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The Springfield Schools Panel Study:
Report to the Springfield School District

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Prepared by
Jean Stockard, PhD
Associate Professor
Department of Sociology
University of Oregon
Eugene, Oregon

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During the academic year 1980-81, Jeanne McGee, an assistant professor in the Department of Sociology at the University of Oregon, gathered data in the Springfield school district on the occupational and educational attitudes and aspirations of fourth grade students and their mothers. Information was gathered through an hour long interview with each child, a questionnaire given to the children in their classrooms, and a questionnaire mailed to each mother. In addition, information was taken from district records on the child's attendance and achievement in various areas, and an essay the children had written on their occupational choices was examined.

Six hundred and fifty fourth graders participated in the study, about 85% of the students enrolled. Three hundred seventy mothers completed the mailed questionnaire.

Dr. McGee moved from the Eugene area in the spring of 1982. She, unfortunately, entered a job outside of academe and was unable to pursue the analysis of the data. The Center for the Study of Women in Society at the University of Oregon was aware of the project (and had provided a small amount of initial funding for it) and asked Dr. McGee if she would be willing to allow scholars at the University to continue to work with the data and develop the project further. She agreed to this proposal and came to Eugene in June of 1984 to explain the project to staff members. The

raw data and supporting materials were also shipped back to Eugene in the summer. It was agreed that Jean Stockard, the author of this report and an associate professor in the Department of Sociology, would monitor further analysis of the data and direct the project if the district allowed more data to be gathered.

The present report is designed to fulfill the obligations originally entailed by Dr. McGee to provide information on the results of the study to the school district, teachers and parents. A one-page summary of this report and the relevant tables and figures are attached. This report focuses on the mothers' views of educational programs, the students' views of occupations, and influences on the children's academic achievement. Implications of these results are briefly discussed in each section. The report ends with a discussion of possibilities of further analysis and data gathering.

Mothers' Views of Educational Programs

In the summer of 1981 a 10 page questionnaire was mailed to mothers who had consented to have their fourth graders participate in the study. The questionnaire included a form asking permission for researchers to examine the essay the children had written and a series of questions focusing on the mothers' educational and occupational aspirations for their children, their own occupational and

educational backgrounds, as well as their views of the importance of various subject areas. Different forms of the questionnaire were sent to mothers of girls and mothers of boys, some questions referring to "your son" or "your daughter" depending on the sex of the child. In cases where a mother had two children enrolled in a grade, the questionnaire was directed toward only one child, the choice determined by a flip of a coin and indicated in the cover letter and first page of the questionnaire. Information is only reported here on the questions regarding school subjects.

The mothers were asked, "In your opinion, how important is it for children your son's [or daughter's] age to master the following school subjects?" A list of 9 subjects followed with these response choices: "very important to master," "fairly important to master," "not very important to master," and "not important at all." The subjects listed and a summary of the results are given in Figure One. It is clear from these results that the mothers saw reading as the most important subject for fourth grade students (97% saying it was very important for children to master the subject), followed closely by math and spelling, each with 90% of the mothers seeing the area as very important. The only other subject area which more than 80% of the mothers saw as very important was language arts. Less than half of the mothers said that science was important, although mothers who had

attended at least some college (43 % of the sample), were more likely to see the subject as important (chi-square=19.7; df=3; p=.0002).¹ Less than a third of the mothers said that social studies or physical education were very important and less than 15% said that art and music was very important. There was again, however, a difference in the responses of the mothers with some college education and those without. The more highly educated mothers were more likely to say that music was important (chi-square=11.4; df=3; p=.01).

The mothers were then asked their opinions about whether their daughters' or sons' fourth grade class should have spent more time or less time on certain school subjects. The list used in the previous set of questions was repeated along with the response of "none," and respondents were first asked to check the areas which they thought should have received more time and then the areas which should have received less time. The results from the first of these questions are summarized in Figure Two.

The results were similar to those reported in Figure One. More than one-third of the mothers thought the class should have spent more time on reading, math, and spelling, followed by 30% noting language (English), 20% noting more time needed for science, 15% for social studies and less than 10% of the mothers saying that more time should have been spent on art, p.e., or music. Thirty-four percent of

the mothers said that no subjects needed to have more time devoted to them. There was again a difference in the responses of mothers who had attended college and those who had not, with the mothers with no higher education more likely to say that more time should have been spent on reading (chi-square =6.07; df=1; p=.01).

The responses regarding subjects on which less time should have been spent paralleled the results reported immediately above. Over two-thirds of the respondents said that no subjects should have received less time. Five percent or fewer of the respondents said that less time should have been spent on social studies, reading, language (English), science, math, or spelling; although 18% said that less time should have been spent on art, 13% voted for less time for p.e., and 15% said that less time should have been spent on music. Differences between mothers of different educational backgrounds were notable. Mothers with no college education were more likely to want fewer minutes devoted to art (chi-square=6.0; df=1; p=.01), science (chi-square=4.7; df=1; p=.03), and music (chi-square=8.0; df=1; p=.005).

Undoubtedly the mothers' concern with reading, math and spelling achievement reflects their belief that children should master the basic skills needed for later achievement. There seemed to be a good deal of unanimity on this score. The various differences between mothers with different

levels of educational attainment may reflect different values regarding the importance of various subject areas. They may also simply reflect different concerns about their children's achievement. Given the moderately high association between socio-economic background and academic achievement, it is reasonable to expect that children of mothers with some college education would be less likely to be experiencing difficulties in the basic skills areas and thus would have more time to focus on areas that others would describe as "frills." Whatever the reasons underlying these differences, policy makers in the school district might want to be cognizant both of the parents' attitudes and the variations between parents of different social status backgrounds.

Finally, the mothers were asked about a number of "job skill programs available in the local high schools." They were asked to mark the ones they would like to have their son or daughter learn during high school. The results for these questions are summarized in Figure 3. It appears that there is strong support for vocational education, with only 4% of the mothers saying that they would not want their sons or daughters to learn any of the listed job skills. The most popular job skill programs were accounting, health occupations, marketing or sales work, electrical, and mechanics training, with over one-half of the mothers checking these options. Forty-six percent of the mothers

checked clerical and secretarial training, 35% checked construction work, 30% marked agriculture, and 28% marked metal working. Food services received the fewest choices with only 11% marking this choice.

Because separate questionnaires were sent to mothers of boys and mothers of girls, this question, in contrast to the previous ones, was influenced by the gender of the child, and a number of differences appeared in the responses of mothers of boys and mothers of girls. Mothers of sons were more likely than mothers of daughters to select training in construction (chi-square=56.9; df=1; $p<.0001$), electrical work (chi-square=90.9; df=1, $p<.0001$), mechanics (chi-square=105.5, df=1, $p<.0001$), and metal working (chi-square=66.9; df=1; $p=.001$), but less likely to mark food services (chi-square=10.6; df=1; $p=.001$), clerical-secretarial (chi-square=92.8, df=1, $p<.0001$), and health occupations (chi-square=5.4; df=1; $p=.02$). These choices generally parallel the sex-typed nature of the occupational world and the actual jobs which males and females tend to enter.

