

Family Involvement with Children's Homework: An Intervention in the Middle Grades.

By: Balli, Sandra J., Demo, David H., and Wedman, John F.

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Abstract:

This study investigated a middle-grades mathematics homework intervention designed to increase family involvement in homework. The participants were 74 sixth-grade students and their families from a midwestern school. The students were enrolled in one of three mathematics classes taught by the same instructor. In one class there were no homework involvement prompts, in the second class students were prompted to involve family members, and in a third class students were prompted to involve family members and family participation was requested directly. Findings indicate that, compared to families that were not prompted, families in the two classes receiving prompts were significantly more involved in mathematics homework activities. However, level of family involvement did not predict student achievement. Implications for practice and directions for research are discussed.

Key Words:

children's homework, family involvement, intervention.

Article:

Most educators agree that children do better in school when parents are involved. Types of involvement vary widely and include attending a parent-teacher conference, volunteering at school, helping with homework, or simply encouraging student achievement. Many studies link parent involvement with a range of positive student outcomes, including higher academic achievement, improved school attendance, increased cooperative behavior, enhanced school retention and lower dropout rates (Ekstrom, Goertz, Pollack, & Rock, 1986; Epstein, 1992; Greenwood & Hickman, 1991; McDill & Rigsby, 1973; Sui-Chu & Willms, 1996). More broadly, parental engagement in children's homework is an example of the most direct, face-to-face form of parental involvement in children's lives, communicating affection, nurturance, and support for children and facilitating their overall sense of well-being (Acock & Demo, 1994; Lamb, Pleck, Chernov, & Levine, 1987; LaRossa, 1988). Yet very little research has examined the role teachers play in facilitating parent involvement (Eccles & Harold, 1996). There is also evidence that teachers want more contact with parents and that parents want more communication with and information from teachers (Eccles & Harold, 1996). As such, teachers play a vital role as family professionals, although they probably have little training or guidance on how to work with families. Further, despite increasingly diverse family living arrangements, the nearly exclusive focus of previous research has been on parent involvement in school-related activities, rather than family involvement, ignoring the possible involvement of other resident and nonresident family members. In this paper we describe and assess an intervention designed to increase family involvement in children's homework, and we discuss implications for teachers, parent educators, and researchers.

Overview of Parent Involvement Research

Contemporary efforts to involve parents are rooted in Project Head Start. The purpose of Head Start is to help children transcend the limitations of poverty and receive an intellectual foundation for school (Slaughter &

Kuehne, 1988). According to Shriver (1979), Head Start research demonstrated the positive impact of the program and set the stage for parent involvement.

The widespread view among educators that parent involvement contributes to successful student outcomes has led many educators to encourage parents to be involved in learning activities at home. For example, Epstein (1987) found that students whose teachers were "frequent users" of parent involvement at home showed the highest gains in reading achievement between fall and spring achievement test scores. Yet research is scarce on parent involvement with middle-grades homework (J. L. Epstein, personal communication, September 7, 1994; Henderson, Marburger, & Ooms, 1986). A review of articles published in education journals yielded 46 studies specifically related to the effects on student achievement of parent involvement in school-related activities. Only two of the studies concerned middle-grades homework. One study, based on the National Education Longitudinal Study of 1988 and involving survey data gathered from nearly 22,000 eighth graders and their parents, suggested that parent involvement had a substantial effect on eighth graders' achievement test scores. The effect seemed to be accomplished primarily through parent involvement with homework, which led to higher homework completion (Keith, 1992). However, a survey of 560 fifth-grade parents indicated that most parents had problems establishing homework routines with their children and that family schedules often interfere with consistent homework monitoring (Reetz, 1991).

Implementing parent involvement activities implies that some type of communication (e.g., prompting) will take place to get parents involved in the activity. The current study employs various forms of communication (i.e., no prompts, student prompts, or student and family prompts) to determine the influence of such prompts on reported levels of family involvement with mathematics homework. Specifically, we examine family involvement with homework under three conditions: (1) when no prompts are used to involve family members; (2) when students are prompted to involve family members; and (3) when both students and family members are prompted to involve family members in homework. We also examine the relationship between family involvement with homework and student achievement on a mathematics post-test, and we explore characteristics of families (i.e., parent education level, family structure, and family size) that may influence family involvement and student achievement.

Theoretical Perspectives

The family and the educational system are the two major institutions responsible for socializing and educating children, as children spend the majority of their developmental years immersed within these two institutions. Two theoretical perspectives that are helpful in conceptualizing the influence and interface of these two institutions are Bronfenbrenner's (1979; 1989) ecological model of nested connections, and Epstein's (1992) model of overlapping spheres of influence.

