

Effects of Parental Involvement on Achievement for Students Who Attend School in Rural America

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The purpose of this study was to compare the levels and effects on achievement of parental involvement for students in rural versus urban and suburban schools. Latent variable structural equation modeling was used to determine the effects of rural versus urban or suburban residence on parental involvement and change in achievement from eighth to tenth grade, and to compare the relative effects of parental involvement on achievement in rural versus nonrural schools. The results suggest that rural school attendance does not affect either parental involvement or change in achievement, and that parental involvement has the same effects on the achievement of students in rural schools as in urban or suburban schools. The effect of parental involvement on achievement is small, but significant and important. The findings suggest that group programs and individual interventions designed to increase parental involvement, if successful, will be equally effective in increasing achievement in rural, urban, and suburban schools.

Rural schools are responsible for the education of a significant portion of American school children. Forty-six percent of the school districts in the United States are considered rural (Office of Educational Research and Improvement [OERI], 1994). These districts include 28% of the country's schools and serve 17% of America's school children (OERI, 1994). Understanding and improving the delivery of services to this population will have important outcomes for these children, rural communities, and the nation at large.

Serving the educational needs of children in rural America poses a unique challenge for educators. Rural schools have several distinct advantages: They often enjoy strong community support (Meehan & DeYoung, 1987) and more parental involvement than nonrural schools (Williams, 1978). They may offer flexible scheduling, provide more individualized instruction, have smaller class sizes, lower dropout rates, and safer school environments than their urban and suburban counterparts, and rural schools may expand curricular offerings via cooperative agreements with other school districts (cf. Helge, 1983; Stephens, 1988a).

In contrast, a host of concerns plague rural schools: Rural schools typically lack the facilities, physical plants, course offerings, and educational programs of larger, more resource-rich districts. Nationwide school excellence and

reform movements impose additional constraints on rural schools (Stephens, 1988b). A sparse population base results in geographic and cultural isolation, limited economic development, and restricted educational opportunities (Davis, 1985). In addition, rural schools face a major problem in recruiting and retaining qualified teachers and support personnel. Teachers in rural districts are younger, less experienced, and hold fewer specialty or graduate degrees than teachers in nonrural settings (OERI, 1994). Such conditions often limit rural school students' opportunities to learn and may contribute to the idea that rural schools are inferior to schools in other settings (Stephens, Willis, & Sanders, 1988).

These contrasting images of rural schools have done little to inform educators and administrators about the important influences on the achievement of students in rural schools. Recent findings of several national education surveys suggest that the achievement of rural students has improved in the last decade, and now approaches the national mean (OERI, 1994). Rural schools may lack the resources of urban and suburban schools, but it is unclear whether this shortcoming has a detrimental impact on rural students. It is also unclear if the advantages of rural schools translate into increased learning.

Unfortunately, research on the characteristics of rural schools that improve student outcomes has been sparse. Research on rural schools has lagged behind that of metropolitan counterparts because, in part, policymakers believed that the rural lifestyle was becoming increasingly obsolete and that education would move toward a more urban model to succeed (Meehan & DeYoung, 1987). Efforts to improve or reform rural schools are generally not based on

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research demonstrating inferior student achievement, but on the assumption that lower resources would necessarily result in lower student outcomes (Meehan & DeYoung, 1987). Yet rural schools may also offer more community support and greater parental involvement, and these variables may improve the learning of students in rural schools.

Parental Involvement

The National Education Goals Panel (1995) listed as its eighth goal the promotion of parental involvement and participation. Every state is to develop policies that will help local educational agencies and schools increase parental involvement by the year 2000. Schools are actively to engage parents in supporting the academic work of children at home, to share with parents educational decision making, and to ensure that schools are adequately supported. Additionally, parents are encouraged to hold schools and teachers to high standards of accountability. Schools are increasing their focus on parental involvement in the education of their students and the organization of their schools as part of the latest educational reform movement.

The realities of the educational reform movement and the needs of contemporary society place increasing burdens on schools (Pogrow, 1996). It is not surprising that administrators, principals, and teachers often are overwhelmed with national goals and objectives (school completion, student achievement, math and science requirements, adult literacy, and safe, disciplined, and alcohol- and drug-free schools). With the increasing use of site-based management and steering committees whose members include parents, it is not surprising that "American education has 'rediscovered' parental involvement and the popular press, policy makers and school administrators have pounced upon [it] as the latest panacea to improve school learning" (Keith et al., 1993, p. 474).

Just how does one define parental involvement? The widely disseminated U.S. Department of Education publication, *What Works: Research about Teaching and Learning* (1986), suggested that parental activities such as reading to children and encouraging independent reading are important influences on children's learning. Others have used the term parental involvement to mean parental participation in school activities (e.g., Cervone & O'Leary, 1982), a more general parental interest and involvement in students' academic and social lives (e.g., Keith, Reimers, Fehrmann, Pottebaum, & Aubey, 1986), or parental educational aspirations and expectations (Seginer, 1983). All of these definitions, whether focused on specific behaviors or more general attitudes, appear to be legitimate descriptions of the ways in which parents can help their children achieve in school (Epstein, 1995; Keith, 1991).

A growing body of literature supports the influence of parental involvement on the achievement of students in a

variety of educational settings and using a number of definitions of parental involvement (Christenson, Rounds, & Gorney, 1992). One recent study examined the effects of parental involvement on achievement for over 20,000 eighth grade students from the National Education Longitudinal Study (Keith et al., 1993). Keith and colleagues used structural equation modeling and found that parental involvement had a significant effect on eighth grade achievement. Still, different definitions of parental involvement may have differential effects on achievement; for middle school youth, for example, parental aspirations appear to be more important than communication, home rules and structure, and participation in school activities (Singh et al., 1995). It also seems likely that different aspects of parental involvement become important at different ages (Keith, 1991).