Given that people of different social class backgrounds often have varying occupational aspirations for their children, it is possible that mothers with different levels of education would vary in their job choices for their children, too. No social status differences appeared in the endorsement of training for health occupations, accounting,

marketing and sales, electrical work, agriculture, mechanics, or metal working. Mothers without any college education, however, were more likely to endorse training in food service work (chi-square=3.9; df=1, p=.05), clerical occupations (chi-square=5.1; df=1; p=.02), and construction work (chi-square=5.0; df=1; p=.03) for their sons and daughters. While more definitive interpretations of these results would require examining the influence of the parents' occupations as well as their education, these results suggest that the influence of mothers' educational level on their preferences for vocational training is substantially smaller than the influence of their children's gender.

Children's Perceptions of Occupations

A central part of the hour long interview with each child was assessing their perceptions of a group of twenty-two occupations. The procedure involved a series of cards developed by Dr. McGee in other work and bearing sketches of people in various jobs. At various points in the interview the children were asked to sort the cards into a series of five piles reflecting a given dimension.

Four decks of cards were used in the study. In two of these decks the sex of the job occupant was constant (either male or female) and in the other two decks the sex of the job occupants was randomly assigned, but switched from one

deck to the other. That is, with only one exception, jobs portrayed by men in one of the mixed decks were portrayed by women in the other deck and vice versa. The exception involved nursing. It proved impossible to draw a male nurse that was reliably identified by the children, and so that occupation was always portrayed by a female figure. The deck with mixed-sex job occupants which was used in a particular interview was randomly assigned, and the order in which the cards were presented to the children was also randomized. Examples of the pictures used are in Figure Four.

A practice run was used to assess the children's understanding of the sorting procedure. The children were given a stack of cards with names of different kinds of food and were asked to sort them into five boxes which indicated how much they liked each food. If a child could not do this practice sort, he or she was not asked to do the other ones involving the occupations.

The children who successfully completed the practice sorts were shown a deck of cards in which all of the portrayed job holders were of their own sex. The interviewers gave the following instructions to each child: "Now I have another set of cards for you to sort into different stacks. These cards show people working at different jobs. I want you to look at each job and think about how much you would like or dislike having that job

yourself when you're grown up. Then put the card into the box that matches how you feel." The child was reminded that the task was not a test and there were no right or wrong answers. As each card was presented for the first time the child was asked to tell what occupation it represented. Any wrong answers were noted and those cards were omitted from the later sorts for that child.

At later points in the interview the children were asked to sort the cards in response to other queries. The decks with mixed sex job occupants were used in all of these sorts. The first assessed the difficulty of the job with the child being given the following instructions. "Now I want to show you some pictures of jobs again. This time, would you sort them into different boxes according to how hard or easy you think it would be for somebody to work at that job. I don't mean how hard or easy it would be for you personally -- just how hard or easy the job is, in general."

The second measured the "importance of the job with instructions to "think about how important each job is to people in the community, and how much others admire or respect people who work at that job....Please sort the jobs into different boxes according to how important you think the job is to people in the community."

The third sort was designed to measure the children's views of hierarchies within the work place and the authority which various job holders hold over others. The

instructions were to sort the cards "into different boxes, depending on whether people who work at each job tell other people what to do as part of doing their job." This is referred to as the "bossing dimension."

Finally, the children were asked about the financial rewards that the workers received. They were given the following instructions: "This time, put [the cards] in different boxes according to how much money you think a person makes for doing the job. Just make your best guess about how much money." This is referred to below as the "money dimension."

The results from these questions are summarized in Tables 1 through 3. For each dimension studied the average ranking or score assigned to each job by the students is reported both for the total group and for males and females.² Cases in which the rankings for an individual job differ significantly between males and females are noted,³ and the overall correlation between the rank orders assigned to the group of jobs by the females and the rank order assigned by the males is given. These correlations essentially tell how similar or dissimilar the rankings are. A value of +1.0 indicates a perfect correspondence, 0 indicates no correspondence at all, and -1.0 indicates a perfectly negative or opposite ranking.

The left hand column of Table 1 shows the children's rankings on the "bossing" dimension. The five jobs rated

highest on the dimension were judge, police officer, high school teacher, air traffic controller, and surgeon. Of these jobs, only surgeon would generally be seen by adults as involving a great deal of work-place authority over others within a structured hierarchy. The other occupations involve authority over others, such as criminals, citizens, students, or airplane pilots, but not necessarily authority over co-workers. The four lowest rated jobs on this dimension were artist, dancer, farmer, and grocery clerk. All of these are relatively solitary occupations or, in the case of grocery clerk, and generally involve only routinized interactions with others. It appears then, that the children were aware of the nature of job activities, although they may not have been aware of the extent of hierarchical steps in the work place. This may result from the wording of the question. Comments the children made in the interviews seemed to indicate that they often saw "telling others what to do" as a negative trait in interpersonal interactions and did not necessarily associate it with hierarchies within the workplace. Given this problem the results with this questions should probably be interpreted cautiously.

The boys' and girls' rankings of the occupations on the "bossing" dimension were virtually identical, as indicated by the very high rank order correlation. There were also

no sex differences in the children's rankings of individual occupations on this dimension.

The right hand side of Table 1 gives the results on the rankings on the "difficulty dimension." For the total group the jobs ranked hardest were surgeon, scientist, firefighter, pilot, and air traffic controller. Not all of these jobs require extensive preparation or training, but they would probably all be viewed as demanding. They are also somewhat unlikely to part of the every-day experiences of the students.

The jobs ranked easiest were fast food worker, grocery clerk, librarian, nursery school teacher, and truck driver. In contrast to the jobs rated hardest, these are occupations which may more often be seen by students in their everyday lives and, perhaps for this reason were seen as being less difficult.

The rank order correlation indicates that the boys and girls ranked the occupations in a very similar manner on this dimension. There were a few differences, however, in the ratings they assigned to individual occupations. Boys saw being a farmer, nursery school teacher, and librarian as harder than girls did. Girls ranked tv repairperson, hair dresser, and truck driver as harder.

The left hand side of Table 2 shows the rankings of occupations on the importance dimension. The jobs ranked as most important by the total group were firefighter, police

officer, surgeon, air traffic controller, nurse, and judge. Each of these occupations is connected in some way with the health and safety of the public. The jobs rated least important were dancer, artist, hairdresser, truck driver, and fast food worker. Each of these jobs could be perceived as connected with luxuries of one type or another. Perhaps the children perceive jobs as more important if they contribute to what are seen as necessities for social life, an understandable response given the wording of the question.

As with the two dimensions discussed above, the overall rankings of the jobs on the importance dimension were quite similar for males and females. However, a few sex differences appeared, with boys ranking air traffic controller, scientist, pilot, and truck driver as more important than girls did and with girls ranking nurse, grocery clerk, and dancer as more important than boys. Each of these differences corresponds to the sex differences in preferences noted below. Members of each sex group were more likely to see their own job preferences as more important, although this had relatively little effect on their views of the relative importance of the entire set of occupations.

The right hand side of Table 2 shows the rankings on the money dimension. The jobs rated highest on this dimension were surgeon, judge, police officer, scientist,

and fire fighter. Those rated lowest on the dimension were farmer, dancer, librarian, nursery school teacher, and fast food worker. In general, these distinctions correspond to actual differences in pay and suggest that the children understand the system of remuneration in our society.

