

EFFECTS OF PARENTAL INVOLVEMENT, SOCIO-ECONOMIC STATUS AND FAMILY
STRUCTURE ON STUDENT ABILITY

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Abstract

The relationships between socio-economic status (SES), parental involvement (PI) and student ability have not been elucidated particularly because of the difficulty in finding a suitable sample, in one school system (to control for other contributing variables), of sufficient variance in SES. The primary purpose of this study, then, was to examine the effects of SES and PI (both parent and teacher reported) on student ability in third grade students within one school that exhibits wide variability in SES. A secondary purpose was to compare student ability between different family structure groups. Student ability was assessed using the TCS/2 from which the CSI score was obtained. PI was assessed via a questionnaire adapted from a previously published PI instrument and SES and family structure data were obtained from parent self-report. Frequency distribution of SES was even between all groups from high to low. Family structure was more skewed although the dual parent groups were evenly divided into those of single earner and dual earner status. Results indicated no significant main effects or interaction for SES and PI and no significant correlations between CSI and any of the independent variables. Family structure, however, was a significant determinant of CSI with the children of the dual parent/single earner family demonstrating a higher CSI than those of the dual parent/dual earner. In conclusion, differences in SES and PI appeared to explain little of the variance in student ability as measured by CSI.

Introduction

Many researchers, administrators, parents and teachers are interested in strategies to increase academic achievement (Salerno and Fink, 1992). Interest in quality education extends beyond those directly involved (educators and family) because of the perceived relationship with societal quality. Though there will never be an all-encompassing recipe for success, a great deal of effort is expended evaluating educational technique. While many factors affect academic development, educational professionals concede that the extent of parental involvement during the child's development is a powerful contributor.

Parental involvement (PI) in a child's development may seem an instinctual process, but the degree and nature of this involvement vary greatly from family to family. Furthermore, an evolution in parental socialization values has taken place over the last forty years. Parents in the 1950's and 1960's valued the importance of obedience, which contrasts with parental emphasis on individual decision making and freedom in the 1970's and 1980's (Demo, 1992). Such changes in parenting styles invariably lead to changes in parent-child relationships and family structures today are noticeably different from their earlier counterparts.

Increasing numbers of children living in single-parent homes, stepfamilies, and dual-earner marriages all justify investigations into the resulting effects upon children and parent-child relations (Demo, 1992). For instance, Nock and

Kingston (1988) observed that dual-earner parents spend less time with their children than single-earners. If this is the case, then the increasing number of dual-earner parents may result in more children receiving less time from their parents.)

Achievement and ability are often viewed as interchangeable student metrics. However, in the educational field, these terms possess very distinct meanings. [A child's achievement is an objective measure of educationally relevant skills or knowledge about established subject areas such as reading, spelling, or mathematics. Ability or aptitude is a combination of characteristics, whether native or acquired, that are indicative of an individual's capacity to learn or to develop proficiency in some particular area if appropriate education or training is provided](Harcourt Brace and Company, 1997).

Standardized evaluation of student ability is common in the American educational system. Certain tests have the capability of measuring both student ability and achievement or they can selectively target assessment to a single measure. Educators and psychologists consider these two terms both separately and in combination during evaluations for special or gifted educational programs.

According to Teachman (1996), a child's intellectual ability is the most important predictor of student grades, which constitutes one possible measure of student achievement. [Intellectual ability affects virtually all elements of public and private life, including education,

employment, the family, and civic responsibility.)

"Intellectual ability is implicated, directly and indirectly in the stratification of American society" (Teachman, 1996).

It follows that a person's ability has the potential to predict outcomes that extend past content area grades.

Previous research pairs ability and achievement with such issues as socio-economic status (SES), parental level of education, family size and many other familial factors, including levels of parental involvement, or PI (Teachman, 1996; Reynolds, 1992). Although many school districts, communities, and states are supporting parental involvement programs designed to inform parents about favorable practices (Epstein, 1988), research on PI and its effect on children's achievement and ability has provided mixed results.

The results of PI studies vary much like observed levels and natures of parental participation. Contributing to variations is the fact that targeted subjects have spanned all ages and geographic environments. Studies have been documented using students as young as pre-school and as old as high school seniors (Stevenson and Baker, 1987), with schools located from rural to urban America. Differing opinions have been offered in explanation of the disparity in the results. Scott-Jones (1984) attributes the variations to different definitions of PI. Depending on the study, PI has been defined as behaviors at school, behaviors at home, or combinations of the two. He provides further justification by noting the lack of studies evaluating ranges of parental behavior in school (e.g., attending meetings) and at home

(e.g., reading, cooking) within different populations.