Bronfenbrenner emphasized that human development must be studied in actual life settings, with each context consisting of a microsystem, mesosystem, exosystem, and macrosystem. The most immediate systems influencing the individual are the microsystem, consisting of patterned face-to-face interactions (e.g., parent-child), and the mesosystem, defined as the linkages among microsystems (e.g., family and school). Bronfenbrenner (1979) asserted that the manner in which the environment is experienced and perceived, or its phenomenological meaning, is critical, and that environmental influences (activities, roles, and relationships) acquire greater meaning to the degree that they are experienced and perceived similarly across multiple contexts. Thus, the most important feature of his model for the current study is that it emphasizes the interrelationships among subsystems, such as the communication between teachers and parents. Bretherton (1993) notes that one of the central tenets of Bronfenbrenner's theory is the hypothesis that "the developmental potential of a specific setting is enhanced when there are many supportive links (shared goals, mutual trust, positive orientation, and consensus) between settings, so that both can function as a harmonious network" (p. 286).

Similarly, Epstein's (1992) model of overlapping spheres of influence emphasizes the combined influence of the family and educational institutions on the lives of children. Although the two systems sometimes operate as

separate spheres of influence, each with its own beliefs and practices, at other times the separate spheres can be linked together to create an area of overlap. This model recognizes that educational systems and families conduct many activities separately, but they conduct some activities jointly. Homework can be an example of a joint activity in that teachers develop and grade homework assignments, students are expected to complete them, and parents or other family members may need to monitor, discuss, or help with the assignments.

The model also directs attention to reciprocal influences among teachers, children, and families. Although research and theory have focused almost exclusively on the powerful influence of parents and teachers in children's development and wellbeing, children are active agents in their own education and in the lives of their parents and teachers. For example, teachers may solicit family involvement indirectly through prompting children, or they may directly prompt family members to become more involved. Children, in turn, can request family involvement with (or without) the influence of teacher prompting. Families may become involved with homework on their own or because their child or their child's teacher has influenced them to become involved. Children's academic performance is also important, as parents of high-achieving students may feel less need to monitor and assist in homework than parents of average or below-average students. Of course, with or without prompts, competing influences (e.g., time constraints) may interfere with family involvement with homework.

Indeed, both Epstein's and Bronfenbrenner's models predict that communication and shared goals between parents and teachers should lead to successful student outcomes. Students may hear from both teachers and families that education is important and they may observe that caring people in both spheres are investing time and resources to help them succeed academically.

Family Characteristics, Family Involvement, and Student Achievement

Parents' socioeconomic status. Studies indicate that parents' socioeconomic status (SES) is associated with parent involvement in homework (Revicki, 1981) and student achievement (Acock & Demo, 1994; Coleman et al., 1966; Dornbusch, 1986; Kinard & Reinherz, 1986). Dornbusch (1986) analyzed survey data from 8,000 high school students and found that the most important family background variable in predicting student achievement is parents' education. Revicki (1981) studied a sample of 321 second-grade children and found that the higher the family income the more likely parents were to volunteer in the classroom and attend parent-teacher conferences. Higher income was also associated with higher student achievement on standardized tests.

Family structure. Several studies indicate that biological parents in two-parent households spend more time than other parents engaged with children in homework activities. Astone and McLanahan (1991) analyzed data from the High School and Beyond study and found that, compared to children who live with both biological parents, those who live with single parents or stepparents report less monitoring of schoolwork by both mothers and fathers. Using the National Survey of Families and Households, Acock and Demo (1994) found no significant differences in mothers' involvement in homework across families where mothers are continuously single, first-married, divorced, or remarried. But fathers' involvement was higher in first married families than in stepfather families, and academic performance was somewhat higher among adolescents in first-married families. Similarly, Furstenberg and Nord (1985) reported that parents in first-married two-parent families were much more likely to help with homework than were parents in step-families or single-parent families.

Family size. Another indication that time constraints may influence parent involvement is offered by Revicki (1981), who found that the greater the number of children in a family the less likely parents were to be involved in each child's education. Likewise, Blake (1989) argued that larger family size tends to dilute resources among many children and that children who have no siblings generally do better in school than children who have one or more siblings.

Research Questions

Four research questions were investigated in this study:

(1) What is the relationship between differential prompts (i.e., no prompts, student prompts, and student and family prompts) and reported levels of family involvement with mathematics homework?

(2) Is there a difference between reported levels of family involvement with mathematics homework and reported levels of family involvement with other homework assignments? Is the difference related to the prompts?

(3) What is the relationship between reported levels of family involvement with mathematics homework and student achievement on a mathematics posttest?

(4) Is there a relationship among reported levels of family involvement with mathematics homework, student achievement, and selected family variables including parent education level, family structure, and family size?

METHOD

Sample

Participants were 74 Caucasian sixth graders (31 boys and 43 girls) and their predominantly middle-class families. The school principal did not have (and did not allow us to collect) data on family income, but a sizable portion of the sample was working-class. For 40 of the 74 families, neither parent had a 4-year college degree, while in 34 families at least one parent had a 4-year college degree. Class 1 included 26 students (14 girls and 12 boys), class 2 consisted of 25 students (15 girls and 10 boys), and class 3 enrolled 23 students (14 girls and 9 boys).