The rank order correlation for this dimension was again quite large, indicating that boys and girls ranked the entire set of occupations similarly. However, there were some significant differences in the ranks given to individual occupations. Boys perceived scientists, air traffic controllers, and pilots as receiving higher salaries than girls did, while girls perceived nurses, high school teachers, grocery clerks, hair dressers, and nursery school teachers as receiving more pay than boys did. As with the importance dimension, these differences appear to parallel the sex differences in preferences, with each gender group seeing their own preferred occupations as receiving more pay than the other gender group did.

Table 3 shows the results of the rankings on the preference dimension. In contrast to the results with the other dimensions, there were large differences between the sex groups on their rankings on this dimension, with essentially no similarity in the overall rankings. The most preferred occupations for the boys were scientist, police officer, artist, farmer, carpenter, and architect. The jobs most preferred by the girls were nursery school teacher,

high school teacher, farmer, artist, secretary, and grocery clerk. The only jobs ranked high by both groups were farmer and artist, probably both reflecting favorite leisure pursuits and somewhat romantic ideas of the future. Girls were more likely than boys to prefer the job of farmer, and the only job without a significant difference in the rankings of the sex groups was that of artist.

The least preferred jobs for boys were dancer, hairdresser, secretary, nursery school teacher, and judge. The least preferred jobs for girls were truck driver, tv repair person, firefighter, pilot, and judge. The only job that both boys and girls rated low was judge, although boys were more likely than girls to prefer that job. Notably enough, the other jobs rated low by each sex group were those which were much more likely to be preferred by the other and which are strongly sex typed in the adult occupational world. In general, the preferences of boys and girls in this sample appeared to parallel the sex-typed nature of the adult occupational world.

Academic Achievement

A major concern of schools is enhancing the achievement of students. The final part of this report of the results focuses on an analysis of influences on the students' achievement in reading, mathematics, and language. The model used here parallels that commonly found in the "educational

production" literature which tries to define a set of "inputs" such as those related to students' family background, attitudes, and aspirations, and then asks how these "inputs" influence the "output" of achievement. The statistical technique of multiple regression is used to assess the relative or independent influence of each of the "input" or independent variables on achievement. The analyses are reported separately for reading, mathematics, and language achievement.

Table 4 gives descriptive statistics for the variables used in the analysis. The independent variables are those which other literature in the field has suggested have an influence on student achievement. This particular data set, however, is somewhat unique in the extent of information available on the family background, family support, future aspirations, and attitudes toward learning for children of such a young age. For these reasons, the results may potentially be quite important.

As noted above the dependent variables are measures of the children's achievement in reading, mathematics, and language. Each of these comes from the overall score on the relevant subtests of the California Achievement Test, given to the children in the fourth grade. The reading score includes subtests of vocabulary and comprehension, the mathematics score is composed of results on computation and

concepts and applications subtests and the language score comprises subtests of mechanics and expression.

Four general types of independent variables regarding the children were used in the model: 1) a measure of academic aptitude; 2) the child's attitudes, extra-school behaviors, and aspirations; 3) demographic variables; and 4) the family environment.

A separate measure of academic aptitude for reading mathematics and language is provided in the results from the California Achievement Test. This is actual an "anticipated achievement score" and is derived from taking into account the child's academic aptitude, age, grade, and sex through a multivariate statistical procedure. The anticipated score computed for each subject area is used in each analysis. It should be noted that on the average the students in the district had slightly higher actual achievement scores than were anticipated.

On the questionnaire administered in the classrooms the students were asked their views about a number of subject areas. These included questions about how much they liked the subject, how hard they thought it was, how important they thought it was, and whether it was their "best subject." Analyses of the intercorrelations among these items indicated that all four were at least moderately correlated with each other when the subject matter was reading. The responses regarding reading were summated and

a scaled score indicating general attitude toward reading was derived. With the questions regarding mathematics and language the item regarding the importance of the subject was not highly correlated with the others. Thus that item was not included in the general summated scale measuring attitudes, but was entered separately.

Three separate items asked about the students' attitudes toward school, as opposed to specific subjects. These items involved how happy the children were to return to school after vacation, the importance of getting a good report card, and how they felt if they did not do as well in school as they could. These items were not highly correlated with each other. Thus no scale score could be computed, and each was entered separately into the regression equations.

A standard measure of self-esteem, the Rosenberg scale, was used. On this scale a higher score indicates lower self esteem. In addition, a measure which taps the children's perceptions of themselves as cooperative, helpful people was used. Some literature suggests that these traits are part of a school climate that promotes learning. On this scale a higher score indicates a higher self-rating of cooperativeness.

Two questions on the children's questionnaire asked about their educational expectations and educational

aspirations, whether they wanted to go to college and whether they thought they would actually go.

Finally, there were two measures of how the children used their leisure time: the amount of time spent viewing television and the amount of time spent reading. The scoring used on these two variables should be noted: A higher score on the television viewing variable indicates greater watching of television, a higher score on the reading variable indicates less leisure time spent in reading.

Only two demographic variables were used: the child's gender and the child's social class background. Since the children's gender was included in the computation of the anticipated achievement score, any effect of this variable would have to be in addition to that which is commonly found in such analyses.⁴ Because of limitations on the data currently available for analysis the measure of social class came from the mother's questionnaire and was simply the mother's educational level. Because a fair proportion of the mothers did not return their questionnaires some type of provision needed to be made for missing values and it was decided to substitute the average mother's educational level in each school for the missing value code for students within a given school.⁵

The measures of the family environment came from the children's interview, the mother's questionnaire, and the children's questionnaire. They included a report of how

often the parents talked with the children about school and helped with school work, combined into a scale reflecting parental involvement with the schooling of the child; a dichotomous variable indicating whether the children lived with their mother and father or in some other type of family relationship; the mother's educational expectations for her children, and how many schools the children had attended.⁶

Table 5 gives the zero-order correlations between the independent variables and each dependent measure. It is clear that the highest correlate of achievement was the anticipated score. The correlations were not overwhelmingly high, however, accounting for 28% of the variation in mathematics achievement, 31% of the variation in language achievement, and 46% of the variation in reading achievement when no other variables were included as control variables.

Of the various attitudinal measures, greater self esteem, higher educational aspirations and expectations, and more leisure time reading were all highly associated with higher reading scores. Greater television viewing had a somewhat slighter negative effect, and a more favorable attitude toward school also had a slight positive effect. A more favorable attitude toward mathematics, greater self esteem, and higher educational aspirations and expectations all influenced higher mathematics achievement. A more favorable attitude toward school in general, less television viewing, and more leisure-time reading all had a somewhat

smaller influence. With the measure of language achievement, views on the importance of language, self esteem, educational aspirations and expectations and greater leisure-time reading were all associated with higher achievement. Attitudes toward language and amount of television viewing both had somewhat smaller effects.

Of the demographic variables, gender had little or no effect, but mother's educational level had a strong association with the measures of achievement, most notably with reading and, to a slightly lesser degree, with language achievement.

The four measures of parental involvement also have notable correlations with the measures of achievement. Both the measures of reading and mathematics achievement are strongly associated with the mother's educational expectations and shows a somewhat lower association with the child attending fewer schools and coming from a family with both the mother and father present. The measure of language achievement is strongly associated with the mother's educational expectations and the number of schools attended, but is not significantly associated with the presence of both parents in the home.

