parents, appear unwarranted based on these results. Even though single-parent families attended fewer sessions (7.61) than two-parent families (9.39) or single-parent families with another adult in the household, such as grandparents (8.13), these data suggest that the attendance of single-parent families with no other adult in the household at family-based programs for helping their aggressive children can succeed. Many single-parent families did attend and developed regular attendance habits as evidenced by single parents averaging one-half (7.61 of 15) of the family sessions offered. Thus, if school personnel and family interventionists developed stronger relationships with single parents, as well as adults in all family structures, via home visits and incentives such as childcare and meals, and include program content on strengthening parent involvement with the child about educational-related themes and parent and family skill-building, family-based school programs for aggressive students can be established.

REFERENCES

- August, G.J., Egan, E.A., Realmuto, G.M., & Hektner, J.M. (2003). Parceling component effects of a multifaceted prevention program for disruptive elementary school children. *Journal of Abnormal Child Psychology*, 31, 515–527.
- August, G.J., Realmuto, G.M., Hektner, J.M., & Bloomquist, M.L. (2001). An integrated components preventive intervention for aggressive elementary school children: The Early Risers Program. *Journal of Consulting and Clinical Psychology*, 69, 614–626.
- Beauchaine, T.P., Webster-Stratton, C., & Reid, M.J. (2005). Mediators, moderators, and predictors of 1-year outcomes among children treated for early-onset conduct problems: A latent growth curve analysis. *Journal of Counseling and Clinical Psychology*, 73, 371–388.
- Becker, D., Hogue, A., & Liddle, H.A. (2002). Methods of engagement in family-based preventive intervention. *Child and Adolescent Social Work Journal*, 19, 163–179.
- Conduct Problems Prevention Research Group. (1998). Technical reports for the Fast Track assessment battery. Unpublished technical reports.
- Crick, N.R., & Bigbee, M.A. (1998). Relational and overt forms of peer victimization: A multi-informant approach. *Journal of Consulting and Clinical Psychology*, 66, 337–347.
- Diamond, G.S., Liddle, H.A., Hogue, A., & Dakof, G.A. (1999). Alliance-building interventions with adolescents in family therapy: A process study. *Psychotherapy*, 36, 355–368.
- Dishion, T.J., & Kavanagh, K. (2003). *Intervening in adolescent problem behavior: A family-centered approach*. New York: Guilford Press.
- Farrell, A.D., Kung, E.M., White, K.S., & Valois, R. (2000). The structure of self-reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology*, 29, 282–292.
- Gorman-Smith, D., Tolan, P.H., Henry, D.B., Leventhal, A., Schoeny, M., Lutovsky, K., et al. (2002). Predictors of participation in a family-focused preventive intervention for substance use. *Psychology of Addictive Behaviors*, 16, 55–64.
- Gorman-Smith, D., Tolan, P.H., Zelli, A., & Huesmann, L.R. (1996). The relation of family functioning to violence among inner-city minority youth. *Journal of Family Psychology*, 10, 101–116.
- Henry, D.B., Miller-Johnson, S., Simon, T.R., Schoeny, M.E., & The Multi-site Violence Prevention Project. (2006). Validity of teacher ratings in selecting influential aggressive adolescents for a targeted preventive intervention. *Prevention Science*, 7, 31–41.
- Hogue, A., Johnson-Leckrone, J., & Liddle, H.A. (1999). Recruiting high-risk families into family-based prevention and prevention research. *Journal of Mental Health Counseling*, 21, 337–351.
- Hubble, M.A., Duncan, B.L., & Miller, S.D. (1999). *The heart and soul of change: What works in therapy*. Washington, DC: American Psychological Association.
- Kamphaus, R.W., Petoskey, M.D., Cody, A.H., Rowe, E.W., Huberty, C.J., & Reynolds, C.R. (1999). A typology of parent-rated child behavior for a national U.S. sample. *Journal of Child Psychology and Psychiatry*, 40, 1–10.
- McLean, R.A., Sanders, W.L., & Stroup, W.W. (1991). A unified approach to mixed linear models. *The American Statistician*, 45, 54–64.
- Miller-Johnson, S., Sullivan, T.N., Simon, R.R., & The MVPP. (2004). Evaluating the impact of interventions in the Multisite Violence Prevention Project: Samples, procedures, and measures. *American Journal of Preventive Health*, 26, 48–61.
- Multisite Violence Prevention Project. (2004). *American Journal of Preventive Medicine*, 26, 3–11.

- Multisite Violence Prevention Project. (2008). The Multisite Violence Prevention Project: Impact of a universal school-based violence prevention program on social-cognitive outcomes. *Prevention Science*, 9, 231–244.
- Multisite Violence Prevention Project. (2009). The ecological effects of universal and selective violence prevention programs for middle school students: A randomized trial. *Journal of Consulting and Clinical Psychology*, 77, 526–542.
- Orpinas, P., & Frankowski, R. (2001). The aggression scale: A self-report measure of aggressive behavior for young adolescents. *Journal of Early Adolescence*, 21, 51–68.
- Prinz, R.J., Smith, E.P., Dumas, J.E., Laughlin, J.E., White, D.W., & Barron, R. (2001). Recruitment and retention of participants in prevention trials involving family-based interventions. *American Journal of Preventive Medicine*, 20, 31–37.
- Quinn, W.H. (2004). Family solutions for at-risk youth: Applications to juvenile delinquency, truancy, and behavior problems. New York: Brunner-Routledge.
- Quinn, W.H., Dotson, D., & Jordan, K. (1997). Dimensions of therapeutic alliance and their associations with outcome in family therapy. *Psychotherapy Research*, 7, 429–438.
- Quinn, W.H., & VanDyke, D.J. (2004). A multiple family group intervention for first-time juvenile offenders: Comparisons with probation and dropouts on recidivism. *Journal of Community Psychology*, 32, 1–24.
- Radloff, L.S. (1977). The CES-D Scale: A self-report depression scale for research in a general population. *Applied Psychological Measures*, 1, 385–401.
- Reynolds, C.R., & Kamphaus, R.W. (1992). Behavior Assessment System for Children. Circle Pines, MN: American Guidance Service, Inc.
- Robbins, M.S., Liddle, H.A., Turner, C.W., Dakof, G.A., Alexander, J.F., & Kogan, S.M. (2006). Adolescent and parent therapeutic alliances as predictors of dropout I multidimensional family therapy. *Journal of Family Psychology*, 20, 108–116.
- Smith, E.P., Gorman-Smith, D., Quinn, W.H., Rabiner, D.L., Tolan, P.H., Winn, D., & The Multisite Violence Prevention Project. (2004). Community-based multiple family groups to prevent and reduce violent and aggressive behavior: The GREAT Families Program. *American Journal of Preventive Medicine*, 26, 39–47.
- Spoth, R., Clair, S., Greenberg, M., Redmond, C., & Shin, C. (2007). Toward a dissemination of evidence-based family interventions: Maintenance of community-based partnership recruitment results and associated factors. *Journal of Family Psychology*, 21, 137–146.
- Spoth, R., & Redmond, C. (1992). Research on family engagement in preventative interventions: Toward improved use of scientific findings in primary prevention practice. *Journal of Primary Prevention*, 21, 267–284.
- Spoth, R., & Redmond, C. (1995). Parent motivation to enroll in parenting skills programs: A model of family context and health belief predictors. *Journal of Family Psychology*, 9, 294–310.