

*Senior Project*  
*Department of Economics*



“PARENT’S CHOICES AND  
CONSEQUENCES: HOW THE  
LABOR PARTICIPATION  
CHOICES OF PARENTS  
AFFECT THEIR CHILDREN’S  
EDUCATIONAL ACHIEVEMENT”

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# **Parent's Choices and Consequences: How the labor participation choice of parents affect their children's educational achievement**

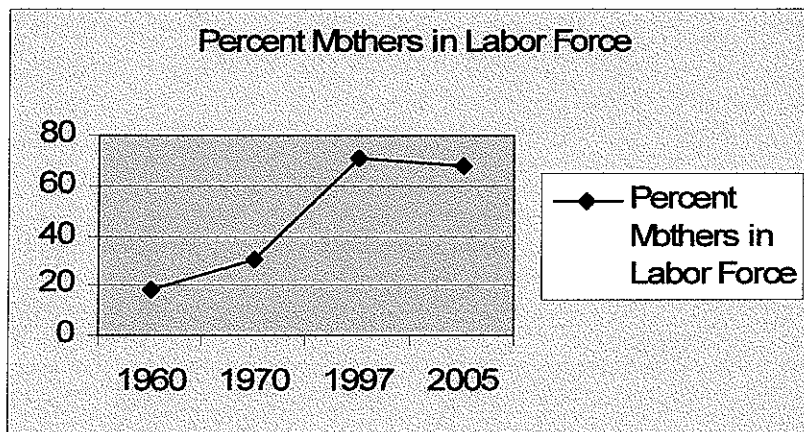
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By Shawna Brasty**

*This study analyzes the effects of parent work status on high school student's cognitive abilities measured by PISA Math and Reading test scores. The data used in the analysis comes from the National Center for Education Statistics ELS: 2002. The results indicate that the optimal work situation for the female guardian is to work part-time or be a house "wife" and the male guardian to work full-time in a two-parent home. Other results include that higher income levels increase both test scores. Children from a two biological parent home score the highest on both tests. If the child expects to go on to at least a four year college they score higher on the tests then those who expect less of their future education. When parents aspire for their children to go on to a four year college or higher their scores in both tests rise significantly.*

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## Introduction

The addition of children to a family causes parents to re-evaluate their labor participation choices. Dual-income could be necessary to maintain the standard-of-living that the married-couple is accustomed to. Therefore, married-couple families tend to be dual-income families, whether one works full-time and the other works part-time or they both work full-time. In 2005, the percent of married-couple households with only the husband working was 20.2%, only the wife working was 6.5%, and both parents working was 51.3%. These couples do not necessarily have children. The labor force participation rate for married mothers was 70.7% in 1997. The percentage rate of mothers in the labor force has been trending downward and is holding steady



at 68.2%.<sup>1</sup> These mothers can be married or can be single parents. Single mothers do not face the same choice as married mothers when it comes to labor force participation. The choice for

a single mother is whether she works one job or two. In contrast, married mothers have the option to stay at home and keep house. Additionally, for married mothers both parents are involved in the mother's decision to work. Do both parents need to work, who should work, and how much should each parent work? The affect of the parent's work schedules on the children should also be considered. How much time will they be spending with their children? Who will be raising their children?

The proposed study will analyze the environmental and personal characteristic aspects of the parental choices on labor participation and their relationship to the children's cognitive

<sup>1</sup> Bureau of Labor Statistics, April 27 2006, Employment Characteristics of Families Summary, (retrieved on February 22, 2007 from <http://www.bls.gov/news.release/famee.nr0.htm>)

ability. Investing in children's education is an investment in the country's future. This research is important for parents and policy makers. The results of this research can be used by parents as a guide in their labor participation choices. Policy makers can use this research as a guide for helping married parents make the right choices financially through tax incentives and structural changes.

This study will test the hypothesis that parents' work-hours can have a negative effect on cognitive ability measured by PISA math and reading test scores. There are different methods used to study this issue. In Datcher-Loury (1988) maternal home time is used as a parental work variable and the number of years in school is used to measure children's educational achievement. Rainey and Moruva (2004) use income as the parental work variable and achievement test scores to measure educational achievement. These studies contradict each other. Datcher-Loury (1988) concludes that more home-time leads to better educational achievement. Rainey and Moruva (2004) and Waldfogel, Han, and Brooks-Gunn (2002) conclude that both parents working will lead to better educational achievement of the child.