A number of the variables listed as independent variables above are actually associated with each other. For instance, children from homes with more highly educated mothers tend to have higher anticipated achievement scores,

higher educational aspirations and expectations, and more often read books during their leisure time. Mothers with more higher education are also more likely to have higher educational aspirations for their children. Children from families with both the mothers and fathers present have usually attended fewer schools during their four years of education. Students with greater self esteem tend to have more favorable attitudes toward subjects, to have higher educational expectations, to see themselves as more cooperative and to have mothers with higher educational aspirations for them.

Because of these intercorrelations the data presented in Table 5 and discussed above may misrepresent the actual influence of each of the independent variables on achievement. To counteract this problem researchers typically use multivariate analyses which statistically remove the joint influence of variables and enable us to see the independent or individual influence of each of the variables which are seen as possible causal factors. We turn now to the results of such a multivariate analysis.

Table 6 gives the results of three multiple regression analyses using each of the measures of achievement as dependent variables. The R^2 value at the bottom of each column in the table tells the proportion of total variation in the dependent variable which is explained by the entire set of independent variables. Clearly much more variation

is explained in reading achievement than in the other measures. Over half of the variation in reading achievement is explained by these variables, but only about 40% of the variation in language achievement, and 35% of the variation in mathematics achievement. Each of these values, however, is sufficiently large to warrant close examination of the results.

The values within each column are standardized regression coefficients and are comparable to the zero-order correlation coefficients given in Table 5. They indicate the influence of a given independent variable on the measure of achievement. In this table the standardized regression coefficients are always smaller than the zero-order correlations, indicating that a good deal of the influence of each variable on achievement is accounted for by intercorrelations with other causal variables.

The measure of academic aptitude, the anticipated score, retains the strongest influence on the measures of achievement, having the strongest influence on reading achievement.

Of the attitudinal variables, self esteem, educational expectations, and the amount of television viewing and leisure time reading retain important influences on reading achievement. With mathematics achievement, only general attitude toward the subject and self esteem retain an important effect. With language achievement views of the

importance of the subject and self esteem both have an important effect.

Of the demographic variables only mother's educational level has an effect and this is significant only with the measure of reading achievement.

With the various measures of the family environment parental involvement is the only one to retain an important influence and this appears only with the analyses of mathematics and language achievement.

In general, these results suggest that students with higher reading achievement scores tend to have higher aptitude for the subject, higher levels of self esteem, higher educational expectations, watch television less often than their classmates, read more often during their leisure time, and have more highly educated mothers. Students with higher mathematics achievement tend to have greater aptitude for the subject, a more favorable attitude toward the subject, higher self esteem, and less parental involvement with their school work. Students with higher achievement scores in language tend also to have greater aptitude for the subject, have higher self esteem, see language as less important, and report less parental involvement with their school work.

Most of these results are in the expected direction. The two exceptions involve the variable measuring parental involvement with the children's school work and the measure

of how important the subject of language is perceived to be. The measure of parental involvement includes both how often the child talks with other family members about school and how much the parents help the child with school work. It could indeed be the case that students experiencing more difficulty with a subject would be more likely both to talk with their parents about school and to more often receive help. Reasons for those who see language as less important to have higher achievement are not as apparent. It should be remembered that there was relatively little variation on this measure and thus these results should be interpreted cautiously.

In many ways, the analysis reported above is overly simplistic. A number of the variables used as predictors or independent variables may actually be the result of student achievement rather than the cause. For instance, students may develop higher self esteem and more favorable attitudes toward school in general and toward particular subjects as a result of doing well in school. Using the anticipated achievement score as an independent variable may also mask some of the actual, and substantively important, influences of family and school related variables on achievement. For these reasons, a second set of analyses were conducted omitting the students' self-esteem, general attitude toward school (the measure of being happy to go back after vacation), attitude toward the subjects, and anticipated

achievement scores.⁷ The results of this analysis are summarized in Table 7.

The R^2 values indicate that substantially less variation is explained in these analyses than in those reported in Table 6, with around one-fifth of the variation in reading and language achievement and only 12% of the variation in mathematics accounted for by the independent variables. The results with reading achievement are similar to those reported above except that parental involvement with the child's schooling and the mother's educational aspirations both appear as important influences. The influences on mathematics achievement are also like those reported above with the addition of the number of schools attended as an important predictor, with students who have attended fewer schools having greater achievement. The results with language achievement are also like those reported in Table 6 with the added influence of the mother's educational aspirations and the number of schools attended. Thus, these results suggest that, if one omits measures of self esteem, attitudes toward school and a subject area as well as a measure of academic aptitude as influences on achievement, both the mother's educational aspirations for her child and the number of schools which a child attends can have an important influence on achievement. It is important to note that these influences are independent of the child's family structure (whether or not he or she lives

with both the mother and father) and the mother's educational level.

Future Work

The results presented above illustrate only some of the interesting and potentially very important results which will appear from the analysis of the "Springfield data." It is anticipated that further analyses will result in important insights into the nature of children's views of occupations, their learning about occupations, and influences on their academic achievement.

The study was originally designed as a longitudinal one with plans to gather data on the students again when they were in mid-school and in high school. I believe that gathering this additional data would add immeasurably to the value of the project, both for social science researchers and for the school district. For instance, if additional data were gathered, one could assess the extent to which children's preferences for different occupations, attitudes toward various school subjects, orientations toward school, and educational aspirations and expectations persist over time. One could also examine more complex (and thus more realistic) models of influences on students' academic achievement which take into account prior experiences in school. Carefully looking at students in the mid-school and high school years is also important because in those years

students become much more involved in peer cultures and in interactions ranging far beyond the influences of home and school found among fourth graders. Studying the impact of these influences on aspirations and achievement is important in itself. Of even greater interest may be an examination of how children's earlier attitudes toward school and family relations are related to their attachment to a "peer culture" and how both sets of variables influence academic achievement and educational and occupational aspirations.

I propose gathering data from the students in the study (now in the eighth grade) in late winter and spring of 1985. Instead of the intensive data gathering strategy used in the first wave of the study, I suggest that only a written questionnaire be used with each child along with data gathered from school records and, potentially, interviews with school teachers, counselors, principals, and other relevant administrators. I would suggest administration of the schedules in intact classrooms with assistance from the researchers.

My own research interests focus on the issues detailed above: explaining the academic achievement and educational and occupational aspirations of the students. Toward this end I would want to gather data on variables such as those described above as well as information more directly relevant to students in the eighth grade and mid school. These would include items regarding their attachment to the

peer group, the extent to which they are involved in the "peer culture" (e.g. popular music), and their view of the norms held by others in the school and their own peers regarding academic achievement.

I would be happy to gather any information desired by the school district and would like to suggest that the district might be particularly interested in information related to the transition between mid school and high school. Some of my own research has indicated that students' grades drop when moving from junior high (9th grade) to high school (10th grade). One could well ask if this same drop occurs between eighth and ninth grades in a mid-school setting. My own research did not examine the attitudinal precursors or results of this drop in academic performance, although I would suspect that it is related to the stresses and strains involved in moving from one school setting to another. Various measure of "school climate" could be used to assess students' perceptions of the "atmosphere" of the school in the eighth grade year (mid-school) and again in the ninth grade (high school). Comparison of these measures and relating them to measures of students' attitudes, expectations, and achievement could help both researchers and school officials understand more about the difficulties involved in this transition and potential ways of dealing with these problems.