Students were enrolled in one of three middle-grades mathematics classes taught by the same teacher. The school principal was interviewed prior to the study and indicated that students were enrolled in the three classes based on a similar range of academic ability and a similar range of family backgrounds. We also assessed prior mathematics achievement using the Missouri Mastery and Achievement Test (MMAT) and found the 3 groups to be nearly identical. An analysis of variance confirmed the groups were equivalent in prior mathematics achievement [$F(2,71) = .001, p = .99$].

Each mathematics class met every school day. The three intact mathematics classes were randomly assigned to one of the following three groups: the first class (Group 1) was given no prompts to involve family members; students in the second class (Group 2) were prompted to involve family members; and for the third class (Group 3), students were prompted to involve family members and family members were prompted to be involved.

Homework Assignments

The homework intervention consisted of 20 mathematics homework assignments developed by Epstein (1988) as part of a program called "Teachers Involve Parents in Schoolwork" (TIPS). The TIPS homework assignments require students to interact with a family member in order to complete the assignment. Students gather information, explain, demonstrate, and guide the interactions. The 20 assignments covered the following basic mathematics concepts: number concepts, whole number operations, mixed number/fraction operations, decimal operations, measurement, using data, and integers.

Each homework assignment was printed on one sheet of colored paper (front and back) and included three sections: (1) instruction on the skill to be learned; (2) examples of skills with sample problems to be solved; and (3) practice with application activities. As described below, the 20 assignments were altered to adapt to the following three levels of prompts:

No prompts: There was nothing printed on the assignments to prompt family involvement with the assignments.

Student prompts: These assignments prompted students with directions on how to involve a family member.

Student and family prompts: Designed by Epstein (1988), these assignments prompted students to involve a family member, prompted families to offer written comments on a feedback section, and requested a parent signature on the assignment sheet.

Introductory Letter to Parents

Introductory letters to inform parents about the homework assignments were constructed to correspond to the three levels of prompting. The "no prompt letter" informed parents about the mathematics concepts used in the assignments. The "student prompt letter" added a paragraph about the students' responsibility for involving a family member. The "student and family prompt letter" included an additional paragraph requesting family feedback on the assignments and a parent signature on each assignment sheet. The letters were sent to parents to correspond with their child's homework group. Letters were mailed the week prior to the start of mathematics homework assignment distribution.

Homework Survey

A homework survey consisting of 10 questions was constructed to assess family involvement with mathematics homework and with other homework assignments. Four questions measured family involvement with mathematics homework ($\alpha = .86$), four parallel questions measured family involvement with other homework ($\alpha = .71$), and two questions asked if family members would be more likely to help with homework if they were asked by their child or their child's teacher. A representative item measuring family involvement with math homework is: "My child discussed the yellow math homework sheets with me (or another family member)." A 5-point Likert scale was used with a response of "5" indicating "always" and a response of "1" indicating "never."

Distribution of Homework Assignments

The sixth-grade mathematics teacher distributed the 20 homework assignments for three months during the second semester of the 1994-95 school year. Assignments were distributed at the teacher's discretion to correspond with the curriculum until all 20 assignments were completed. After distributing a homework assignment, the teacher reviewed the assignment and explained the directions. Students in the first class (Group 1) were told to complete the problems but given no prompts to involve family members. Students in the second class (Group 2) were told to complete the problems and were prompted to involve a family member as directed on the assignment sheet. Students in the third class (Group 3) were told to complete the problems, prompted to involve a family member as directed on the assignment sheet, and alerted to the feedback section which prompted families to provide written feedback and sign the assignment sheet. The directions were reviewed and prompting was given each time an assignment was distributed. Each student completed all 20 homework assignments (100% return rate--1480 total assignments).

Students Surveyed

Students in all three groups were surveyed to determine if their families had been helping them with mathematics homework. (This is the only way we could find out from Group 1 students if their families helped, because they were not asked "who helped" on the assignment sheets as the two prompted groups were.) The students were given a 3-question survey at the end of the first month and again three weeks later. On each survey, students were asked if a family member had helped them with mathematics homework. Two distracter questions were included on each survey so that Group 1 students (i.e., the no prompt group) might be less likely to assume that family involvement with mathematics homework was expected (Groups 2 and 3 knew family involvement was expected). An example of a distracter question is: "I usually do homework (1) right after school, (2) after supper, or (3) before I go to bed."

Administration of Mathematics Posttest

After the 20 homework assignments were completed, students were given a 40-item posttest. A mathematics educator evaluated the content validity of the posttest. Reliability was assessed using the Kuder-Richardson formula 20 (Hopkins, Stanley, & Hopkins, 1990), resulting in a .90 reliability coefficient. A prior mathematics achievement score on the Missouri Mastery and Achievement Test (MMAT) was obtained for each student

from school records. This score was used as a covariate to control for variability in the posttest scores that was attributable to prior achievement.

Hypotheses and Analyses

Hypothesis 1: There should be higher levels of family involvement with mathematics homework in Group 2 (which included student prompts) than Group 1 (which included no involvement prompts). Similarly, there should be higher family involvement in Group 3 (which included both student and family prompts) than for Groups 1 or 2.