Early developmental influences and intellectual functioning have been examined by studying perinatal factors, however results indicated a minimal or inconclusive relationship (Sattler, 1992). Wilson (1983) investigated the relationship between influences in a child's home environment and mental development at six months of age, 24 months of age, three years of age, and six years of age. Mother's IQ levels predict children's IQ levels at 2 years of age, and home environments predict IQ levels at 3 to 4 years of age.

Other contributing factors have been found to closely relate to a child's mental development, including the father and mother's educational level and socioeconomic status (SES). After investigating relationships between intelligence, family structure, and childhood experience in 6 to 11 year olds, Mercy and Steelman (1982) concluded that factors within the family environment distinctly influence intellectual development. When using 27 elementary schools in western Kentucky, Bulach (1995) found significant relationships between student achievement and school climate, student socio-economic status (SES), PI, and community involvement. Yap (1995) found a significant relationship between home-based PI activities and student performance on norm-referenced tests. Fantuzzo (1995) attributed small gains in math achievement to higher levels of PI in urban at-risk elementary schools. Likewise, in rural America, Keith (1996) found that higher levels of PI improved academic achievement in 8th to 10th graders.

Despite many positive correlations, some researchers noted mixed results within a single study. For example, Sui-Chu and Douglas (1996) investigated the effects of PI upon eighth grade achievement. Results pointed to gains in reading with a negligible effect in mathematics. Similarly, Hong (1995) found PI levels to have positive effects upon homework attitudes, but no effect on homework achievement. Milne (1986) actually found negative performance effects resulting from parental homework assistance. This relationship was attributed to the possibility that low-achieving students require more PI than their high-achieving peers. However, Milne (1986) also found that high levels of parental expectations had positive effects on child achievement.

Reynolds (1992) argued that "although a number of explanations are possible for the inconsistent findings of PI effects, most are likely due to differences among measures of PI, sources of report, and samples." Reynolds' research was designed to study low-income, minority children with learning difficulties, little PI, and minimal financial resources. Reynolds defined PI as "potentially enriching interactions with the child at home or in support of the child at school". PI data were collected from three sources: parental estimation of their own levels of involvement, children's estimations of their parents' level of involvement, and teacher estimation of parental levels of involvement. The corresponding academic data consisted of student achievement scores over a two-year period. Reynolds reported low to

moderate positive correlation between PI and student achievement scores. Of the three sources, the teacher assessment was found to have the highest correlation with student achievement, with parent and student assessments showing much lower correlations. Reynolds concludes that, without considering the source of PI measures, PI was a modest determinant of student achievement in both years of his study, with self-reported surveys providing the highest potential for inaccuracy. Reynolds' design overcame the limitations resulting with self-reporting by providing the additional reports from teachers and children.

Studying different parameters, Bracey (1996) found a positive relationship between SES and PI. He conjectured that parents in low SES households are not lacking in interest but rather in time and energy. Logically, it follows that studies conducted with low SES children should have a smaller amount of PI variance within the sample population. Conclusions such as Bracey's suggest that a diverse target population spanning an extremely wide range of household income would provide substantial variance in the level of not only PI but perhaps its relationship with achievement or ability.

The major purpose of this investigation, then, was to examine the effects of PI and SES on a child's ability (intellectual intelligence). A secondary purpose was to examine relationships between SES, family structure, and sibling size to levels of cognitive ability or levels of PI. In addition, the study examined the relationship between PI

as reported by parents and teachers.

[Methods]

The subjects of this investigation were 64 third grade students from three classrooms in a mid-western, suburban school which was chosen for its unique SES demographics. Although predominantly Caucasian, its students are from families demonstrating a wide range of socio-economic levels. All participants were from the same attendance area. Homes in the school district range in value from less than \$50,000 to over \$1,000,000, with approximately 15% of the students receiving subsidized lunches. Along with the large variety of SES, the sample exhibited apparently varied family structures. All participants volunteered for the study responding to a survey sent to their homes, with no compensation for participation. One additional relevant characteristic of the school is the establishment of many programs designed to promote PI. It features a site-based management structure where school-wide decisions are made by committees consisting of both teachers and parents. In short, the school provides ample opportunity for PI.