It is expected that a second wave of the study would also be especially helpful to those responsible for curriculum planning, especially in the areas of career and vocational education. One could ask what "in-school" and "out-of-school" variables affect occupational choice? How much effect does career education have on students' career choices? How does the mid-school experience influence students' changing aspirations from the grade school to mid-school years? Data from this research could also help the district assess how successfully it is meeting its career education goals.

Footnotes

1 Differences with a probability of occurrence less than .05 as measured by a standard chi-square test are considered statistically significant in this report.

2 Because the most reliable data on social class of each child are not yet available for analysis comparisons are restricted only to those between boys and girls. Later analyses will also include social class differences.

3. T-tests are used for these comparisons with a significance level of .05 or greater chosen as the cut-off point for purposes of this presentation.

4. This occurs because the anticipated score is computed via a regression equation which regresses achievement on the gender, age, grade, and aptitude of a typical group of students. Any effect of the students' gender found in a multiple regression analysis which included the anticipated score would have to involve variation in addition to that accounted for by the anticipated score and normally accounted for by gender.

5 This procedure is actually an improvement over the typical practice of simply assigning the mean value for the entire group to cases with a missing value. It is based on

the assumption that students within a school are more homogeneous in social class background than the sample as a whole. This assumption indeed is true within this group when only those with data from the mothers' questionnaire are considered.

6 The measure of the mothers' educational expectations came from the mothers' questionnaire and the procedure for assigning missing values was the same as that for the mothers' own level of education described above.

7 Later analyses of the data will utilize a rather complex causal model that allows the incorporation of several dependent variables so that variables such as self esteem can be treated as both a cause and a result of student achievement. Results of these analyses will, of course, be given to the district.

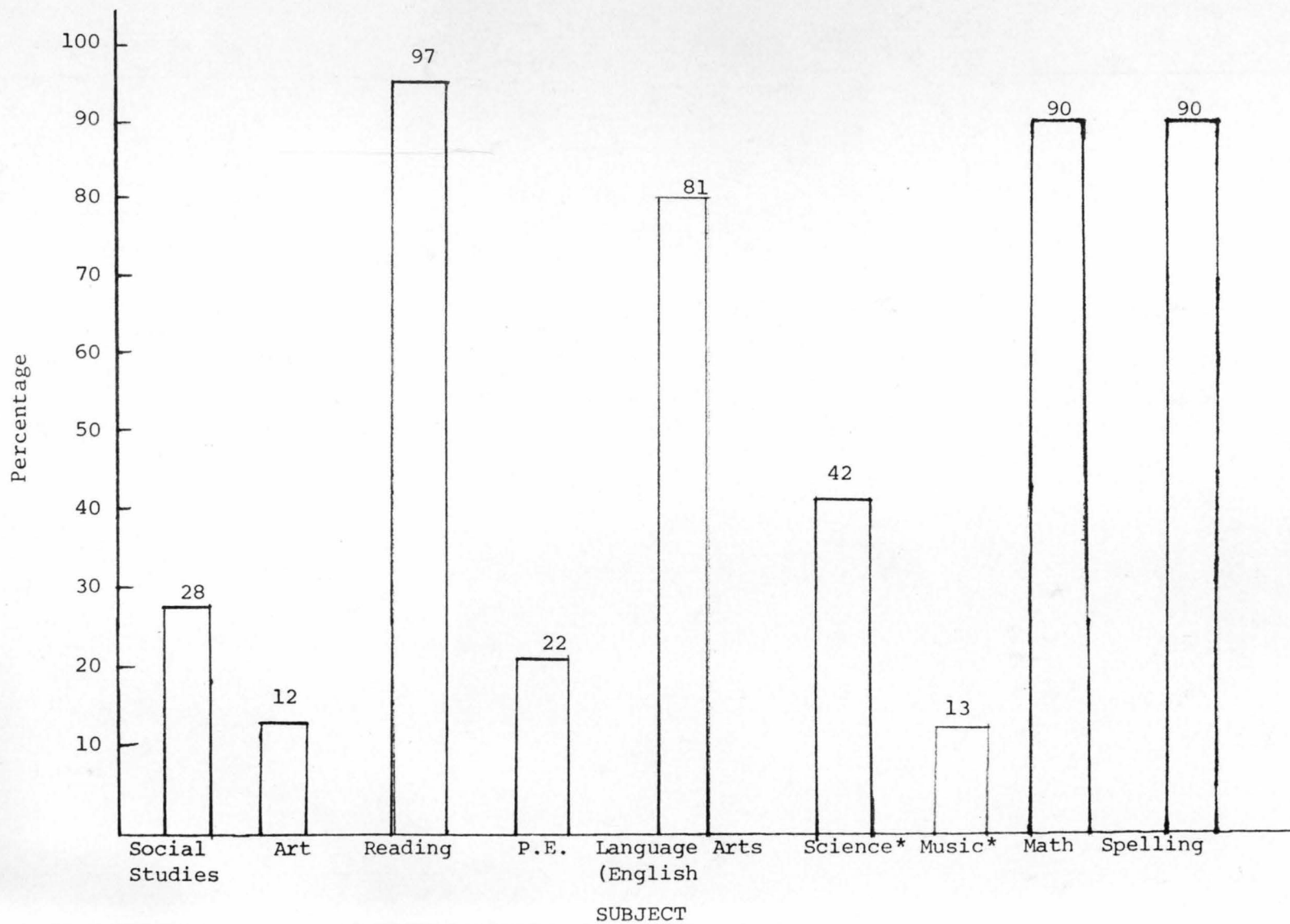


Figure 1: Percentage of mothers who thought it was very important for children their son's or daughter's age to master their school subjects.

* Responses of mothers who had attended college (43% of sample) differed significantly from those of mothers with no college education ($p < .05$)