In addition to being important for achievement, parental involvement also may be an advantage of rural schools. Rural schools are important to their communities; their sports and cultural events provide community activities, and the accomplishments of their students are a source of community pride (Carlsen & Dunne, 1981). Parents of rural students appear more involved in school activities than their urban or suburban counterparts (Williams, 1978). Yet there is little research to suggest that such community involvement, or even the type of parental involvement that exists in rural schools, translates into the type of parental involvement that produces higher academic outcomes.

The purpose of the current study was to determine the levels and effects of parental involvement in rural schools, in comparison to urban and suburban schools. We sought to determine: (1) whether parents of students in rural schools are more involved in their children's education than are parents in suburban or urban schools; (2) the effect of rural versus nonrural schooling on the change in achievement from eighth to tenth grade; and (3) whether parental involvement has the same magnitude of influence on the achievement of youth in rural schools as it does on the achievement of youth in suburban or urban schools.

Method

Participants

The data were drawn from the base year (1988) and the first follow-up (1990) of the National Education Longitudinal Study (NELS). NELS is the third in a series of national longitudinal education studies from the National Center for Education Statistics. It provides extensive information about a nationally representative sample of more than 17,000 students (at the time of the first follow-up), their teachers, parents, and school administrators. The students were in eighth grade during the base year survey, and in tenth grade during the first follow-up. This study included only those students from NELS who completed

both initial and follow-up surveys and academic tests, and whose parents also completed a base year survey. The final sample included 16,378 students and their parents.

Analyses

Latent variable structural equation modeling (SEM) was used to determine the extent of the influence of attending a rural school (as opposed to an urban or suburban school) on both general parental involvement and on tenth grade academic achievement (as measured by a series of standardized tests in reading, mathematics, science, and social studies). Relevant background influences (ethnicity, family background, and eighth grade achievement) were also controlled. A longitudinal model was analyzed, with ethnicity, family background, rural versus nonrural school, eighth grade achievement, and parental involvement measured in 1988, and tenth grade achievement measured in 1990.

A second series of analyses examined the effects of parental involvement on achievement separately for rural, urban, and suburban schools. A difference in the magnitude of influence of parental involvement on achievement for rural as opposed to other schools would suggest that each unit of parental involvement has different effects in different types of schools. For example, the finding of a stronger effect for parental involvement in rural than in urban schools would suggest that each additional unit of involvement produced greater achievement gains in rural than in urban schools.

The SPSS program was used to select variables, merge files, and create composites. Correlations and standard deviations were output from SPSS and used as input into the structural equations program, Amos (Arbuckle, 1995).

Model

The model that guided these analyses is shown in Figure 1 and is based on parental involvement theory and previous research (e.g., Epstein, 1991; Keith & Lichtman, 1994; Keith et al., 1993). The model shown is designed to test the effects of attending a rural school (as opposed to a suburban or urban school) on both parental involvement and on subsequent achievement, and thus variables representing these three constructs are included in the model. Several other variables are included in the model to fulfill other purposes. Ethnicity and family background are included because they are background characteristics commonly included in such models. Previous achievement is included in the model as a possible common cause of parental involvement and tenth grade achievement; if previous achievement or some related measure (e.g., ability) were omitted, the effects of parental involvement on achievement would likely be spuriously inflated.

It should be noted that the model tests the longitudinal effects of parental involvement on later achievement. The background variables (ethnicity and family background), rural versus nonrural residence, previous achievement, and parental involvement were measured in 1988 in the NELS base year survey. Achievement was measured in 1990 with the NELS first follow-up. Thus the model tests the influence of parental involvement on change in achievement over a 2-year period.

The variables enclosed in rectangles are measured variables, created from individual questionnaire items (e.g., ethnic) and composites of items (e.g., aspirations, communication). Variables enclosed in ovals are latent variables or factors, estimated from the measured variables. The arrows from ovals to rectangles specify the measurement portion of the model, a confirmatory factor analysis of the latent and measured variables. The arrows from one oval to another represent the structural model, specifying the influence of one latent variable on another. The structural model is, in essence, a path analysis of the latent variables, conducted simultaneously with the confirmatory factor analysis of the latent variables. The curved lines among the exogenous (causal) variables represent correlations.

Also included in the model are the disturbances of the latent variables (labeled d_1 , etc.), representing all other influences on these variables from outside the model, and unique and error variances (or residuals) of the measured variables (labeled r_1 , r_2 , r_3 , etc.), representing other influences on the measured variables other than the latent variables. The curved lines between the measured indicators of previous achievement (e.g., Reading 88) and achievement (e.g., Reading 90) allow the unique and error variances of the tests to be correlated over time. Allowing such correlated errors is tantamount to the recognition that these tests administered in 1988 and again in 1990 share more than just general achievement. The reading tests, for example, measure reading achievement in addition to general achievement.

Variables in the Model

Ethnicity and family background were background variables derived from the base year student and parent surveys. The latent variable ethnicity had one measured indicator (ethnic). This measured variable was coded 1 for White and Asian American students and 0 for all other students (African-, Hispanic-, and Native American descent). The coding was based on previous research suggesting that the influences on the learning of Asian-American youth are more similar to those of White youth than to those of other minority groups (Keith & Cool, 1992). Family background was estimated from three measured variables: parent occupational status, parent education, and family income.