Hypothesis 2: Because the involvement prompts were used only for mathematics homework, Groups 2 and 3 (the only prompted groups) should report significantly higher levels of family involvement with mathematics homework than with other homework. Because Group 1 received no involvement prompts, it is predicted there will be no significant difference between family involvement with mathematics homework and family involvement with other homework for Group 1.

Hypothesis 3: Students in Group 2 should score significantly higher on the posttest than students in Group 1. Further, students in Group 3 should score significantly higher on the posttest than students in Groups 1 or 2.

Hypotheses 4a-4c: Consistent with indications from previous research, it was predicted that:

(a) students whose parent(s) held a 4-year college degree would experience significantly higher levels of family involvement with mathematics homework and significantly higher student achievement than would students whose parents do not hold a college degree;

(b) students who live in two-parent households would experience significantly higher levels of family involvement with mathematics homework and significantly higher student achievement than students who live in single-parent households; and

(c) students who have no siblings or one sibling would experience significantly higher levels of family involvement with mathematics homework and significantly higher student achievement than students who have two or more siblings.

Written Comments and Telephone Interviews

A content analysis was conducted on Group 3 written comments. (Families in Groups 1 and 2 were not prompted to write comments on the assignments.) In addition, family members who were willing to discuss their involvement with homework were asked to provide their telephone numbers on the follow-up survey. Although the interview questions varied among participants (to allow for probing), interviewees were generally asked to discuss three issues: (1) the best and worst parts about helping with homework, (2) the challenges they faced in helping with homework, and (3) their opinions about workshops to help family members understand concepts associated with homework topics. Interviews normally lasted about 10 minutes and the researcher took notes during the interviews. The notes were examined for patterns and connections that could be called common themes (Seidman, 1991).

RESULTS

Student reports of family involvement recorded on each homework assignment were tabulated for Groups 2 and 3 (Group 1 assignments did not request student reports of family involvement). According to student reports, 90.6% of family involvement with mathematics homework was parent involvement and 9.4% was involvement with other family members including grandparents, brothers, and sisters. Parental involvement consisted of mothers helping with 61.7% of the assignments, fathers assisting with 26.1% of the assignments, and mothers and fathers both helping with 2.8% of assignments.

Another way to examine family involvement is to assess whether individual students worked with the same family member for each of the 20 assignments, or if different family members were involved for different assignments. Over the span of the study, every student worked with at least two different family members (and every student worked with each parent for at least one assignment), and 87% of students worked with someone other than a parent for at least one of the assignments.

The first research question examined the effects of differential prompts on reported levels of family involvement with mathematics homework. Table 1 shows the mean levels of family involvement with mathematics homework (as reported by parents) for each of the three groups. An ANOVA was used to compare the three groups and was statistically significant. Scheffe's post hoc test was then applied to individual group means. As hypothesized, groups 2 and 3 were both significantly more involved with mathematics homework than was Group 1. There was no significant difference in reported family involvement between Groups 2 and 3, refuting the hypothesis that Group 3 would have the highest level of reported family involvement.

Students' reports on homework assignments suggested otherwise, however. According to student records, family members were much more involved with homework for students in Group 3 (family involvement reported for 90% of the assignments) than for students in Group 2 (family involvement for 51% of the assignments). In sum, the evidence bearing on the first hypothesis shows clearly that family involvement was greater for Group 2 than for Group 1, but there's mixed evidence regarding differences in family involvement between Groups 2 and 3.

The second research question examined family-reported levels of involvement with mathematics homework compared to levels of involvement with other homework. The data presented in Table 2 show that although groups 2 and 3 reported more involvement with mathematics homework than other homework, there were no statistically significant differences. However, a two factor (i.e., groups, homework types) ANOVA with repeated measures on the second factor was conducted to determine if there was an interaction between the three groups and the two homework types (i.e., mathematics homework, other homework) in their influence on family involvement. The interaction was significant [$F(2,66) = 8.92, p < .011$].

Because there was a significant interaction between the three groups and the two homework types, each group was examined for within group differences. As hypothesized, Groups 2 and 3 reported significantly more family involvement with mathematics homework than with other homework [Group 2: $F(1,21) = 11.39, p < .01$; Group 3: $F(1,21) = 8.61, p < .01$]. Group 1 (the unprompted class) reported significantly more family involvement with other homework than with mathematics homework [$F(1,24) = 7.61, p < .05$]. Although there is the possibility that the interaction in Table 2 would not have been statistically significant had the parents in the control group (Group 1) been as involved in their children's math homework as they were in their children's other homework, we have no reason to suspect the teacher did anything to discourage parental involvement with math homework for this group. In fact, the first author met with the teacher four times prior to the study, and weekly during the study, to remind her not to encourage or discourage family involvement for Group 1.