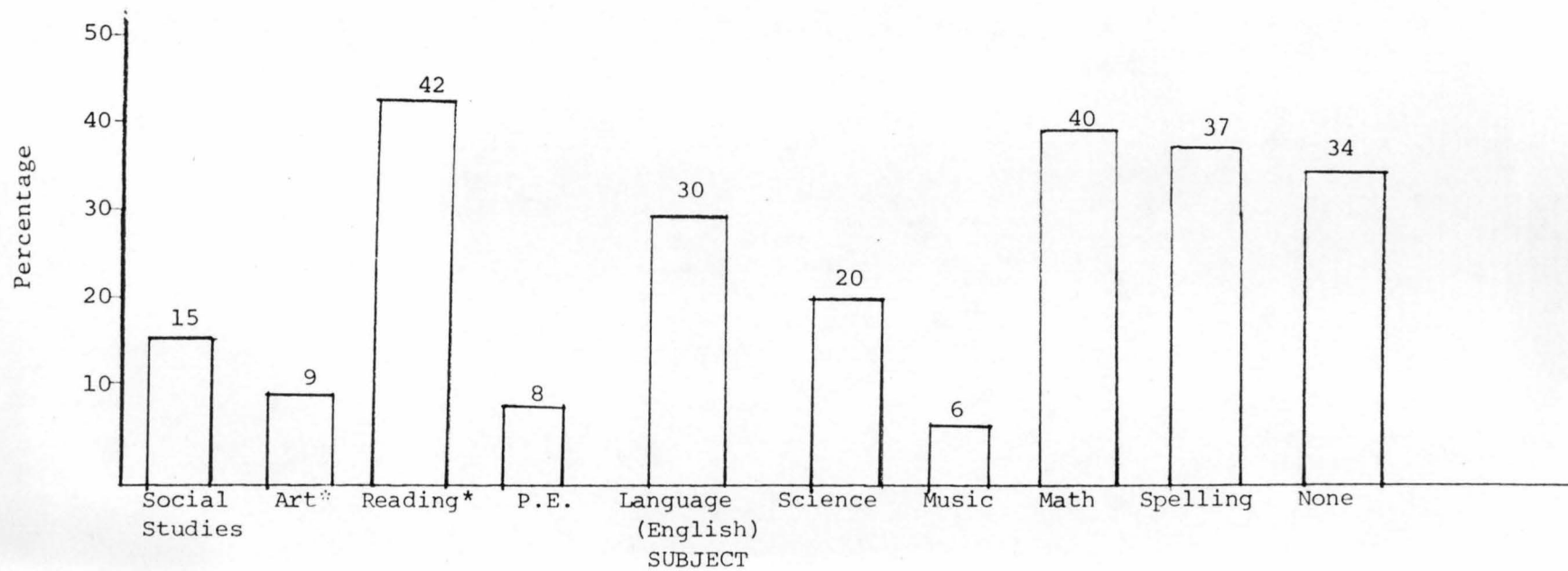


Figure 2: Percentage of mothers who thought their son's or daughter's 4th grade class should have spent more time on these subjects

* responses of mothers who attended college (43% of sample) differed significantly from those of mothers with no college education ($p < .05$)

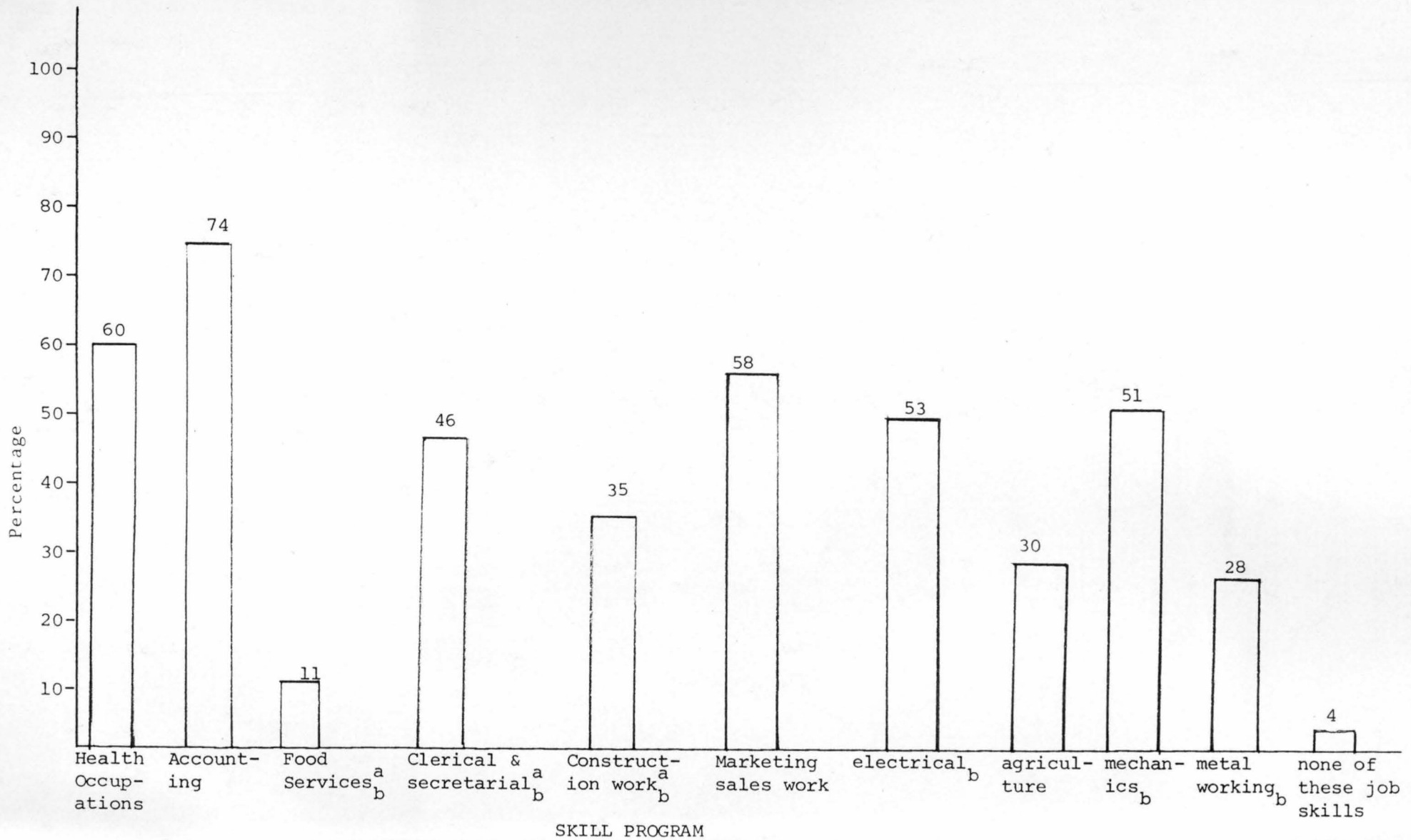


Figure 3: Percentage of mothers saying they would like to have their son or daughter learn these job skills during high school

a Responses of mothers who attended college (43% of sample) differed significantly from those of mothers with no college education ($p < .05$)

b Responses of mothers of daughters differed significantly from those of mothers of sons ($p < .05$)

TABLE 1

RATING OF JOBS ON BOSSING AND DIFFICULTY
DIMENSIONS BY GENDER

Job	BOSSING			Job	DIFFICULTY (5=HARD/1=EASY)		
	Total	Girls	Boys		Total	Girls	Boys
Judge	4.1	4.1	4.2	Surgeon	4.6	4.6	4.6
Police officer	4.0	4.1	4.0	Scientist	4.2	4.2	4.2
High school teacher	4.0	3.9	4.0	Firefighter	4.2	4.2	4.2
Air controller	3.6	3.7	3.6	Pilot	4.1	4.1	4.0
Surgeon	3.5	3.6	3.5	Air controller	4.0	4.0	4.0
Firefighter	3.4	3.3	3.4	Police Officer	3.9	3.9	3.9
Nursery teacher	3.1	3.1	3.1	Judge	3.9	3.9	3.9
Pilot	2.9	2.9	3.0	Architect	3.8	3.9	3.7
Carpenter	2.8	2.7	2.9	TV repair*	3.8	3.9	3.7
Nurse	2.7	2.7	2.7	Carpenter	3.7	3.7	3.6
Architect	2.5	2.4	2.5	High school teacher	3.6	3.6	3.7
Truck driver	2.5	2.5	2.5	Secretary	3.3	3.3	3.3
Scientist	2.5	2.5	2.6	Artist	3.2	3.3	3.1
Librarian	2.4	2.5	2.4	Dancer	3.2	3.2	3.2
Secretary	2.3	2.3	2.3	Nurse	3.2	3.1	3.3
Fast food worker	2.1	2.1	2.2	Hairdresser*	3.0	3.1	2.9
TV repair	2.1	2.1	2.1	Farmer***	2.9	2.7	3.1
Hairdresser	2.1	2.2	2.0	Truck driver*	2.8	3.0	2.7
Grocery clerk	2.0	1.9	2.1	Nursery teacher*	2.6	2.4	2.7
Farmer	2.0	2.0	2.0	Librarian*	2.5	2.4	2.7
Dancer	1.7	1.7	1.7	Grocery clerk	2.4	2.4	2.5
Artist	1.6	1.6	1.7	Fast food	2.4	2.4	2.4