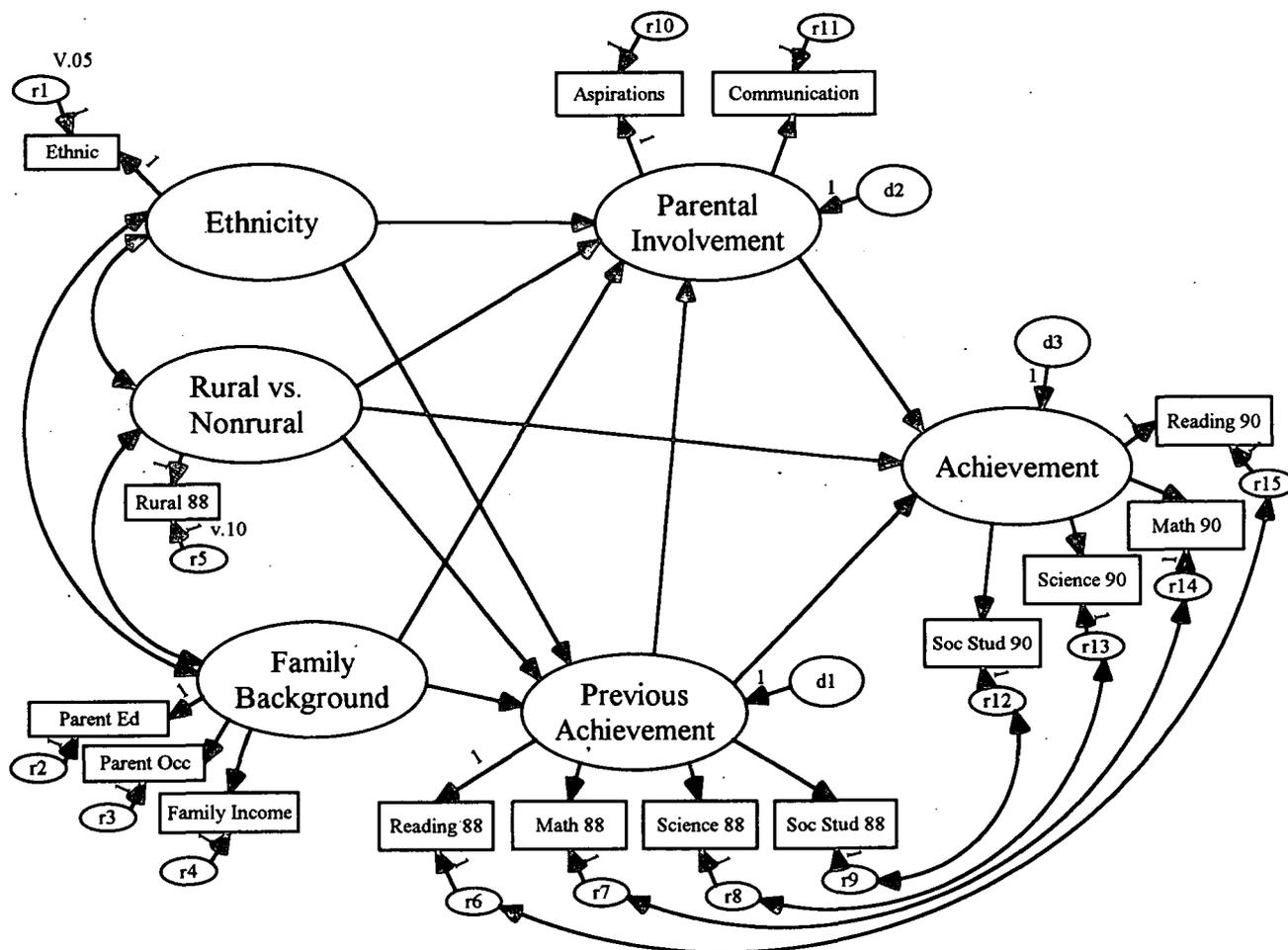


Figure 1. Model of the effects of rural versus urban or suburban residence on parental involvement and tenth grade achievement.

Rural versus nonrural was indexed by a base year composite (Rural 88), designed to compare students from rural schools with those from urban and suburban schools. Rural 88 was created by recoding G8URBAN, a composite created by NCES to reflect the urbanicity of the students' schools. Urban and suburban were coded as 0 and rural was coded as 1. In subsequent models, rural versus nonrural was excluded from the model and the model analyzed separately for students from rural, urban, and suburban schools.¹

Previous achievement was estimated from four short achievement tests administered in 1988: Reading, Mathematics, Science, and Social Studies. The tests appear to have adequate reliability and validity for research purposes (Rock & Pollack, 1991).

Parental involvement was based on the same composites used by Keith and colleagues (1993). Aspirations was a composite of parents' educational aspirations for their

children, as reported by both parents and their children. Communication was a composite of items concerning the amount of communication between parents and their children about school and school activities. Both indicators of parental involvement were weighted to include half student response and half parent response; both were derived from 1988 parent and student questionnaires.

¹In order for the model to be identified, it is necessary to constrain the error variances (r1 and r5) associated with latent variables with single indicators (ethnicity and rural vs. nonrural) to some prespecified value. A value of zero could be used, but assumes that the measured variables are perfectly reliable. Instead, we estimated that 5% of the variance in ethnic was due to unreliability and that 10% of the variance in Rural 88 was due to error. Thus the variance of r1 is shown in Figure 1 as .05 times the variance of ethnic, and the variance of r5 is shown as .10 times the variance of Rural 88.