This study uses parent's current employment status to measure parent home-time and work-time. Employment status is separated into full-time, part-time, unemployed, and house-parent. This study uses cognitive ability as a measure of educational achievement. PISA reading and math test scores are used to measure the student's cognitive ability.

### **Literature Review**

There has been plenty of research on children's cognitive abilities. Waldfogel, Han, and Brooks-Gunn (2002) uses the National Longitudinal Study of Youth to investigate what effect maternal employment has on the early cognitive development of children. 1,872 children were followed from birth to age 7 or 8. Their study shows there are persistent negative effects of maternal employment on the first year of a child's life. In the second and third year of life,

maternal employment shows some positive effects on cognitive outcomes for non-Hispanic white children.

Income is a determinant factor in labor choice participation that can affect student performance as well. Randolph, Rose, Fraser, and Orthner (2004) focuses on low-income families. They show that the more times a mother changes employment, the greater the risk that her child will drop out of school. Children whose mothers change jobs five or more times are 36% more likely to drop out of school than students with mothers who changed work less than five times. Also, the higher the income of the children's family, the less likely they are to drop out. This study shows the importance of income on a student's educational outcome.

One aspect of the Rose, Fraser, and Orthner (2004) study is the fluctuating work situation of the mother. This fluctuating work situation can effect the child's time spent with the mother which is shown to be important in Datcher-Loury (1988). While other studies that have focused on maternal employment in terms of employed or not, Datcher-Loury (1988) study use mothers work hours to see how much time the mother is spending with their kids. The data for this study came from the University of Michigan, Panel Study of Income Dynamics (PSID). The results of this study show that maternal child care time increases with higher maternal home productivity and falls with higher opportunity costs of home time which was measured using an instrumental variables regression. . Maternal child care time significantly raises children's years of schooling. The impact on children's years of schooling is limited to children whose mothers had at least 12 years of schooling. Finally, when other siblings are examined she shows that more siblings in the same or older age groups lower the level of schooling the child will receive. A possible reason for the decrease in level of schooling is that less time is spent with each child when there are more children to have to spend time with.

Rainey and Murova (2004) analyzes what factors influence human capital formation. Data was collected for this study from a total of 1,970 school districts across Arkansas,

Louisiana, Oklahoma, and Texas for two academic years (1998-1999 2000-2001). Socioeconomic and policy variables were taken from the National Center for Education Statistics database and Household information from the 1990 Census and 2000 School District Demographics tables. Analysis of the regression shows that socioeconomic variables have a significant impact on school performance along with school policy variables on class size. The regression shows that a higher median household income improves achievement scores. Finally, children from parents that at least have a high school diploma performed better in elementary school than those children whose parents did not receive their diploma. Children from families where their parents have bachelor's degrees performed better in elementary, middle, and high school.

O'Brien (1999) uses a survey and time-use diary from a local English case study. The study was conducted to see the impact of parental employment on the educational attainment for children from two boroughs of London. The results from this study show that the odds of getting a low score (bottom 25<sup>th</sup> percentile) is 70% lower for children of families with dual-worker parents, where the mom works part-time, than for children of families where only the father works. It is 42% less likely that a child will get a low score if the child is from a two full-time worker family compared to a household that has a housewife for a mother. The model shows that children from Part-Time working mothers are 53% less likely to score low compared to the Full-Time working mother household. Decreasing the number of maternal work hours can combat low scores, but not working at all will not combat low scores. The study shows that it is better for the mothers of these boroughs to work part-time than it is for them to not work at all or to work full-time. The values of these boroughs play a large role in the results. The majority of the men working in these boroughs are industrial workers or laborers. Their values on education reflect the current work situation of the fathers. Higher education is not highly desirable. The

industrial and laboring men are not bringing in enough income so the women need to work part-time to maintain their standard of living.