We also sought to determine if differences in family involvement were attributable, at least in part, to prompts. Two questions on the follow-up survey concerned the reported likelihood that families would be involved with homework if their child's teacher prompted them to be involved and if their child prompted them to be involved. Families across all three groups reported they would more likely be involved with homework if their child or their child's teacher prompted them to be involved than if they were not prompted. Further, all three groups reported a slightly higher likelihood of being involved with homework if their child prompted them than if only their child's teacher prompted them to be involved.

The third research question examined the effects of family involvement on student achievement on a mathematics posttest. To determine the effects of family involvement on posttest achievement, it was necessary to establish mathematical equivalence among the three groups. As indicated above, prior mathematics achievement was compared using mean scores on the most recently administered standardized achievement test.

An ANOVA was performed to compare mean mathematics scores on the MMAT among the three groups, and the results indicated that the groups were equivalent. Correlations between the posttest scores and the prior achievement score were strong and positive for each group (ranging from .66 to .88), suggesting that prior achievement was an appropriate covariate to use when comparing posttest means. However, an ANCOVA indicated no significant differences on the posttest among the three groups [$F(2,70) = .15$]. Thus, the third hypothesis was not supported.

In addition to the posttest, mean scores on the 20 mathematics homework assignments were examined for differences among the three groups. The student and family prompt group had the highest average homework scores (81.8%), followed by the student prompt group (79.3%). The group that received no prompts had the lowest average homework scores (75.5%). While this shows a pattern in the hypothesized direction, the differences were not large, and due to the small sample size, they were not statistically significant.

The fourth research question examined relationships among selected family variables, family involvement, and student achievement. The entire sample was divided into two groups based on whether or not their parent(s) held a 4-year college degree. As hypothesized, data presented in Table 3 show that students whose parent(s) held a college degree did significantly better on the posttest than students whose parents did not hold a college degree. However, there was no significant difference in mean levels of reported family involvement based on parent education level.

To examine family structure, students were divided into two groups based on whether they lived with two parents or with one parent. There was no significant difference in student achievement based on family structure, but two-parent families reported significantly more involvement with mathematics homework than did single-parent families (see Table 4). In addition, students were divided into three groups according to family size (i.e., students having no siblings, one sibling, or two or more siblings). There were no significant differences in student achievement or reported levels of family involvement based on family size.

Finally, a series of multivariate analyses were conducted to assess the influence of the prompts and selected demographic variables on family involvement with mathematics homework. Because inclusion in a particular group (i.e., one of the two experimental groups) predicted higher levels of family involvement, an analysis of covariance was used to separate the contribution of group membership from that of the demographic variables. Group membership was regressed on family involvement, indicating that this variable alone accounted for 20% of the variance in family involvement. The residual from this analysis was then entered in a second regression. The demographic variables were regressed on the residual and explained 23% of the variance in family involvement (see Table 5). Having two parents in the household significantly predicted family involvement, but parents' education and family size (number of siblings) were unrelated to family involvement.

Similar analyses were conducted to assess the influence of demographic variables and prior mathematics achievement in predicting posttest achievement scores. Because prior mathematics achievement was significantly correlated with posttest achievement, an analysis of covariance was used to disentangle the contribution of prior achievement from that of demographic characteristics in predicting posttest achievement. Prior achievement alone accounted for 55% of the variance in posttest achievement. The residual from this analysis was then entered in another regression equation (Table 6). The demographic variables were regressed on the residual and explained 15% of the variance in posttest achievement. Parents' education and having two parents present in the household were positively related to achievement, but family size (number of siblings) was unrelated. It is worth reiterating that the very strong correlations between prior achievement and posttest scores compromised the power of the covariance analysis. In fact, when we examined the effect sizes, the difference in posttest achievement between the control group and the two experimental groups would have needed to be at least 3 times larger to demonstrate a small change. Thus, although the intervention significantly increased family involvement (as shown above), the increases in children's achievement directly attributable to family involvement were not powerful enough to be statistically significant.

Written Comments

One of the groups (Group 3) included family prompts to write comments about the mathematics homework assignments. In all, 70 comments were made by 17 families. Mothers made 38 comments; fathers made 24 comments; and 8 comments were made by other family members (e.g., grandparent, sister, brother).

Sixty-eight comments were classified into five categories. The largest category, "Enjoyed the homework activity" (n = 22), consisted of positive comments about working with the student or the perceived benefits of the activity. For example, one father commented, "Fun--I think my daughter can open her own business now." A mother wrote, "Jeffrey understands these concepts. It was fun doing them with him."

A second theme that emerged from family members' written comments involved a specific section of the assignments. Thirteen family members wrote that they "Liked the 'real world' section" of each assignment. This section involved activities that applied concepts to real life situations and asked the student to interact with a family member on an activity. For example, one activity involved looking at a newspaper stock market report to make decisions about buying stocks. One mother commented, "I loved the stock market questions." Another "real world" activity asked families to design a simple toy including at least three parts. The activity utilized the concepts of cost and profit. One mother commented on the toy she and her daughter designed, "We would like to sell lots of the wind-up cars. Yeah! Money! Profit!"