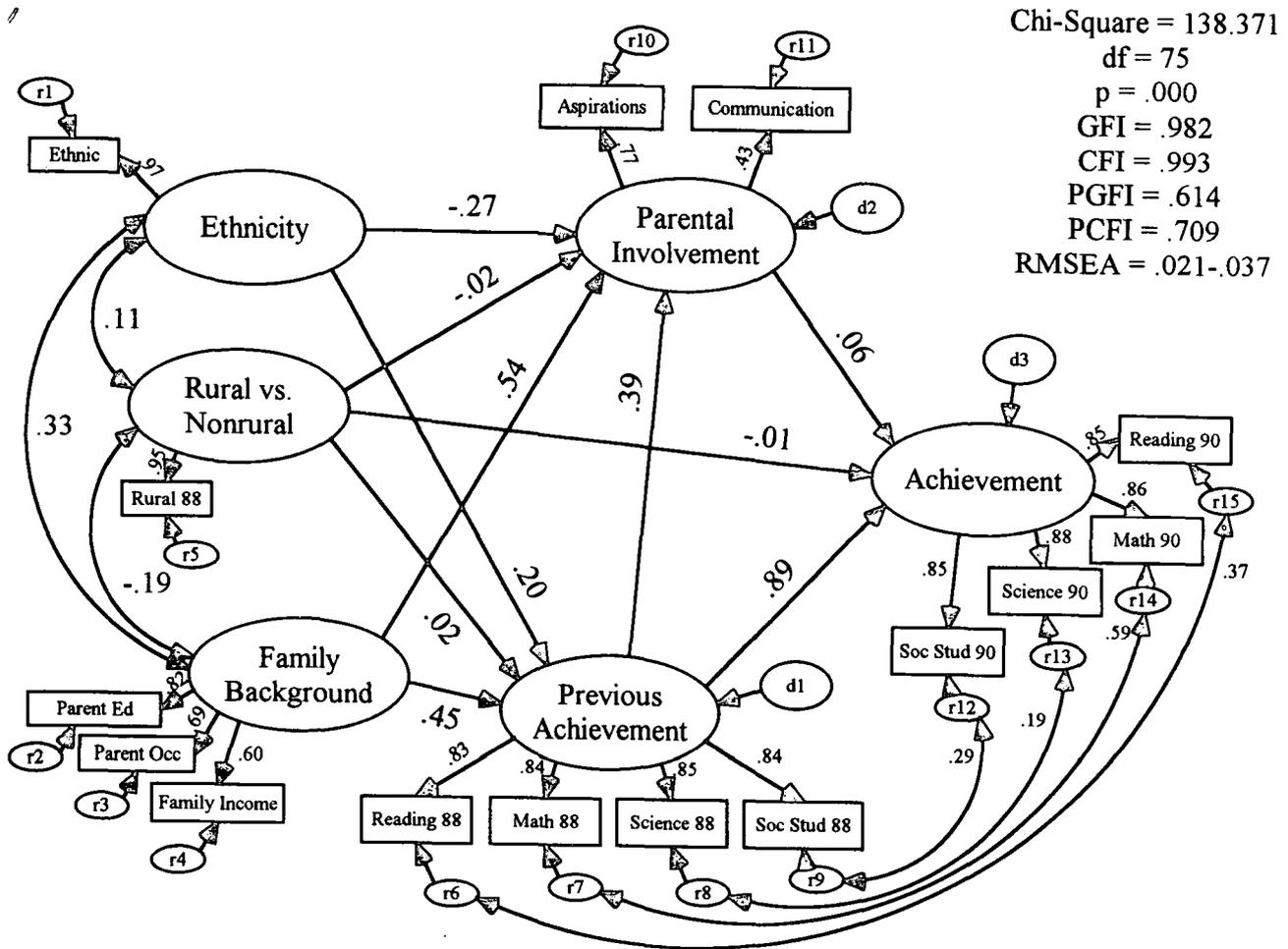


Figure 2. Initial analysis of the effects of rural versus urban or suburban schooling on parental involvement and change in achievement.

Achievement was indexed by four short achievement tests in reading, mathematics, science, and social studies administered in 1990. Like the 1988 tests, the 1990 tests were developed for NCES by the Educational Testing Service.

More detail about each variable, including its composition, coding, and origin, is found in the Appendix.

Results

Effects of Rural versus Nonrural Schooling on Parental Involvement and Achievement

The first set of analyses tested the extent of the influence of rural versus urban or suburban school setting on the extent of eighth grade parental involvement and on the change in achievement from eighth to tenth grade. The means, standard deviations, and intercorrelations for the

measured variables are shown in Table 1; the results of the first SEM are shown in Figure 2.²

The upper right corner of the figure shows various fit indices used to assess the adequacy of the model. Listed first are χ^2 , the associated degrees of freedom, and probability that the model, as shown, fits in the population. Models with a $p > .05$ are said to provide a good fit, whereas models with a smaller probability may be problematic. Unfortunately, χ^2 is directly related to sample size, so that with large samples, even trivial departures from fit will result in a large χ^2 and the rejection of a good model (Bentler & Bonett, 1980; Marsh, Balla, & McDonald, 1988). To address this weakness, we report the χ^2 with a still large sample size of 1,000 rather than the actual sample size of

²Additional detail concerning these analyses (e.g., unstandardized coefficients, standard errors, and squared multiple correlations) are available from the first author by request.

Table 1
Correlations, Means, and Standard Deviations of Measured Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) Reading 88						
(2) Math 88	.69					
(3) Science 88	.70	.72				
(4) Social Studies 88	.72	.68	.72			
(5) Aspiration	.38	.40	.35	.37		
(6) Communication	.23	.20	.20	.22	.33	
(7) Reading 90	.76	.67	.66	.68	.38	.21
(8) Math 90	.67	.84	.68	.65	.42	.19
(9) Science 90	.65	.71	.73	.67	.36	.19
(10) Social Studies 90	.67	.64	.67	.74	.38	.20
(11) Rural	-.05	-.05	-.01	-.05	-.13	-.07
(12) Ethnic	.26	.30	.29	.26	.02	.07
(13) Parent Education	.34	.38	.33	.35	.41	.25
(14) Parent Occupation	.29	.31	.28	.29	.33	.23
(15) Family Income	.25	.31	.25	.26	.29	.19
<i>M</i>	50.39	50.50	50.40	50.45	.06	.03
<i>SD</i>	9.94	9.92	9.96	9.87	.82	.77

Note. $N = 16,378$. In order to estimate the model, the decimal place for the standard deviation of family income was moved to the left three places.

over 16,000. Nevertheless, the significant χ^2 shown suggests that the model does not provide a good fit to the data.