## **Methodology**

### **Model**

This study uses the Rainy and Murova (2004) model  $A=f(X,Z)$  which is based on the Cobb-Douglas Production Function. In the Rainy and Moruva model, A is the measure of student achievement X is a set of student and family characteristics and Z is a set of school policy variables. Similarly this study will use the model

$$Y_i = \alpha + \beta_1 S + \beta_2 F + \beta_3 C + \beta_4 H + \epsilon$$

Where  $Y_i$  is the measure of student achievement measured using PICA math test scores and PICA reading test scored which are a similar measure as that used by Waldfogel, Han, and Brooks-Gunn (2002), Murnane, Willett, Duhaldeborde, Tyler (2000). S is the group of socioeconomic variables including sex, race, family income, etc. The socioeconomic variables used are similar to the variables used by Waldfogel, Han, and Brooks-Gunn (2002), Rainy and Moruva (2004), and Rose, Fraser, and Orthner (2004). Rose, Fraser, Orthner (2004) only considered low-income, this study will include all income levels. F is the group of family characteristics including family composition, parent's educational attainment, and parents' work status. These variables can be found in O'Brien (1999) and Waldfogel, Han, and Brooks-Gunn (2002). C is the group of the child's individual characteristics including future education expectations by both the student and the parents. It is expected that the farther in school a child expects to go or the parents expect them to go, the better they will do on their PICA tests or the worse they will do if the expectation of future education is not there. These variables are used as a proxy for the educational values of the student and family which was found to be a factor in O'Brien (1999). H is a group of school characteristics which include what type of school and the

highest degrees of both English and Reading teachers. The parameters that need to be estimated are  $\alpha$ ,  $\beta_1, \beta_2, \beta_3, \beta_4$  and  $\epsilon$  the error term.

### Data

The data used in the analysis comes from the National Center for Education Statistics ELS: 2002. The ELS:2002 is a longitudinal study of U.S. high school students. The base year survey ELS:2002 of sophomores was completed in the Spring of 2002. This sample is an acceptable age group for this study because cognitive ability increases at a decreasing rate until the age of 20 Giedd et. al (1999). The key elements of the base year survey were cognitive tests in reading and math, surveys completed by the students, parents, English teachers, math teachers, and administrators. The sample came from 750 schools and 15,362 students participated. The schools were selected as a nationally representative group of schools and the students within the schools were randomly selected. The number of Asians and Private schools were over-sampled.

The PICA math and PICA reading scores are the dependent variables. Binary variables were created to identify various socioeconomic, family background, child's individual characteristics, and school variables. Income levels were divided into four categories: NO\_INCOME, POVERTY, LOW\_INCOME, MIDDLE\_INCOME, and UPPER\_INCOME. NO\_INCOME is exactly 0 family income which could occur due to unemployment. POVERTY is defined by a family income being from \$1-\$15,000.<sup>2</sup> LOW\_INCOME is defined by family income being from \$15,000-\$25,000.<sup>3</sup> MIDDLE\_INCOME is defined by a family income being from \$25,001-\$100,000.<sup>4</sup> MIDDLE\_INCOME was left out of the model to be compared to. UPPER\_INCOME is defined by a family income of over \$100,000.<sup>5</sup> Student's expectations as well as parents aspirations for their children's future education were also entered in as binary

<sup>2</sup> The Department of Health and Human Services use this as a guideline for being in the poverty threshold. These families are of at least two persons, a parent and the student. The measure for at least a family of two was applied.

<sup>3</sup> The US Department of Education Federal TRIO Programs 2007 Annual Low Income Levels was used for the Low\_income definition

<sup>4</sup> There is no clear definition of middle income so what people conventionally think of as middle class is what I have used to define middle income. This is from the Washington Times report "What is Middle Class"

<sup>5</sup>Upper income is only defined as being more then middle income.



variables. Each level of education was entered separately for both parents and the student. FEMALE is the binary variable used for sex. BLACK, HISPANIC, ASIAN, and OTHER\_MIX are all entered as binary variables for race. Family composition consists of many binary variables. MOTH\_MALEGARD is a household that consists of a Mother and a male guardian. FATH\_FEMGARD is a household that consists of the child's father and a female guardian. BOTHGARD is a household where there is both female and a male guardian running the house. MOTHERONLY is a single mother household. FATHERONLY is a single father household. FGARDONLY is a single female guardian household. MGARDONLY is a household with male guardian only. Mother's and Father's educational background was also entered in binary for each level of education both of them had attained these levels include not graduating high school, going to and or completing a 2 year college, going to and or completing a 4 year college, and receiving a masters or a doctorate degree.