Data collection was done using methods similar to those reported by Reynolds (1992). The parents of the seventy-six third-graders targeted for inclusion were mailed questionnaires in the fall of 1997. At the same time, the children were administered the Test of Cognitive Skills, Second Edition (the TCS/2, Macmillan McGraw Hill, 1992). Measures of student ability were taken from the (TCS/2)

administered by the students' classroom teachers in the fall of 1997. "The TCS/2 is a cognitive abilities test which comprises four sub-tests designed to assess the academic aptitude of students. The sub-tests are intended to measure selected verbal, nonverbal, and memory abilities that are important to success in an educational program"

(Macmillan/McGraw-Hill 1992). Most cognitive abilities cannot be measured directly but are implied by testing behaviors that reflect those abilities. The TCS/2 is designed to measure cognitive skills (ability) rather than specific content area skills (achievement). The Cognitive Skills Index (CSI) is the resulting measure, and is considered an age-based standard score that describes an individual's performance across the entire TCS/2. The score predicts a student's overall cognitive ability, or academic aptitude, relative to students of similar chronological age without regard to grade placement. The CSI is a function of a student's scale score adjusted by age, and has the same statistical properties as the traditional Intelligence Quotient (IQ) (Macmillan, McGraw-Hill, 1992). For the purposes of this study, the CSI is assumed to accurately represent student ability.

Adapted from Reynolds (1992), the parental survey provided six items describing PI behaviors with one pertaining to home involvement (only one discussing the child's progress) and the rest pertaining to school involvement (e.g., communications with school personnel). Parents reported numerical data for each question ranging

from scores of one to seven, with (1) signifying that the behavior is never performed and (7), signifying an everyday occurrence. With six questions, therefore, overall PI can be indicated as a composite score ranging from 6 to 42. Additional information also requested in the parental survey included sibling size, family structure, and the total family adjusted gross income.

Because economic status and standardized test scores are sensitive, personal information, a coding system to ensure strict confidentiality was used. A random number was noted at the top of all surveys with a lone master list kept by a third party (school counselor). As surveys were returned, the school counselor provided the researcher with individual CSI scores by random subject number. The test scores were then correlated with the survey data according to these numbers, without referral to the master list. Likewise, the counselor was never affiliated with any survey data. Second mailings were sent to the sample within two weeks proceeding the first mailing. Sixty-four of seventy-six potential subjects returned the survey.

The teachers were asked to complete a three item questionnaire regarding observed PI patterns exhibited by each family. Two items report the observed amount of school involvement, while one indicates the perceived amount of home involvement. Like the parental survey, the possible answers are organized in ranges, with available responses ranging from (1), never to (7), everyday. Therefore, summations

from the teacher survey can result in scores ranging from three to twenty-one. The questions included in the parental survey and the teacher survey were similar so that the degree of similarity between the responses could be measured.

While PI is the central factor in this study, other variables, all parent-reported, were assessed. *Sibling Size* was the number of brothers and sisters living with that particular child. *Family Structure* was one of four possible choices: single parent/single earner, single parent/single earner plus child support, dual parent/dual earner, and dual parent/single earner. *SES* was one of seven annual income brackets: 0-\$20,000; \$20,000-\$40,000; \$40,000-\$60,000; \$60,000-\$80,000; \$80,000-\$100,000; and over \$100,000.

Analysis

Three separate phases of analysis were conducted to examine related questions dealing with the issue of parental involvement and student ability. In phase one, a simple correlation matrix was computed to examine relationships between some key independent variables (SES, sibling size, PI and teacher PI) and the key dependent variable, CSI (the indicator of student ability). For phase two, a two-way ANOVA was conducted using a multiple regression model (because the independent variables were at least interval data) to examine the possibility of an effect of SES and PI on CSI. Main effects and interactions were considered at the alpha = 0.05 level. Scatterplots were also examined for the possibility of non-linear model fit. For phase three, a one-

way ANOVA was conducted to examine the effect of family structure on CSI. Family structure exhibited four levels: single parent/single earner (SP/SE), single parent/single earner plus child support (SP/SE + CS), dual parent/dual earner (DP/DE) and dual parent/single earner (DP/SE). In the event of a significant F ($P < 0.05$), a least squared differences post-hoc test was used to locate significant paired differences.