Shown next are several other fit indices that focus on different dimensions of fit. The Goodness of Fit Index (GFI = .982) is a measure of the "relative amount of variances and covariances" accounted for by the model (Hu & Bentler, 1995, p. 86); the Comparative Fit Index (CFI = .993) compares the model with a null model in which it is assumed that the variables are unrelated to each other. For both the GFI and CFI, fit improves as the index approaches 1.0; common rules of thumb suggest values above .90 represent a good fit. The Parsimony GFI (PGFI = .614) and CFI (PCFI = .709) are shown next; both adjust their corresponding indices by the parsimony of the model (e.g., Mulaik et al., 1989). Parsimony indices are useful primarily for comparing competing models. The final fit index shown is the 90% confidence interval for the root mean square error of approximation (RMSEA = .021 to .037), a measure of the approximate fit of the model to the population. RMSEAs of .05 or below suggest a good fit of the model (Browne & Cudeck, 1993).³ All of the supplemental fit indices suggest that the model provides an excellent fit to the data.

Of primary interest in this research, the paths from rural versus nonrural residence to parental involvement and

to achievement were tiny (-.02 and -.01, respectively) and were also insignificant ($t < 1.96$). This finding suggests that rural residence has no effect on parental involvement and no effect on achievement. These hypotheses were further tested by removing those paths from the model and comparing the resulting fit with the initial model. Since the path from rural versus nonrural to previous achievement was insignificant, it too was removed. The resulting model is shown in Figure 3. Despite its weaknesses as a measure of absolute fit, χ^2 can be quite effective as a method of comparing competing models (Hoyle & Panter, 1995). If two models are nested (one model is a more constrained version of another model), the χ^2 s for the two models can be compared; the resulting χ^2 difference ($\Delta\chi^2$) can be used as a statistical comparison of the two models. The deletion of the three paths from rural versus nonrural residence resulted in a slight increase in χ^2 ($\Delta\chi^2 = .855$), but this change was insignificant ($\Delta df = 3, p > .05$). None of the other fit indices deteriorated as a result of these model changes, and the parsimony indices improved slightly.

Thus, the model specifying no effects for rural versus nonrural residence fits as well as, and is more parsimonious than, the model specifying the existence of such influences. The model shown in Figure 3 was therefore accepted as the final model of the effects of rural versus nonrural schooling on parental involvement and achievement. That

³For a comparison of these and other fit indices, see Hu and Bentler (1995) or Tanaka (1994).

Table 1 (Continued)

(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
.74								
.73	.77							
.75	.70	.76						
-.07	-.06	-.03	-.06					
.24	.28	.32	.24	.10				
.34	.38	.37	.36	-.13	.24			
.29	.31	.29	.28	-.14	.24	.57		
.26	.30	.29	.26	-.14	.22	.50	.39	
50.28	50.35	50.28	50.31	.31	.77	3.08	51.52	40084.83
9.95	9.89	9.96	9.90	.46	.42	1.20	20.77	35972.62

model, in turn, shows no effects for rural schooling on either parental involvement or achievement. Therefore, it appears that parents of students in rural schools are no more involved in their children's education than are parents in suburban and urban schools, and that rural residence has no influence on the change in achievement from eighth to tenth grade.

Other aspects of the model (Figure 3) are also worth interpreting. The strongest influence on tenth grade achievement was, not surprisingly, eighth grade achievement. The standardized path (β) of .89 suggests that for each standard deviation increase in eighth grade achievement, tenth grade achievement will increase by .89 *SD*. Achievement, as measured by global, summative achievement tests, shows little change over a 2-year period; the students who performed well in 1988 were the ones who performed well in 1990.

Given this lack of change in achievement over a 2-year period, it is remarkable that parental involvement still had a meaningful and significant effect on achievement ($\beta = .07$). Although it is tempting to discount this effect as small, the effect is important because it demonstrates the effect of parental involvement on change in achievement over time. Thus, the path from parental involvement to achievement suggests that parental involvement influences the change in achievement over this critical 2-year period as students make the transition from middle to high school.

The path from previous achievement to parental involvement ($\beta = .39$) suggests that parents of students who had previous high achievement were more involved than parents of students with lower previous achievement. In other words, it appears that higher achievement leads to more parental involvement which, in turn, leads to continued higher achievement.⁴ The path from family background to parental involvement ($\beta = .55$) suggests that students from more advantaged backgrounds enjoyed more involvement than students from lower SES backgrounds. The negative path from ethnicity to parental involvement ($\beta = -.27$) suggests that, other effects being equal, minority students reported more involvement than White and Asian-American students (cf. Keith et al., 1993).

⁴The relations among previous achievement, parental involvement, and achievement also illustrate the importance of including measures of previous achievement or other similar variables (e.g., ability, aptitude) in nonexperimental analyses of the effects of parental involvement. In the jargon of SEM, previous achievement is a "common cause" of parental involvement and achievement. If it were excluded from the model, the apparent effect of parental involvement on achievement would be spuriously inflated to a value of .48! Other nonexperimental research that has not included similar measures has likely also produced inflated estimates of the effects of parental involvement.