The variables used to describe the work status of the parents were separated by male and female guardian. Male guardians are biological fathers, male guardians, stepfathers, foster fathers, and other types of legal male guardian. Female guardians are biological mothers, female guardians, stepmothers, foster mothers, and other types of legal female guardians. The reference group for work status of male and female guardians was those guardians who work full-time.<sup>6</sup> F\_UNEMPLOY and M\_UNEMPLOY are the variables for a female guardian or male guardian who is unemployed and does not purposefully stay at home to keep house. The variables FHEAD\_PART and MHEAD\_PART represent those guardians who work part-time<sup>7</sup>. The variables HOUSE\_FEMALE and HOUSE\_MALE were created using those guardians who were not currently working, but are out of the workforce because they have chosen to stay home and keep house without pay. A woman who is considered a HOUSE\_FEMALE will be named a

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<sup>6</sup> Full-time is defined by 35+ hours per week (ELS:2002)

<sup>7</sup> Part-time is 1-34 hours per week (ELS:2002)

house “wife” throughout the remainder of the paper. The basic statistics for each variable is listed in Simple Statistics Appendix A.

The reference group is identified as a white family. The child is male. Both parents graduated from high school. Both parents work full-time. The family is a middle-income family. The child and the parents both aspire for the child to go to a 4 year college. This reference group family was chosen for its ability display today’s American society.<sup>8</sup>

### **Results**

The statistical significance of the parent work status variables that are focused on, change between the math and reading test models. The work status variables that are significant for the math test scores are HOUSE\_FEMALE and M\_UNEMPLOY. House female is the best working situation for the female guardian. Compared to a female head of house working full-time, a child from the same reference group that has a house “wife” for a mother will score 5.4 points higher. If the male guardian is unemployed it significantly negatively affects the student’s math test score by 8 points. The work status results of the reading model show statistical significance in female and male guardian part-time status, house “wife”, and male guardian unemployment variables. If the female guardian works part-time instead of full-time it increases her child’s reading test score by 7.3 points. A part time working mother is the best working situation for the female head of house for the reading test model. Children from a household with the female head serving as a house “wife” also do better on the reading test then a child of full-time working mothers. A child from a house “wife” household scores 4.8 points higher. If the male head of house works either part-time or is unemployed this will decreases the reading test score by 8.6 points. It is important to remember that the child in the model is a male. If the child was female, then the math scores would decrease an average of 18 points. This decrease for the math test, negates any affect the work status variables have on the student. If the child was female for the

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<sup>8</sup> Each variable has either the highest percentage of the sample for their category, or logically fit the reference family based on other variables already included as reference variables.

reading test, then the score would go up an average of 5.3 points. This increase shows that for the reading test both male and female children are both positively affected by the mother working part-time or being a house “wife”. The results are listed in Table 1 and Table 2.

Family composition also plays a role in the children’s test scores. For the math test, a household composed of biological mother and biological father show the highest scores. This also holds true for the reading test. The single mother household is significant for the math test and compared to a biological mother and father family, their scores decrease by 8 points. The single mother household is not statistically significant in the reading model. The results are listed in Table 3 and 4.

It was expected that students from high income families would score the best of the income levels,<sup>9</sup> which showed to be true in this study. The middle income families were the income reference group. For both tests children from high income families scored 12-15 points higher than the middle income families. Low income children scored 10-13 points less than the middle income families and poverty children scored 20-25 points less than the reference group. These results are shown in Table 5 and 6 along with the following.

Higher parent education levels were expected to increase test scores<sup>10</sup>. This held true in both models. If either parent did not graduate high school then each test score decreased. If either one of the parents in either of the models earned their Masters or PHD then their children’s test scores were the highest.

For the math test, Black students test scores fared the poorest compared to white students at an average of 65.4 points lower and on the reading test 58.7 points lower. Hispanic students also scored very low compared to white students at an average of 48 points in the math test and 47 points on the reading test. Asian students scored higher on the math tests by 6 points, but

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<sup>9</sup> This is seen in Randolph, Rose, Fraser, and Orthner (2004)

<sup>10</sup> This is seen in Rainy and Moruva (2004)

scored lower on the reading tests by 21 points. This could be due to the family not using English as their first language.

### **Conclusions**

The purpose for this study was to analyze the affect parent's work status has on their children's educational attainment. Educational attainment was determined using cognitive ability, measured by PICA reading and math tests. This study provides powerful, relevant, and statistically significant results pertaining to the educational achievement of the teenage students in America.