Three categories concerned difficulties encountered with the assignments: "Difficult for family member" (n = 10), "Difficult for student" (n = 9), or "Difficult 'real world' application" (n = 4). Several comments indicated some frustration, but implied that the parents were indeed working with their children on the problems. For example, one mother wrote, "I don't think Jim understands the concept of measures of central tendency, and he would not let me explain." A father commented, "I became frustrated at times because my child was looking for quick, easy answers instead of thinking through the problem."

Follow-up Interviews

To better understand family dynamics associated with the intervention, verbal comments from family members in all three groups were elicited in follow-up interviews. Twenty-nine families (from the 74 participating) agreed to be interviewed by indicating their telephone number on the homework survey. From this group, 24 were subsequently contacted by telephone. Interviewees represented various educational backgrounds, family sizes and structures, and reported levels of family involvement with mathematics homework; their children represented a wide range of ability levels in mathematics. Notes taken during the interviews were examined for patterns and connections that could be called common themes (Seidman, 1991). Three themes emerged.

The first theme emerged in response to a question about the challenges associated with helping children with homework. Sixteen of the 24 interviewees said time constraints were their greatest challenge to helping with homework. This theme was repeated across all three homework groups. For example, one father commented, "When I get home late, it's harder to help. I want to set a schedule--like one hour to decompress and then do homework." Despite the reported time constraints, interviewees indicated that homework was a priority. For example, one father commented, "We have very busy schedules. The kids are in sports and band, but homework comes first."

The second theme also emerged in response to a question about the challenges of helping with homework. Ten of the 24 interviewees mentioned that difficult concepts made helping with homework a challenge. This theme emerged in all three groups, but particularly in Group 3 (the group with the highest level of student-recorded family involvement). One mother suggested, "I've been out of high school for 25 years. Math has changed since I was in school." A 62-year-old father revealed, "I never went to high school and I'm illiterate. I took some math at a college so I could help my kids, but it's difficult. Kids have much more to learn now than when I went to school." When asked if they thought that workshops would be helpful, 13 of the 24 interviewees indicated that workshops or a homework hotline would be beneficial.

The third theme was associated with the notion of structured homework assignments, which stimulated comments from 16 of the 24 interviewees. Most of the parents favored structure. For example, a father noted that, "Structure is a good idea. If the assignment is straightforward, we can sit down and do it. There's less to figure out on directions."

IMPLICATIONS FOR PRACTICE

The purpose of this study was to investigate a middle-grades homework intervention designed to increase family involvement in homework. Using Bronfenbrenner's ecological model and Epstein's model of "overlapping spheres of influence," it was hypothesized that a teacher could influence students to entice parents or other family members to become involved with homework. Further, it was hypothesized that the teacher could directly influence family involvement with homework. Our findings provide empirical evidence that prompts are effective and, in many cases, necessary. The two groups that received involvement prompts showed significantly higher levels of family involvement than the group that received no involvement prompts. This is an important new finding because past research has asserted the benefits of involvement (Keith, 1992; Foyle & Bailey, 1986), but has not offered specific suggestions or strategies for involving families. In this section we discuss implications for two groups of family professionals: teachers who work with elementary school and middle school students and their families, and parent educators who work with parents of school-aged children. Specifically, we describe several promising strategies for increasing family involvement with children's homework.

Student prompts. Student prompts involved the teacher coaching the students to ask a family member to be involved with mathematics homework. Students were further prompted with printed directions on each homework assignment alerting them to specifics of how to involve a family member. This student prompting was related to significantly higher levels of parent involvement. Parents interviewed in the student prompt groups implied that their children's requests may have influenced their involvement. For example, one parent reported, "Our child said it was something we were supposed to do with him. Typically, he does not show us his homework." Another parent commented, "I looked forward to doing the homework. She [the student] hasn't always asked me to help before." The results of the homework survey also indicated that families in all three groups were more likely to be involved with homework if their children asked them to be involved.

Family prompts. Family prompts involved the teacher prompting families to offer feedback about the homework assignments and to include a signature on each assignment sheet. The majority of parents in this group (that included both student and family prompts) offered written feedback and regularly signed the homework sheets. Typical parental reactions included, "This is a good idea. Keep it up," and, "Hi [teacher] You got me on this one. I don't understand it." One parent spontaneously praised the request for a signature because "it made us accountable." This finding is noteworthy because, according to student reports, family members in this group were more involved with mathematics homework than were family members in either the no prompt or student-prompt-only groups. That is, it appears that teacher prompts coupled with student prompts contributed to higher levels of family involvement than did student prompts alone. Further, as revealed in the homework survey, families in all three groups indicated they were more likely to be involved with homework if their child's teacher asked them to be involved than if their child's teacher did not ask them to be involved.