Results

A critical element for this investigation was to provide a sample with a large SES variance so that possible SES effects could be investigated (Bracey, 1996). As previously mentioned, this school district was specifically chosen because of its reported wide range of income levels among students' families. Cell sizes for each of the four levels of SES supported this contention with values of $n = 12, 11, 10, 7,$ and 15 for the lowest to highest SES groups, respectively. The family structure demographic, however, showed a much more skewed distribution as cell sizes ranged as: $n = 3, 4, 23,$ and 28 for the SP/SE, SP/SE + CS, DP/SE and DP/DE groups, respectively. This made further analysis between the dual parent groups the only suitable comparison. This does underscore, however, the relatively large number of intact families within this school district. Sibling size exhibited a rather small range between zero and three for all but two respondents. This narrow range likely contributed to a failure to find a significant effect for this variable in

later correlational analyses.

PI scores, shown in Table 1, are displayed by item as well as by teacher versus parent reported. As mentioned previously, all scores except totals, are based on a one - to - seven scale so that a score of seven represents a high degree of perceived PI.

Results of statistical analyses follow by phase. In phase one, no significant correlations were found between any of the independent variables (SES, PI, and sibling size) and the dependent variable of CSI score. This suggests that little possibility exists for these independent variables exhibiting a meaningful cause/effect relationship on student ability as measured by the CSI in this sample. A small to modest correlation ($r = 0.33$, $p < 0.05$) was found, however, between the teacher-PI and PI, suggesting that there exists some agreement between teacher and parent ratings for parental involvement. Another modest correlation ($r = 0.28$, $p < 0.05$) was found between sibling size and one questionnaire item, that of school meeting attendance, indicating that parents with more children attend more meetings. This is not surprising due to the fact that a parent with multiple children simply has more meetings to attend. This correlation was not deemed either numerically significant (sibling size explained only 8% of the variance in meeting attendance score) nor was it considered practically significant.

In phase two, multiple regression analysis of the effects of SES and PI on CSI (ability) yielded no significant main effects for SES or PI and no significant interaction (SES x PI). In fact, the P values were far from significant suggesting that not even a trend should be discussed. Because of the possibility that some non-linear model might elicit a better fit than the traditional linear one used for this regression model, the scatterplot of the SES vs. CSI scatterplot was examine for other notable shapes but none was found.

In phase three, a significant main effect for family structure was found suggesting that this variable may be a determinant of CSI. Subsequent post-hoc analysis using the least squared difference test revealed that the DP/SE or dual parent/single earner group scored significantly higher (P < 0.05) than all other groups, to include DP/DE, or dual parent/dual earner. The only meaningful comparison, however, was determined to be between the dual parent groups because of the aforementioned cell size deficiencies for the single parent groups. The Cohen's delta effect size (ES) of the dual parent group comparison revealed the practical difference to be modest (ES = 0.63), suggesting that, within the population represented by this school district, children of dual parent families with a single earner would be expected to exhibit higher CSI scores than those of dual parents but dual earners.)

Discussion

The purpose of this study was to examine the influence of SES and PI upon a child's intellectual ability. Five major relationships were included in this research: PI levels and student ability, SES and ability, sibling size and ability, family structure and ability, and teacher vs. parental PI. These variables were chosen for the current study because previous research has indicated their influence upon student development albeit not in a sample with a large SES variance. The large amount of past research focusing on PI reflects the perception of its presumably positive value in student achievement/ability. This may be the case, but the findings of the present study indicate no significant relationships between PI and student ability, regardless of PI data sources (teacher or parent).

There are several possible explanations for these results. First of all, data collected through surveys requiring a subject self-evaluation can be biased. All researchers attempt to attain the most precise data, however, people may have cause to misrepresent themselves. For example, a parent may desire to increase their involvement with their child, but financial burdens force them to maintain employment thereby decreasing their levels of parental involvement despite other intentions. Another parent may have little basis for subjectivity because they have little insight into the parental involvement patterns of their peers. A third parent may have recently implemented a

regimen of heightened involvement, and although the child could not have benefited from the new situation, the survey would indicate a tradition of involvement. Regardless, human nature may bias results by steering responses toward those seeming desirable rather than those that are objectively obtained. Furthermore, subjects may question the confidentiality of the data collection, and become inspired to exaggerate responses toward a desired perception. In addition, questionnaires, no matter how detailed, have the potential to be misinterpreted by subjects. Parents view survey items according to their own experiences (Epstein and Becker, 1982). Therefore, given that each subject is the product of a different family and different academic experiences, there is potential for contrasting parental interpretations for the same questionnaire item. Regarding the question, "How often do you discuss your child's progress?" one parent may assume this to be a passing question during dinner, while another parent considers that description to entail sitting down with his/her child and carefully reviewing the child's school work. Finally, another subject may interpret this activity to include perusing a child's work and helping to correct any errors.