Mother's work hours significantly affects the child's cognitive abilities in both math and reading. The more the mother works, the worse the student does on for the math test. For the reading test working full-time is the worst work decision for the student. The best work decision is for the mother to work part-time and the house "wife" is not too far behind. The father's work hours, also, significantly affects the child's cognitive abilities, but the affect is in the opposite direction of the mother. The less the father works the worse the child will do on the cognitive ability tests. For the reading test, if the father is unemployed or working part-time, the test scores both decrease by the same amount. This signals the importance of the father working full-time. In this study there were not enough men serving as a house "man" to investigate their effect on the children's cognitive ability. It would be interesting to see if the opposite affects on cognitive ability hold true when the male and female roles are completely reversed.

Policy implications for improving our children's educational achievement should give mothers incentive to stay at home with their children or work part-time. Lower income taxes for mothers who work part-time. Lower income taxes for parents where the father works full-time and the mother is a house "wife".

Family composition is also very important. A household made up of a biological mother and biological father shows to be the best family composition for the student. Knowing this, it is important to consider our current policies and how they affect these parents who are not divorcing and who are both caring for their children. There are all sorts of government programs that support single mothers. Foster parents have special incentives. There are already tax incentives for being married, but tax incentives specifically for married couple parents where both parents are the biological parents of their child(ren) do not exist.

To further this study the addition of relationship variables should be used to determine what effect specific relationships have on the cognitive abilities of the children. An example of this would be looking at the relationship between house "wife" and English as a first language variables. Another example of a relationship in the study that should be further investigated the interaction between work status and family composition variables. Another way to enhance this study would be to separate the income levels by 10's of thousands of dollars instead of the broader categories used in this study. The middle income range in this study is between \$25,000 and \$100,000. This broad range encompasses the majority of the sample. There could be individual points within this range that show different educational achievement results for the student. Finally, the ELS:2002 is a longitudinal survey, when follow-up results are available the number of years of education the student completes should also be considered to show educational achievement. Some students do not test well and including years of education will enhance the definition of educational achievement to include these students. When looking at educational achievement greater human capital is the definition for success and cognitive ability does not completely show the human capital formation of the student.

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APPENDIX A		SIMPLE STATISTICS				
Variable	Description	N	Mean	Standard Dev	Min	Max
BYPISME	MATH PISA	7810	493.879	86.38	308.87	732.24
BYPISARE	READING PISA	7810	524.912	87.88	344.31	709.26
NO_INCOME	0 INCOME	7832	0.00497	0.07	0	1
POVERTY	\$1 - \$15,000 FAMILY INCOME (FI)		0.0989	0.3	0	1
LOW_INCOME	\$15,000-\$25,000 (FI)	7832	0.1151	0.32	0	1
MIDDLE_INCOME	\$25,001-\$100,000 (FI)	7832	0.6675	0.47	0	1
UND_STEXP	undecided about future education	7832	0.0983	0.3	0	1
STEXP_NOGRADHS	does not expect to graduate highschool	7832	0.0086	0.09	0	1
STEXP_2YR	expects to go to 2 year college or graduate from 2 year college	7832	0.0667	0.25	0	1
STEXP_4YR	expects to go to 4 year college or graduate from 4 year college	7832	0.3946	0.49	0	1
STEXP_PHD	expects to receive Masters or PHD	7832	0.3622	0.48	0	1
PARASP_NOGRADHS	Parents do not aspire for child to graduate highschool	7832	0.0007	0.03	0	1
PARASP_2YR	parent expects student to go to 2 year college and or graduate	7832	0.0921	0.29	0	1
PARASP_4YR	parent expects student to go to 4 year college and or graduate	7832	0.4641	0.5	0	1
PARASP_PHD	parent expects student to graduate with Masters or PHD degree	7832	0.4057	0.5	0	1
FEMALE	Student is Female	7832	0.5093	0.5	0	1
ASIAN_OTHER	Student is Asian, Alaskan, or multi-racial	7832	0.162	0.37	0	1
BLACK	Student is African American	7832	0.1331	0.34	0	1
HISPANIC	Student is Hispanic	7832	0.1336	0.34	0	1
MOTH_MALEGARD	Family composition (FC) of mother and male guardian other then father	7832	0.1227	0.33	0	1
FATH_FEMGARD	(FC) of father and female guardian other then mother	7832	0.032	0.18	0	1
BOTHGARD	(FC) of both guardians other then biological parents	7832	0.0052	0.07	0	1
MOTHERONLY	(FC) Single mother	7832	0.1838	0.39	0	1
FATHERONLY	(FC) Single father	7832	0.0297	0.17	0	1
FGARDONLY	(FC) Single male guardian	7832	0.0029	0.05	0	1
MGARDONLY	(FC) Single female guardian	7832	0.0017	0.04	0	1
MOTH_NOGRADHS	mother did not graduate highschool	7832	0.1267	0.33	0	1
MOTH_2YR	mother went to or completed 2 year college	7832	0.2487	0.43	0	1
MOTH_4YR	mother went to or completed 4 year college	7832	0.2667	0.44	0	1
MOTH_PHD	mother has earned Masters or PHD	7832	0.073	0.26	0	1
FATH_NOGRADHS	father did not graduate highschool	7832	0.1361	0.34	0	1
FATH_2YR	father went to or completed 2 year college	7832	0.1871	0.39	0	1
FATH_4YR	father went to or completed 4 year college	7832	0.2571	0.44	0	1
FATH_PHD	father has earned Masters or PHD	7832	0.1131	0.31	0	1
HOUSE_FEMALE	Female Guardian stays home to keep house	7832	0.1004	0.3	0	1
HOUSE_MALE	Male Guardian stays home to keep house	7832	0.003	0.06	0	1
F_UNEMPLOY	Female Guardian is unemployed	7832	0.1164	0.32	0	1
M_UNEMPLOY	Male Guardian is unemployed	7832	0.0757	0.26	0	1
FGUARD_PART	Female Guardian works part-time	7832	0.5768	0.49	0	1
MGUARD_PART	Male Guardian works part-time	7832	0.6958	0.46	0	1