Parent education. An important objective for parent educators is to teach parents and other adult family members that the responsibility for formally educating children can not be left solely to teachers. Across diverse family forms, parents, older siblings, grandparents, and other family members provide valuable resources for instilling and reinforcing the value of education and for assisting in homework completion. In our study, 87% of students worked with someone other than a parent for at least one of the assignments. Further, because many parents will not be prompted by their children nor by their children's teachers, parents need to regularly monitor homework assignments so they know how much homework their children have, how long it will take to complete the assignments, and whether younger children, especially, need assistance. Parents also need to understand that helping with homework and encouraging students to achieve academically do not require parents to provide direct, hands-on assistance throughout the duration of homework assignments. This is important for parents to understand because many parents feel ill-prepared to help with homework due to

competing demands on their energy and time and due to perceived (and sometimes real) inadequacies of their knowledge (Hoover-Dempsey, Bassler, & Burow, 1995). Many less intensive and less time-consuming types of parental involvement are effective in facilitating students' homework completion and academic achievement. For example, Sui-Chu and Willms (1996) studied the effects of several types of parental involvement (e.g., communication with the school, participation in school activities, monitoring homework) and found that home discussion of school activities was the strongest predictor of achievement for a national sample of eighth graders.

Research also suggests that parent involvement in school-related activities is most effective when sustained over time (Ekstrom et al., 1986; Gordon, 1979; Salerno & Fink, 1992). In a national study comparing school dropouts to high school graduates, Ekstrom et al. (1986) found that students are more likely to stay in school when parents are involved throughout their children's education. Yet studies show that parent involvement declines dramatically when children make the transition from the elementary to the middle grades (Carnegie Corporation, 1989; Epstein & Connors, 1995; Greenwood & Hickman, 1991). For example, Dauber and Epstein (1993) found that compared to elementary students, middle-grades students spend more time doing homework, but parents of middle-grades students report they feel less able to help their children with homework. Importantly, parent involvement surveys indicate that a question often asked by parents is: How can I help my child with homework? (Epstein, 1992, 1993; Foyle & Bailey, 1986).

One of the themes that emerged from the telephone interviews was that some family members were challenged by the homework concepts. Parents indicated that helping gets harder as children get older and that children today are taught differently from how parents were taught years ago. These findings provide further evidence that parents who find subject matter difficult to understand may not be able to help with homework in productive ways (Epstein & Connors, 1995; Salerno & Fink, 1992). Further, it may be unreasonable to expect increased student achievement based on family involvement. Indeed, the potential exists for confusion and losses in student achievement due to the involvement of parents who lack adequate content knowledge and skills. To minimize this problem, workshops could be offered to assist and guide family members' involvement in homework activities, and homework hotlines could be established to accommodate diverse work-family schedules and routines.

It may also be comforting to parents to know that it is both useful and advantageous for multiple family members to be involved. Different family members usually have different academic strengths, different work and school schedules, and different relationships with the child who needs assistance. Alternating the responsibilities for monitoring and assisting with homework eases the burden for the primary helper (typically the mother), reinforces the message through multiple socialization agents that education and homework are important, and often increases the quality of the assistance provided. For example, one parent commented, "My husband helps with math homework because he is better at that and I help with reading."

Unfortunately, higher levels of family involvement were not associated with higher student achievement in this study, raising the question--were there any perceived benefits associated with family involvement? Telephone interviews suggested that families who were involved became more aware of what their children were learning in mathematics. For example, one parent commented, "I was more involved. Usually I have no idea what she is doing." Another suggested, "We don't help as much as we used to. This homework forced us to interact. We loved the application part." In addition, the most frequent written comments, comprising nearly half the total comments, expressed enjoyment with the activities. This suggests that higher student achievement need not necessarily be the only outcome, nor the only goal, of family involvement efforts.

CONCLUSIONS

Family members' difficulties with concepts suggest that family involvement with homework is not necessarily a dichotomy (they help or don't help), but rather a continuum (they help to varying degrees and with varying effectiveness). What constitutes quality in terms of family involvement with homework and how that quality influences student achievement remains unknown. But written feedback on the assignments as well as interview

comments indicated that homework interactions are highly variable and that case studies should be conducted with diverse families (e.g., families representing diverse structures, ethnicities, and parent/child gender combinations) to explore the nuances of family involvement in homework activities and their impact on student achievement. Hopefully, future research will investigate the quality of family involvement as well as the quantity.

Our findings corroborate previous research suggesting that two-parent families are more likely to help with homework than are single-parent families (Bronstein, Clauson, Stoll, & Abrams, 1993; Furstenberg & Nord, 1985). It is interesting, however, that anecdotal comments by single parents support Dornbusch, Ritter, & Leiderman's (1987) contention that parenting style (e.g., "quality of involvement") may override the potential negative effects of single-parenthood and lower SES. For example, one single mother with no college degree was involved with each of the 20 homework assignments. This mother indicated she ". . . enjoyed the challenge of the assignments and working with my daughter." She reported that she set aside time each evening after putting her baby to bed to help her daughter with homework. This student (in the group receiving student and family prompts) achieved 87% on the posttest (group mean was 68%). Another single-mother whose son achieved 85% on the posttest was from the "no prompt" group, but became involved with the mathematics homework anyway. She reported, "We sit down together to do homework assignments and I enjoy it. It helps my son realize I'm not just a person who does dishes and takes out trash."