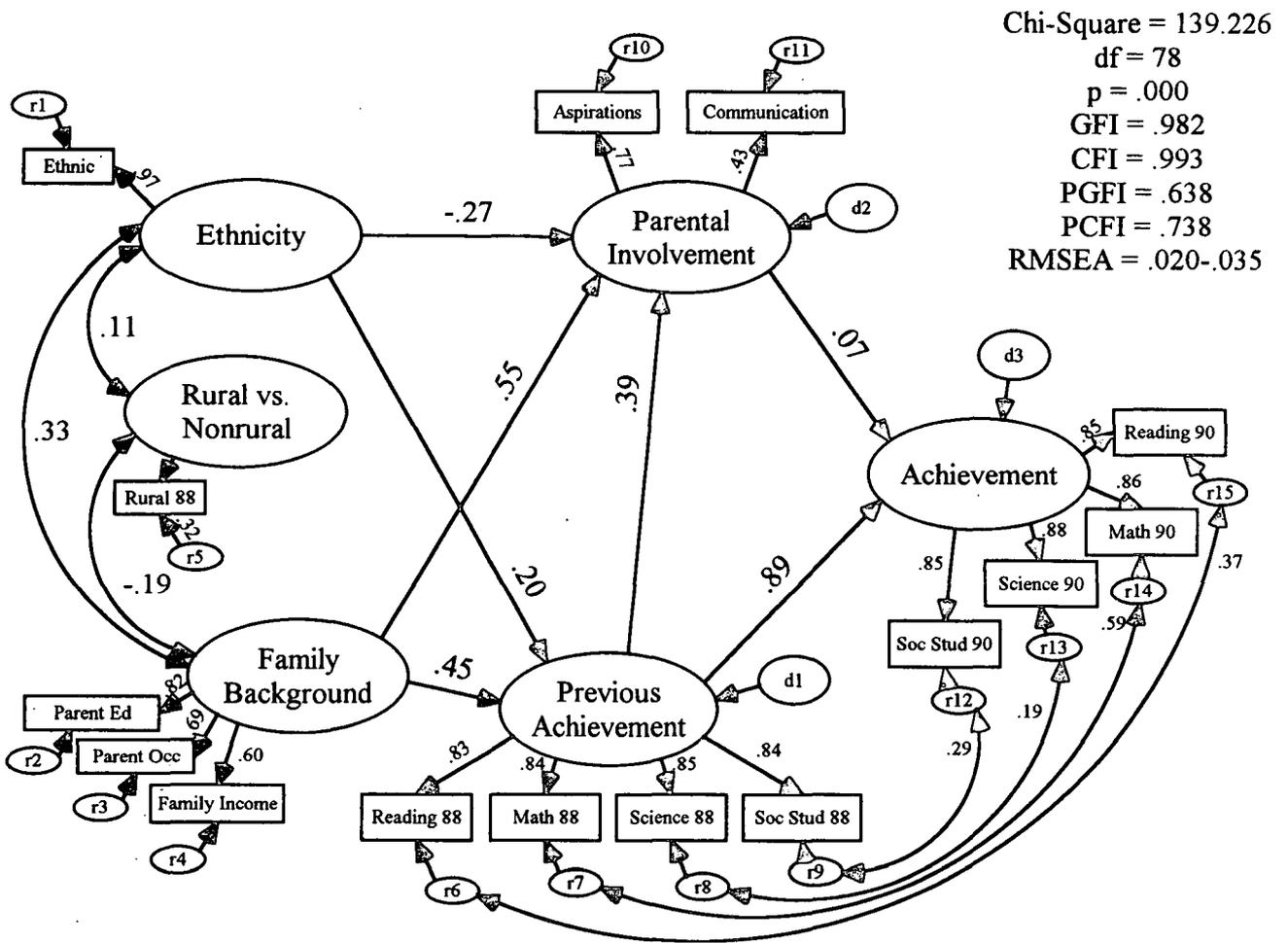


Figure 3. Final model of the effects of rural schooling on parental involvement and achievement.

Effects of Parental Involvement for Rural, Suburban, and Urban Schools

In the second set of analyses, the parental involvement model was estimated separately for students from rural, urban, and suburban schools using a multi-sample analysis. First, the models were specified as being invariant across rural, urban, and suburban groups; that is, although we analyzed the model separately for each group, we specified that all paths and factor loadings were identical for rural, urban, and suburban youth.⁵ This model, shown in Figure 4, fit quite well. All fit indices (shown in Figure 4 and in

⁵For these analyses, the sample sizes for each group were set to 333, for a total *N* of 999. This procedure was used to help obviate the problem of χ^2 's relation to sample size and to equalize the three groups so that the final solution would not be overly weighted by the data from one group.

Table 2) suggested an excellent fit of the model to the data (the RMSEA is not shown, but was 0, also suggesting an excellent fit). The next step was to allow the path from parental involvement to achievement to vary across rural, urban, and suburban settings.

As shown in Table 2, this change in the model resulted in no improvement in fit, and a decrease in parsimony over the first model. In other words, allowing the path from parental involvement to achievement to be different for rural, urban, and suburban students did not improve the model; the hypothesis that the path is identical across groups could not be rejected. This finding suggests that parental involvement has the same magnitude of influence on the achievement of rural, urban, and suburban students. Therefore, it appears that parental involvement has equivalent effects on the achievement of all students.

The third analytic step allowed all paths to vary across groups, but the factor loadings remained invariant across