Spearman's rho = .98

Spearman's rho = .97

T value testing the difference between ranking of males and females was significant at

* p < .05

** p < .01

*** p < .001

TABLE 2

RATING OF JOBS ON IMPORTANCE AND MONEY
DIMENSIONS BY GENDER

Job	IMPORTANCE			Job	MONEY		
	Total	Girls	Boys		Total	Girls	Boys
Firefighter	4.8	4.8	4.8	Surgeon	4.6	4.6	4.6
Police officer	4.8	4.8	4.8	Judge	4.2	4.1	4.2
Surgeon	4.8	4.8	4.7	Police officer	4.2	4.3	4.2
Nurse**	4.5	4.6	4.3	Scientist**	4.2	4.1	4.4
Air controller*	4.4	4.3	4.5	Firefighter	4.2	4.2	4.2
Judge	4.4	4.4	4.4	Pilot**	4.1	3.9	4.2
Scientist*	4.3	4.2	4.3	Air controller**	3.9	3.8	4.0
Hi school teacher	4.3	4.3	4.3	Architect	3.9	3.8	3.9
Architect	4.1	4.0	4.1	Nurse*	3.9	4.0	3.8
Pilot**	4.1	4.0	4.2	Carpenter	3.6	3.6	3.7
Carpenter	4.1	4.0	4.1	High schl tchr**	3.6	3.7	3.4
Secretary	3.6	3.6	3.6	Secretary	3.5	3.5	3.5
Grocery clerk*	3.6	3.7	3.5	TV repair	3.4	3.4	3.4
TV repair	3.5	3.4	3.5	Artist	3.4	3.4	3.5
Nursery teacher	3.5	3.6	3.5	Truck driver	3.2	3.1	3.3
Farmer	3.4	3.3	3.5	Grocery clerk*	3.1	3.2	3.0
Librarian	3.3	3.4	3.3	Hairdresser**	3.0	3.2	2.9
Truck driver*	3.2	3.1	3.4	Fast food worker	2.9	3.0	2.8
Fast food	3.2	3.2	3.1	Nursery teacher**	2.8	3.0	2.7
Hairdresser	2.9	3.0	2.8	Librarian	2.7	2.8	2.6
Artist	2.8	2.9	2.7	Dancer	2.7	2.7	2.6
Dancer**	2.3	2.4	2.2	Farmer	2.3	2.2	2.4

Spearman's rho = .97

Spearman's rho = .97

T value testing the difference between ranking of males and females was significant at

* p < .05

** p < .01

*** p < .001

TABLE 3
RATINGS OF JOBS ON PERSONAL CHOICE DIMENSION

Total Group		Girls		Boys	
Artist	3.9	Nursery teacher	4.2	Scientist	3.9
Farmer**	3.9	Hi sch teacher	4.1	Artist	3.8
Fast food***	3.7	Farmer	4.1	Farmer	3.8
Hi sch tchr***	3.6	Artist	4.0	Carpenter	3.8
Scientist***	3.5	Secretary	3.9	Police officer	3.7
Grocery clk***	3.5	Grocery clerk	3.9	Architect	3.7
Police off***	3.5	Fast food	3.9	Pilot	3.5
Librarian***	3.5	Nurse	3.8	Fast food	3.5
Nursery tchr***	3.5	Librarian	3.8	Air traf cont.	3.4
Architect***	3.4	Hairdresser	3.8	Truck driver	3.4
Secretary***	3.3	Dancer	3.7	Firefighter	3.3
Carpenter***	3.3	Police officer	3.3	Grocery clerk	3.2
Air traf con***	3.1	Scientist	3.1	Hi sch teacher	3.1
Pilot***	3.0	Architect	3.1	TV repair	3.1
Hairdresser***	3.0	Air traf cont	2.8	Librarian	3.1
Surgeon*	2.9	Surgeon	2.7	Surgeon	3.0
Firefighter***	2.9	Carpenter	2.7	Judge	2.9
Truck driver***	2.9	Judge	2.6	Secretary	2.8
TV repair***	2.9	Pilot	2.6	Nurs sch tchr	2.8
Judge**	2.7	TV repair	2.6	Hairdresser	2.2
Dancer***	2.7	Firefighter	2.5	Dancer	1.7
		Truck driver	2.3	(No nurse)	

Spearman's rho = -.07

T value testing difference between rankings of males and females significant at

* p < .05

** p < .01

*** p < .001

TABLE 4

MEASURES OF ACHIEVEMENT AND INDEPENDENT VARIABLES

Achievement:

Overall reading achievement score:

mean = 460.7, s=56.5

Overall mathematics achievement score:

mean = 443.0, s=35.2

Overall language achievement score:

mean = 506.3, s=57.1

All scores are from the California Achievement Test.

Aptitude:

Anticipated overall reading score:

mean = 450.7, s=47.7

Anticipated overall mathematics score:

mean = 440.1, s=33.3

Anticipated overall language score:

mean = 492.0, s=43.9

All scores are from the California Achievement Test.

Student Attitudes:

Attitude toward reading: A summated scale combining measures of how much the child likes to read, how hard or easy reading is, how important it is to learn reading, and the extent to which the student does his/her best work in reading. A high score indicates more positive attitudes.

mean = 10.8, s=2.0

Attitude toward mathematics: Includes all of the items in the reading scale except "importance."

mean = 8.3, s=2.1

Attitude toward language: Includes all of the items in the reading scale except "importance."

mean = 7.6, s=1.9

Importance of learning mathematics: A higher score indicates less rated importance.

mean = 2.9, s=0.4

Importance of learning language:

mean = 2.6, s=0.6

I am happy to go back to school after vacation: A higher score indicates more positive attitudes.

mean = 2.4, s=1.1

It is important to me to get a good report card: A higher score indicates more positive attitudes.

mean = 3.8, s=0.6

When I don't do as well as I can in school, it bothers me. A higher score indicates more positive attitudes.

mean = 3.0, s=1.0

Self Esteem, A seven point scale with a higher score indicating lower self esteem.

mean = 1.8, s=1.7

Table 4 (continued)

- Educational Aspirations: I would like to go to college.
A higher score indicates higher aspirations
mean = 2.5, s=0.7
- Educational Expectations: I think that I actually will go to college. Higher score indicates higher expectations.
mean = 2.4, s=0.7
- Frequency of television viewing: a 12 point scale with a higher score indicating more viewing.
mean = 9.8, s=2.2
- Frequency of out-of-school reading for pleasure: a 4 point scale with a low score indicating more reading.
mean = 2.3, s=1.0
- Cooperativeness: A higher score indicates greater self-rated cooperativeness and helpfulness to others
mean = 15.3, s=2.7

Demographic Variables

- Gender 1=female (49%), 2=male (51%)
- Mother's education: a six point scale with a higher score indicating more education*
mean = 3.1, s=1.1

Family Environment

- Parental involvement with school: An 8 point scale combining "I talk about school with members of my family" and "My parents help me with school work."
A higher score indicates less parental support
mean = 5.6, s=1.6
- Family structure: Who student lives with.
1=other (37%), 2=mother and father (63%)
- Mother's educational expectations for child: a higher score indicates higher expectations*
mean = 2.0, s=0.8
- Number of schools child has attended
mean = 2.2, s=1.5

*Data for these variables came from the mother's questionnaire. Because of the large number of missing values for these items, those without data were assigned the mean value for other students in their school.