This study adds to the knowledge base on the design of family involvement research. Numerous existing studies that have examined parent involvement have been criticized for offering indirect evidence in comparing several schools or institutions on the variable of parent involvement (White, Taylor, & Moss, 1992). In contrast, the current study offers direct evidence by comparing students who were enrolled in the same school, who were taught by the same teacher, and who completed the same mathematics problems. Prompting for family involvement was the only variable manipulated in this study.

Our data indicate that student and family involvement prompts were associated with higher levels of family involvement with middle-grades homework, a trend contrary to the literature that has suggested involvement declines when children make the transition from the elementary to the middle grades (Carnegie Corporation, 1989; Epstein & Connors, 1995; Greenwood & Hickman, 1991). Thus, our findings suggest that a family involvement initiative that includes student and family prompts can influence higher levels of involvement for those middle-grades families who otherwise might not be involved. The issues surrounding family involvement and student achievement are particularly significant in the context of the national education goals recently adopted and widely advocated by the U.S. Congress, one of which explicitly promotes "partnerships that will increase parental involvement and participation" in children's schoolwork (National Education Goals Panel, 1994, p. 11).

The results of the current study support previous findings that parents' educational and socioeconomic resources are good predictors of student achievement (Coleman et al., 1966; Dornbusch et al., 1987; Revicki, 1981). However, we found that parents of diverse educational levels report similar levels of involvement in children's homework. Importantly, our telephone interview data and written comments from family members indicate that parents with less education may need guidance from the schools in order for them to assist their children in productive ways. An important implication for practice may be to focus on teacher training, parent training, parent education, and fuller use of multiple family members rather than relying exclusively on classroom interventions to bolster academic achievement.

Table 1: Mean Levels of Family Member-Reported Family Involvement with Mathematics Homework (1 = never; 5 = always).

	Mean	(SD)		
No prompts (n = 25)	2.74	(0.95)		
Student prompts (n = 22)	4.03	(1.00)		
Student & family prompts (n = 22)	3.88	(0.84)		
Source	Sum of squares	df	Mean squares	F-ratio
Between groups	23.79	2	11.90	13.61[a]
Error	57.69	66	0.87	

a p < .01.

Table 2: Mean Levels of Reported Family Involvement with Other Homework and with Mathematics Homework.

	Other homework		Math homework	
	Mean	SD	Mean	SD
No prompts (n = 25)	3.12	(0.68)	2.74	(0.95)
Student prompts (n = 22)	3.58	(0.75)	4.03	(1.00)
Std. & fam. prompts (n = 22)	3.27	(0.72)	3.88	(0.84)
Source	Sum of squares	df	Mean squares	F-ratio
Between groups	2.27	2	1.13	2.24
Error	33.49	66	0.50	

Table 3: Family Involvement and Student Achievement by Parent Education Level.

Legend for Chart:

- A - Family involvement, n
- B - Family involvement, Mean
- C - Family involvement, (SD)
- D - Family involvement, t-value
- E - Student achievement, n
- F - Student achievement, Mean
- G - Student achievement, (SD)
- H - Student achievement, t-value

	A	B	C	D
	E	F	G	H
College degree	34	3.52	(1.24)	--
	34	76.94	(16.24)	--
No degree	35	3.51	(0.95)	0.06
	40	59.62	(20.37)	3.99[a]

a p < .01.

Table 4: Family Involvement and Student Achievement by Family Structure.				
Legend for Chart:				
A - Family involvement, n				
B - Family involvement, Mean				
C - Family involvement, (SD)				
D - Family involvement, t-value				
E - Student achievement, n				
F - Student achievement, Mean				
G - Student achievement, (SD)				
H - Student achievement, t-value				
	A	B	C	D
	E	F	G	H
2-parent	56	3.71	(0.9)	--
	58	69.34	(19.27)	--
1-parent	13	2.67	(1.3)	3.29[a]
	16	61.19	(23.67)	1.43
a p < .01.				

Table 5: Regression of Family Involvement with Mathematics Homework on Parent Education, Family Structure, and Family Size, Controlling for Group (Classroom)				
Predictors	b	SE B	Beta	T
Parent education	-.259	.215	-.132	-1.201
Family structure	1.091	.261	.460	4.181[a]
Family size	-.376	.225	-.184	-1.666
(Constant)	-.602	.249	-2.416	
Multiple R	.48			
R square	.23			
Adjusted R square	.19			
a p < .01.				

Table 6: Regression of Posttest Mathematics Achievement on Parent Education, Family Structure, and Family Size, Controlling for Prior Mathematics Achievement				
Predictors	b	SE B	Beta	T
Parent education	7.452	3.032	.273	2.457[b]
Family structure	7.694	3.671	.232	2.096[a]
Family size	3.533	3.173	.124	1.114
(Constant)	-10.696	3.531	-3.030	
Multiple R	.39			
R square	.15			
Adjusted R square	.12			
a p < .05, b p < .01.				

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