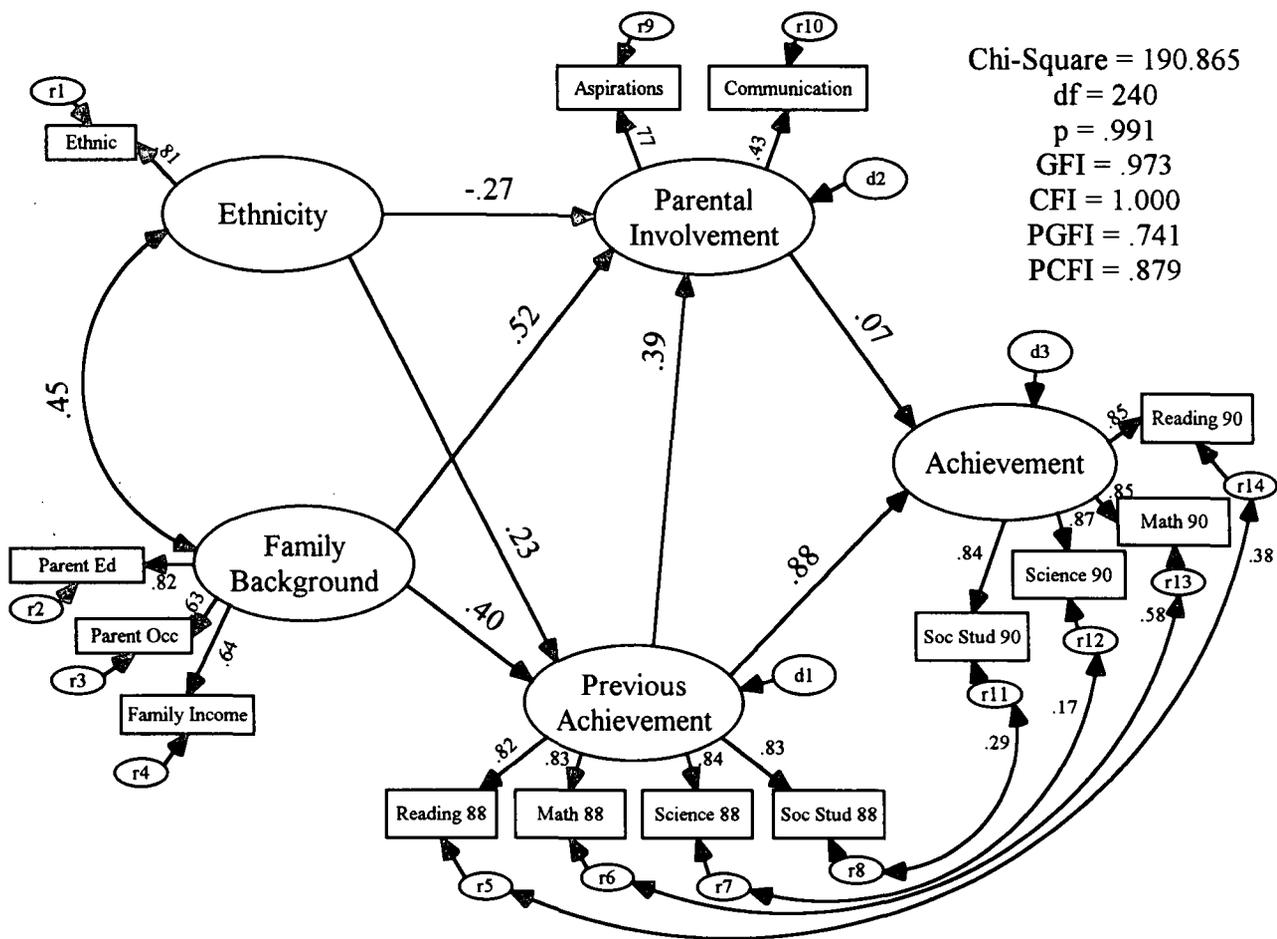


Figure 4. Effects of parental involvement on change in achievement across groups.

groups. This third model, if supported, would suggest that the constructs in the model (parental involvement, achievement, etc.) are identical across groups, but that the influences of the constructs on each other were different for each group. The fit indices presented in Table 2 suggest that this model also does not lead to an improvement of fit over Model 1. In particular, $\Delta\chi^2$ was insignificant, and although there was a slight improvement in the GFI, the PGFI and PCFI suggested a worse fit for this model over the first model. Model 3 thus suggests that the magnitude of all of the paths in the model are the same for rural, urban, and suburban students, and that the influences on the learning of these students are quite similar. The final model allowed all paths and factor loadings to vary across groups, testing the hypothesis that both the constructs and the influences differed across groups. Again, this hypothesis was not supported.

This series of multi-sample analyses suggests that the initial model, a model specifying that both factor loadings and paths had the same magnitude for rural, urban, and suburban students, provides the best explanation of the data of the four models tested. This finding, in turn, suggests that (a) the constructs of interest in this research have the same meaning and can be measured in the same fashion for rural as for urban and suburban students, (b) parental involvement has the same influence on learning for rural as for other students, and (c) all other variables in the model have the same influence for rural as for other students.

Summary

National education goals and reform movements place growing expectations on rural school districts. Instead of rural educators feeling pressured to say that they know how to solve and manage problems in schools, they need to be

Table 2

Comparison of Models Testing the Similarity of Parental Involvement Influences Across Rural, Urban, and Suburban Schools

Models	$\chi^2(df)$	p	$\Delta\chi^2(df)^a$	Δp	GFI	CFI	PGFI	PCFI
1. Invariant across rural, urban, suburban schools	190.87(240)	.99			.973	1.00	.741	.879
2. PI to achievement path varies across groups	190.31(238)	.99	.56 (2)	>.05	.973	1.00	.735	.872
3. Paths free, factor loadings invariant	168.20(224)	.99	22.67(16)	>.05	.976	1.00	.694	.821
4. All paths and loadings free across groups	151.24(198)	.99	39.62(42)	>.05	.979	1.00	.615	.725

^aEach model is compared to the first model.

able to say that research is still needed to determine the best practices to educate children in rural areas. Research can aid school administrators, teachers, and others in understanding rural parental involvement, rural student outcomes, and the achievement patterns of high school students. Prior research has demonstrated that parental involvement has a positive effect on eighth grade achievement (Keith et al., 1993). Research has also suggested that parents are more involved in rural schools than in suburban and urban schools (Williams, 1978). However, no investigations have been performed which examined student academic achievement, the nature of the school the student attended (rural, suburban, or urban), and the extent of the influence of parent involvement on student learning.