Table 1

**Heads of House Work Status Reading Test Results**

Variable	Parameter Estimate		t-value
Reference Family (Both Heads Work Full-Time)	529.43	Constant	
Part-Time Female Head (FHEAD_PART)	7.33875	***	3.14
Part-Time Male Head (MHEAD_PART)	-8.66273	*	-1.74
Stay at home Female Head (HOUSE_FEMALE)	4.82739	*	1.68
Stay at home Male Head (HOUSE_MALE)	-19.0706		-1.28
Female Head Unemployed (F_UNEMPLOY)	-1.05279		-.696
Male Head Unemployed (M_UNEMPLOY)	-8.60819	***	-2.66

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level

*Male and Female Head(s) Work Status and Reading Test Scores*

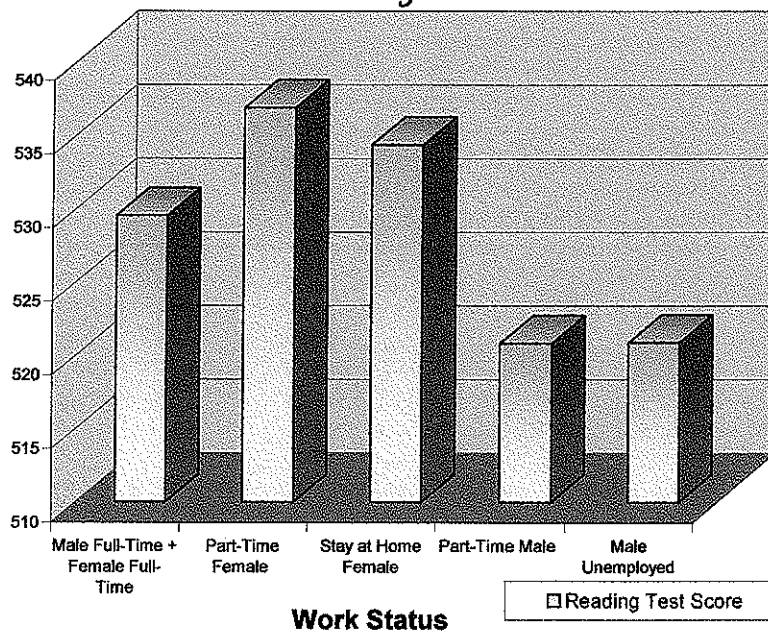




Table 2

**Heads of House Work Status Math Test Results**

Variable	Parameter Estimate	t-value
Reference Family (Both Heads Work Full-Time)	510.43	Constant
Part-Time Female Head (FHEAD_PART)	3.6366	1.63
Part-Time Male Head (MHEAD_PART)	-6.1702	-1.30
Stay at home Female Head (HOUSE_FEMALE)	5.3769	*** 1.96
Stay at home Male Head (HOUSE_MALE)	-7.14401	-0.50
Female Head Unemployed (F_UNEMPLOY)	-1.77374	-0.69
Male Head Unemployed (M_UNEMPLOY)	-13.2784	*** -4.31