TABLE 5

ZERO-ORDER CORRELATIONS OF INDEPENDENT VARIABLES
WITH ACHIEVEMENT¹

Independent Variables	Reading Achievement	Mathematics Achievement	Language Achievement
<u>Aptitude:</u>			
Anticipated Score ²	.68***	.53***	.56***
<u>Attitudes:</u>			
Attitude toward subject ²	.08	.31***	.13**
Importance of subject ^{2,3}	---	.06	-.17***
Happy to go back to school	.12*	.14**	.09
Report card important	.01	.06	.05
Bothers if don't do well	.08	.06	.05
Self esteem score	-.27***	-.26***	-.22***
Educational aspirations	.19***	.17***	.16***
Educational expectations	.26***	.20***	.19***
Amount of TV viewing	-.15**	-.10*	-.12*
Amount of leisure reading	-.25***	-.11*	-.19***
Cooperativeness self rating	.09	.05	.03
<u>Demographic Variables:</u>			
Gender	.00	.00	-.06
Mother's Education	.29***	.14**	.20***
<u>Family Environment:</u>			
Parental involvement with schooling	-.07	-.08	-.16***
Family structure (who lives with)	.11*	.10*	.08
Mother's Educational Expectations	.28***	.19***	.25***
Number of schools attended	-.15**	-.15**	-.17***

TABLE 5 (continued)

* $p < .05$
** $p < .01$
*** $p < .001$

- 1 All coefficients are Pearson product moment correlations.
- 2 Measures are different for regressions on reading, mathematics, and language (see Table 4 and 5).
- 3 For reading this measure was incorporated in the measure of attitude toward the subject.

TABLE 6

REGRESSION OF READING, MATHEMATICS, AND LANGUAGE ACHIEVEMENT
ON ALL INDEPENDENT VARIABLES¹

Independent Variables	Reading Achievement	Mathematics Achievement	Language Achievement
<u>Aptitude:</u>			
Anticipated Score ²	.59***	.45***	.46***
<u>Attitudes:</u>			
Attitude toward subject ²	.01	.20**	.03
Importance of subject ^{2,3}	---	.00	-.11**
Happy to go back to school	.05	.06	.02
Report card important	-.02	.04	.07
Bothers if don't do well	.03	.02	.00
Self esteem score	-.12***	-.13**	-.12**
Educational aspirations	-.04	-.01	.01
Educational expectations	.11*	.06	.03
Amount of TV viewing	-.10**	-.07	-.08
Amount of leisure reading	-.10**	.02	-.07
Cooperativeness self rating	-.04	-.06	-.05
<u>Demographic Variables:</u>			
Gender	.00	-.02	-.02
Mother's Education	.12**	.06	.05
<u>Family Environment:</u>			
Parental involvement with schooling	-.06	-.10*	-.14**
Family structure (who lives with)	.05	.03	.03
Mother's Educational Expectations	.04	.00	.08
Number of schools attended	.00	-.04	-.08
R ²	.56***	.35***	.41***
N	421	419	420

TABLE 6 (continued)

* p < .05
** p < .01
*** p < .001

- 1 All coefficients are standardized regression coefficients.
- 2 Measures are different for regressions on reading, mathematics, and language (see Tables 4 and 5).
- 3 For reading this measure was incorporated in the measure of attitude toward the subject.

TABLE 7

REGRESSION OF READING, MATHEMATICS, AND LANGUAGE ACHIEVEMENT ON SELECTED
SUBSET OF INDEPENDENT VARIABLES¹

Independent Variables	Reading Achievement	Mathematics Achievement	Language Achievement
<u>Attitudes:</u>			
Importance of subject ²	---	.05	-.15**
Report card important	-.02	.05	.07
Bothers if don't do well	.03	.01	.01
Educational aspirations	.03	.08	.08
Educational expectations	.13*	.09	.05
Amount of TV viewing	-.09*	-.05	-.06
Amount of leisure reading	-.18*	-.06	-.13
Cooperativeness self rating	.03	.01	.01
<u>Demographic Variables:</u>			
Gender	.01	.02	-.05
Mother's Education	.16**	.05	.06
<u>Family Environment:</u>			
Parental involvement with schooling	-.14**	-.16**	-.21***
Family structure (who lives with)	.08	.07	.05
Mother's Educational Expectations	.14**	.11	.17*
Number of schools attended	-.08	-.11*	-.13**
R ²	.22***	.12***	.20***
N	421	419	420

* p < .05
** p < .01
*** p < .001

1 All coefficients are standardized regression coefficients.

2 Measures are different for regressions on mathematics and language (see Tables 4 and 5). For reading, this measure was incorporated into the measure of attitude toward the subject.

Study of Occupational Learning
1988 Data Gathering Plans

The Study of Occupational Learning began in 1981-82, when the students currently in the eleventh grade of the Springfield schools were in the fourth grade. Data have subsequently been gathered from the students during their eighth and ninth grades in school. We hope to gather the final wave of information from the students during the fall of their twelfth grade.

In earlier waves data have been gathered from the students in individual interviews (fourth and ninth grades), from questionnaires completed during class hours (fourth, eighth, and ninth grades), from written essays on their future plans written during class hours (fourth and eighth grades), from the school records on achievement and attendance (fourth grade), from teachers and administrators (eighth grade), and from mothers of the students (fourth and eighth grade). This time we hope to employ the following strategies:

1) A questionnaire given during class time to all twelfth grade students who are allowed to participate in the study. A draft of the questionnaire is attached. Almost all of the questions were included in earlier waves of the study. Numbers 1-20, 43, 47, 51 (parts a and b), 54, 58-67, 88, 89 (parts a, b, and c), and 90 were asked in all three previous years; numbers 23-40, 42, 44-46, 55-56, 92-94, and 96-98 were asked in both the eighth and ninth grades; numbers 21-22, 41, and 48-50 were asked in the ninth grade; numbers 68-87 were asked in the fourth grade; and numbers 51 (parts c and d), 52-53, 57, 89 (parts d, e, and f), 90 and 91 were asked in the fourth and ninth grade. (The phrasing was sometimes altered to better fit the age of the students.) Only question 95 has not been asked before.

2) An hour-long indepth interview, similar to those used in earlier years, with a selected subsample of approximately 70 students. Students will be selected for interviews based on their responses to the surveys over the years. Approximately one-half of the students will be those whose aspirations have declined over the years of the study and one-half will be those whose aspirations have stayed the same or increased. We will try to include an equal number of males and females and students from a variety of socio-economic and family backgrounds and interview them during study halls and other non-class times. The interview schedule will, of course, be submitted for approval before it is administered.

3) If teachers are willing and interested, an essay on the students' views of their future lives that would parallel those written in earlier years.

4) A mailed questionnaire to the students' mothers. It would be similar to those used in the fourth and eighth grades, but have alterations appropriate for the students' current grade level. It will be mailed at a time deemed most appropriate by district officials.

5) Data from school records on the students' achievement, grades, and attendance in the years since the fourth grade, including information on graduation and, if possible, dropout status for those no longer in school.