The purpose of this study was to explore the effects of parental involvement on the achievement of youth in rural schools. Are parents in rural schools more involved? Does parental involvement have the same magnitude of influence on achievement in rural schools as in urban or suburban schools?

The four primary findings suggest that: (a) Parents of children who attend a rural school are no more involved, and no less involved, in their learning than are parents whose children attend urban or suburban schools; (b) Students who attend rural schools have similar levels of eighth and tenth grade academic achievement as students in urban and suburban settings; (c) Parental involvement has the same effect on the achievement of rural students as it does for students in urban and suburban settings; and (d) Parental involvement has a small but important effect on the change in achievement from 8th to 10th grade.

Our results also suggest that parents of high achieving students communicate more frequently and have higher edu-

cational aspirations for their children than do parents of lower achieving students. High achievement seems to foster involvement which, in turn, fosters high achievement. Furthermore, there were significant differences in the amount of parental involvement between ethnic groups; White and Asian parents and students reported less involvement than other parents. This is an interesting, although not uncommon, finding that warrants further investigation.

This research used a nationally representative sample of students and the sample size is sufficiently large to use SEM effectively, yet some limitations do exist. First, it may be difficult to categorize many communities and schools, and the NELS rural, urban, and suburban categorization is undoubtedly crude. Furthermore, although town/community size is often used to label populations in various geographical locations, it may not be the best method of determining where students live. With the school consolidation movement, small rural communities may send their children to large rural high schools. Do these large schools, where students and perhaps even teachers spend much time in-transit, still have the same community identity, parental involvement, and values as smaller rural schools had in the past? Has technology or access to technology become a more important differentiation between children that where they live? Are school districts', families, or children's self efficacy more important than the location of the school? All of these are important considerations and are areas where future research is needed.

Implications

Since increased parental involvement is a national goal to be reached by the year 2000, it has important implica-

tions for those involved in educational decision making in rural areas. It is known that parental involvement is a potentially manipulable influence on learning, and that parental involvement is an important influence on student achievement (Christenson et al., 1992). Although prior studies have demonstrated a relation between parental involvement and elementary and middle school achievement, the current research found that parental involvement continues to be an important influence on students' achievement as they transition from middle to high school.

The findings of similar influences across school locations means that research on parental involvement is equally applicable for students no matter where they live. This should be good news for rural educators; interventions or programs that are effective and valued in urban and suburban communities by parents and schools should be considered for possible implementation in rural schools. With dwindling economic resources and aging physical plants, and increasing demands for curricular options and expanded services, rural school districts can increase home-school collaboration activities by borrowing and modifying interventions and programs that have been successful throughout the country. Educators know that parents are often an untapped or under-used resource in rural areas.

More importantly, because parental involvement affects the learning of all students, efforts to improve learning in rural schools may be more successful if parental involvement is increased. Administrators have an important role to play in fostering such involvement; they can encourage teachers and other personnel to foster the involvement of their students' parents throughout primary, middle, and high school years (Christenson & Conoley, 1992). Furthermore, schools can work to improve school-parent-child and parent-child communication patterns and support parenting practices, which take into account the students' developmental needs, to increase parental involvement (Keith & Christenson, in press). For example, schools can provide parents with a newsletter of classroom and extra curricular activities in order to promote discussions about "what happened in school this week"; organize information meetings so parents can understand the educational or training requirements for various career options outside of the community; survey parents and various other stakeholder groups on a regular basis to continually re-establish communication links in the community; and establish opportunities for parents to meet to discuss common concerns and issues of parenting in rural communities. Obviously such suggestions are only a small sample of the many ways in which parents can be encouraged to participate more fully in their children's education.

Once implemented, it is important to recognize that an emphasis on parental involvement should not disappear once a child reaches high school. In fact, parental involvement has a lasting effect on children through the tenth grade

and most likely throughout the child's life. Finally, school administrators in rural settings can utilize parental involvement research in the development of interventions designed to improve the learning of individual children. It appears that such interventions may be equally potent in all geographic settings. Inservices and workshops to encourage home-school collaboration would be beneficial for teachers and parents alike.

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Appendix
Composition and Coding of Latent and Measured Variables

Latent Variable	Measured Variable	Composition and Coding
Ethnicity	Ethnic	Student race or ethnicity 1=White, Asian American 0=African-, Hispanic-, Native American
Family Background	Parent Occupation (Higher status used) Parent Education (Higher education level used) Family Income	Respondent occupational status (parent) ^{a, b} Spouse occupational status (parent) ^b Respondent education (parent) Spouse education (parent) 1=Did not finish high school to 6=MD, PhD, etc. Total family income for 1987 (parent) Recoded to the midpoint of categories. Range was 0 (None) to 250,000 (200,000 or more)
Rural vs. Other	Rural vs. Other	0=Urban and Suburban 1=Rural
Previous Achievement	Reading 88 Math 88 Science 88 Social Studies 88	Standardized tests administered in 1988
Parental Involvement	Educational Aspiration (All parental involvement measured variables were weighted so as to be based 50% on parent response and 50% on student response) Parent-Child Communication	Responding parent's educational aspiration for student (parent), 1=less than high school to 8=doctorate. Student's perception of father's and mother's educational aspirations for them (student), 1=less than high school to 6=higher schooling than college. From student file, coded 1=not at all to 3=3 or more times: How often have you discussed with your parents: School activities of interest to you Things studied in class Planning a High School program From parent file, coded 1=not at all to 4=Regularly: How often do you or your spouse/partner talk to your eighth grader about: Experiences in school His/her plans for high school His/her post high school plans
Achievement	Reading 90 Math 90 Science 90 Social Studies 90	Standardized tests (student)

^a“(parent)” means that the item came from the parent file; “(student)” means that the item came from the student file.

^bStudent responses were used if parent responses were missing.