Insignificant relationships between PI and student ability may also be propagated by parental perceptions of childhood ability. Raising a child with high ability and high grades may not require a high degree of PI. The child would therefore achieve a high CSI score while the parent reported low PI behaviors. Indeed, some subjects seemed to

demonstrate this very phenomenon.

A key result in this study is the significant relationship found to exist between family structure and ability. Specifically the DP/SE group scored higher ($ES = 0.63$) than the DP/DE group. This effect size indicates a practical difference, the cause of which may be multifactorial. This result gains importance due to the fact that PI, whether parent or teacher reported, did not seem to play an intervening role.

Past research predicts that the gains in ability may be a result of increased early childhood PI levels. This is supported directly by examining the family structure of the child during the pre-school years. Families with a homemaker traditionally report higher levels of PI with young children. Specifically, Nock and Kingston report that mothers with jobs spend about a quarter hour less per day playing with or educating their children and 39 minutes less per day in direct care for their children (1988). Bloom (1964) reports that early environmental influences may be lasting in their effect on a child's cognitive ability. Bradley and Caldwell add further support by reporting a relationship between maternal responsiveness and children's intelligence during the preschool years. The degree to which subjects in the DP/SE groups benefited differentially from early childhood PI is not known but could certainly be an intervening factor.

If the influence of family structure is more profound during a child's early developmental years, then future research might be based on a longitudinal design with DP/SE

and DP/DE family structure levels that repeatedly explores PI levels experienced by a control group through a child's early developmental stage into elementary school. Simultaneously, investigations could examine the child's ability during each evaluation of PI levels. The conclusions drawn could indicate a period after which ability is no longer correlated with PI. A possible explanation of the predicted decreased PI is that a full-time parent may interact with the child more frequently when they are young, but level of involvement decreases toward that displayed in DP/DE families as the child ages. Nonetheless, a trend shows that children in households with dual earning parents score lower on ability tests. Future investigations might also incorporate more intricate measures of PI. Consideration should be given to the description of PI behaviors so that subjects interpret questionnaire items similarly.

Finally, this study found only a modest association between reported levels of PI between teachers and parents. This may be due to a lack of accessibility. Although communication is an important component of parent /teacher relations, lack of time and differing schedules make it difficult for teachers and parents to interact other than during scheduled meetings (Epstein & Becker). Further disparities could be due to the fact that data collection occurred in the fall of the school year, when teachers are likely to be less familiar with their students and their families. Teachers' perceptions of parents and families can change greatly over a nine month school year, so there is a

potential to misjudge a family at the beginning of the year. Conversely, many school events such as Open House and Parent/Teacher Conferences traditionally occur early in the school year, creating potentially inflated PI reports. Unfortunately, teachers may have used only first impressions in their survey responses. Future research on the associations between parental and teacher estimations of involvement would be most accurate in late spring when conclusions can be based on a full school year of experience.

In conclusion, this study failed to find significant relationships between student ability and: sibling size, parental involvement, socio-economic status, nor did it indicate a potential interactive effect of socio-economic status and parental involvement on student ability. Family structure, however, was found to be a significant determinant of student ability specifically between the dual parent groups. Children of dual parents but a single earner were found to have higher student ability (as indicated by CSI score) than students of dual parents but dual earners. The mechanisms for this difference are not clearly known but are most likely multi-factorial and provide a foundation for future research.

Table 1. Descriptive Statistics

Variable	Mean	SD
<u>Parent Measures</u>		
discuss child's progress	6.2	.92
communicate with school	3.7	1.55
participate in school activities	3.34	1.75
help in child's classroom	1.97	1.06
talk with child's teacher	2.69	.98
attend parent meetings	2.44	.98
TOTAL PI MEASURES	20.52	4.80
<u>Teacher Measures</u>		
participate in school activities	2.39	1.28
communicate with school	3.75	1.34
provide learning experiences	4.30	1.66
TOTAL PI MEASURES	10.44	3.41

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