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level

*Male and Female Head(s) Work Status and Math Test Scores*

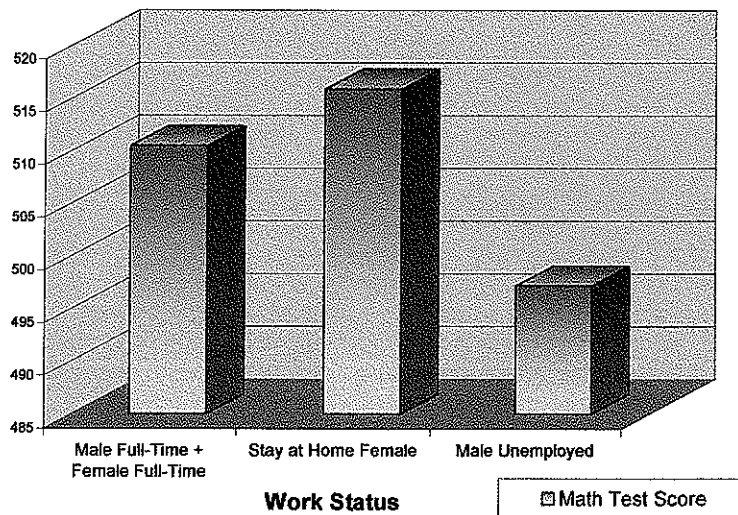


Table 3

**Family Composition Reading Test Results**

Variable	Parameter Estimate		t-value
Reference Family (Mother + Father)	529.4326	Constant	
Single Mother (MOTHERONLY)	-3.674		-1.46
Mother + Male Guardian (MOTH_MALEGARD)	-9.19545	***	-3.54
Father + Female Guardian (FATH_FEMGARD)	-16.4712	***	-3.5
Single Female Guardian (FGARDONLY)	-23.5971		-1.56
Both Guardians (BOTHGARD)	-31.6561	***	-2.78
Single Father (FATHERONLY)	-7.05056		-1.42
Single Male Guardian (MGARDONLY)	5.81693		0.3

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level

Table 4

**Family Composition Math Test Results**

Variable	Parameter Estimate		t-value
Reference Family (Mother + Father)	510.43	Constant	
Single Mother (MOTHERONLY)	-8.03708	***	-3.35
Mother + Male Guardian (MOTH_MALEGARD)	-9.8467	***	-3.98
Father + Female Guardian (FATH_FEMGARD)	-16.8069	***	-3.75
Single Female Guardian (FGARDONLY)	-33.0146	**	-2.28
Both Guardians (BOTHGARD)	-37.8069	***	-3.49
Single Father (FATHERONLY)	-1.59457		-0.34
Single Male Guardian (MGARDONLY)	-22.7165		-1.23

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level

Table 5

## Other Variables For Reading Test Scores

Adjusted R-SQ .3246

Variable	Parameter Estimate	Standard Error	t-value
Reference Family (White, Middle Income, male student, both parents graduated high school, both parents work full-time, The child and the parents aspire for the child to go to a 4-year college)	529.43263		
High Income (HIGH_INCOME)	12.19234 ***	2.83	4.31
Low Income (LOW_INCOME)	-13.6481 ***	2.8	-4.87
Poverty (POVERTY)	-25.3945 ***	3.17	-8.02
No Income (NO_INCOME)	-20.172 *	11.77	-1.71
Undecided about future education (UND_STEXP)	-12.8002 ***	2.95	-4.34
Student doesn't expect to Grad. H (STEXP_NOGRADHS)	-64.8813 ***	8.92	-7.27
Student exp. to Grad. HS only (STEXPGRAD_HS)	41.22148 ***	3.52	-11.71
Student expects to go to 2-YR coll (STEXP_2YR)	-14.482 ***	3.53	-4.11
Student expects Masters or PHD (STEXP_PHD)	22.45938 ***	1.96	11.47
Parents aspire not grad HS (PARASP_NOGRADHS)	-36.1914	29.7	-1.22
Parents aspire student to grad HS (PARASP_GRADHS)	-26.8221 ***	4.58	-5.86
Parents aspire st. to go to 2-YR col (PARASP_2YR)	-30.2096 ***	2.97	-10.20
Parents " " Get masters or PHD (PARASP_PHD)	18.78015 ***	1.84	10.19
Female (FEMALE)	5.32165 ***	1.67	3.18
Asian (ASIAN)	-21.6347 ***	2.9	-7.47
Other or Mixed Race (OTHER_MIX)	-18.4882 ***	3.61	-5.12
African American (BLACK)	-58.6811 ***	2.65	-22.13
Hispanic (HISPANIC)	-47.479 ***	2.67	-17.75
Mother did not graduate HS (MOTH_NOGRADHS)	-11.7327 ***	3.04	-3.86
Mother went to 2-YR college (MOTH_2YR)	4.46385 *	2.31	1.93
Mother went to 4-YR college (MOTH_4YR)	14.93192 ***	2.41	6.2
Mother received Masters or PHD (MOTH_PHD)	21.3951 ***	3.79	5.64
Father did not graduate HS (FATH_NOGRADHS)	-10.2322 ***	2.89	-3.53
Father went to 2-YR college (FATH_2YR)	2.32898	2.46	0.95
Father went to 4-YR college (FATH_4YR)	10.48457 ***	2.36	4.44
Father received Masters or PHD (FATH_PHD)	17.27834 ***	3.25	5.32

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level

Table 6

Other Variables For Math Test Scores

Adjusted R-SQ .3638

Variable	Parameter Estimate	Standard Error	t-value
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510.43431

Reference Family (White, Middle Income, male student, both parents graduated high school, both parents work full-time, The child and the parents aspire for the child to go to a 4-year college

High Income	(HIGH_INCOME)	15.34415	***	2.7	5.68
Low Income	(LOW_INCOME)	-10.7213	***	2.67	-4.01
Poverty	(POVERTY)	-20.6565	***	3.02	-6.84
No Income	(NO_INCOME)	-9.5856	***	11.23	-0.85
Undecided about future education	(UND_STEXP)	-14.996	***	2.82	-5.32
Student doesn't expect to Grad. H	(STEXP_NOGRADHS)	-74.6771	***	8.51	-8.77
Student exp. to Grad. HS only	(STEXPGRAD_HS)	-43.1555	***	3.36	-12.85
Student expects to go to 2-YR coll	(STEXP_2YR)	-17.3833	***	3.36	-5.17
Student expects Masters or PHD	(STEXP_PHD)	22.88288	***	1.87	12.25
Parents aspire not grad HS (PARASP_NOGRADHS)	(PARASP_NOGRADHS)	-31.3498	***	2.96	-1.11
Parents aspire student to grad HS (PARASP_GRADHS)	(PARASP_GRADHS)	-31.3498	***	4.37	-7.13
Parents aspire st. to go to 2-YR col (PARASP_2YR)	(PARASP_2YR)	-30.2096	***	2.97	-10.20
Parents " " Get masters or PHD (PARASP_PHD)	(PARASP_PHD)	17.8795	***	1.76	10.16
Female	(FEMALE)	-18.18	***	1.6	-11.40
Asian	(ASIAN)	6.24474	**	2.26	2.26
Other or Mixed Race	(OTHER_MIX)	-20.9406	***	3.44	-6.08
African American	(BLACK)	-65.485	***	2.53	-25.89
Hispanic	(HISPANIC)	-47.5069	***	2.55	-18.62
Mother did not graduate HS (MOTH_NOGRADHS)	(MOTH_NOGRADHS)	-12.9614	***	-4.47	-4.47
Mother went to 2-YR college	(MOTH_2YR)	1.93297	***	2.2	0.88
Mother went to 4-YR college	(MOTH_4YR)	11.05452	***	2.3	4.81
Mother received Masters or PHD	(MOTH_PHD)	20.38834	***	3.62	5.64
Father did not graduate HS (FATH_NOGRADHS)	(FATH_NOGRADHS)	-4.05527	***	2.76	-1.47
Father went to 2-YR college	(FATH_2YR)	4.53062	*	2.35	1.93
Father went to 4-YR college	(FATH_4YR)	10.21735	***	2.25	4.53
Father received Masters or PHD	(FATH_PHD)	21.25023	***	3.1	6.86

\*\*\* Significant at 1% Level \*\* Significant at 5% Level \* Significant at 10% Level