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Education, Gender, and Work in Explaining Income Inequality

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Abstract: This paper looks at how education, sex, hours worked, occupational prestige, and type of job (government or private) relate to people's income. Using data from the General Social Survey (GSS), we used Stata to run different types of analysis, including descriptive, bivariate, multivariate, moderation, mediation, and prediction. Our results showed that education has a strong positive effect on income. Hours worked and occupational prestige also increase income, while being female is linked to lower income compared to males. Working in the government or private sector did not have a big impact. We also found that hours worked partly explains how education affects income (mediation), and that sex slightly changes the strength of the education-income link (moderation). These findings gives us better understanding of the factors that shape people's earnings in the United States.

Keywords: *Income, Education, Occupational Prestige, Hours Worked, Sex, Social Inequality.*

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I. INTRODUCTION

How come some people in America make alot of money, while others work just as hard but still don't get that much? This is a question that matters. Having more money means you can live in a better house, eat healthier and better food, get good healthcare, and even take vacations. People with less money often struggle. They may not have steady jobs or may live in unsafe neighborhoods. This paper wants to find out why some people get paid more than some people, even when they might have similar jobs or skills.

In this study, I look at five things that might explain income differences. First is education, or how many years spent at school. Then there's gender, which means if they are male or female. The next thing is how many hours they work in a week. Fourth is how respected their job is, like if it's seen as a high or low position in society. Finally, I check if they work for the government or for a private company. I got my data from the General Social Survey (GSS), a big national survey that asks people many questions about their jobs, lives, and beliefs. I want to know what really affects how much people earn.

Some people say the more school you go to, the more money you make. That idea is quite popular. Parents, teachers, and even politicians says this alot. But is that always true? What about people who finished college but still do not earn a lot? Or people who dropped out and now run their own businesses? It seems like there is more to the story. That's why I also look at things like gender, job type, job respect, and how much someone works (Carnevale 2011).

People have been talking about the gender pay gap for years. Even when men and women have the same jobs and same school levels, men often get paid more. Why is that? Is it fair? And do women get the same value from going to school as men do? That is part of what I want to find out.

Some jobs looks like they are better than others. People think doctors and engineers have high status, but what about janitors or people who work in fast food? Do these opinions matter when it comes to pay? Do people in respected jobs always get paid more? This study will look at whether job respect really matters for income.

Also, working for the government is different than working for a company. Government jobs might not pay the most, but they are often more stable and has more job security. Private jobs may pay more but can be risky. Do these job types change how much someone earns?

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➢ *Research Questions:*
- Does going to school for more years help people earn more money?
- Do things like work hours, job respect, and public or private jobs help explain why people earn different amounts?
- Does gender change the effect of education on income?

➢ *Hypotheses:*
- People with more years of schooling earn more money.
- People with high-respect jobs, who work more hours, or who work in private jobs earn more.
- Gender changes how much benefit people get from education.

➢ *Why this Study Matters*

Money affects everything. Where you live, what you eat, and how long you live. It even affects your children's future. So when some people always earn more, it is a big deal. If two people do the same job but are paid differently just because of gender or where they work, that's unfair. By studying these issues, we can find ways to fix them. Maybe there can be better laws, or maybe we can better understand who needs help.

This study is also important because it looks at all these factors together. A lot of research only looks at one thing at a time. But real life is more messy. People are affected by many things at once. Education, gender, job type, and work hours all mix together. This paper tries to look at all of them together.

I also use real data. The GSS survey asks thousands of people across the country questions. That makes the results stronger. We can learn what is really happening, not just what we think is happening.

Every day, people think about things like, Should they go back to school? Should they work extra hours? Should they switch jobs? If we know what factors really affect income, we can make smarter choices. That helps people live better lives. That's why this study is useful.

II. LITERATURE REVIEW (WHAT OTHERS HAVE FOUND)

A lot of studies say school helps people earn more. Card (1999) found that each year of school means a bit more money. Oreopoulos and Salvanes (2011) found similar things. Schooling helps people get better jobs and earn more. This idea is also linked to what Becker (1964) called "human capital." That means people gain value when they learn skills in school. Like tools in a toolbox, more school gives you more tools to do better work.

However, school isn't the whole story. Blau and Kahn (2017) showed that men earn more than women, even if both have the same degree. That shows gender still plays a big part in pay. Women might work hard and have a good job, but still make less.

Work hours matter too. People who work more hours often get more money. But this isn't simple. Some people cannot work more. They might have kids or other responsibilities. Budig and England (2001) talked about the "motherhood penalty." Women who have kids often earn less, even if they work just as hard. That shows how gender and family shape income too.

Another thing to talk about is job respect. Hauser and Warren (1997) said jobs are ranked by how respected they are. Doctors, engineers, and professors rank high. Jobs like cashiers or cleaners rank low. These rankings often match pay, but not always. Some respected jobs, like teachers, don't always pay much. So job respect and income are linked, but not perfectly.

Job type matters too. Bender and Elliott (2002) showed that private jobs often pay more than government jobs. But government jobs give more benefits and are safer. So people choose jobs based on more than just money. Still, job type can affect income.

Race also plays a part. Wilson (2012) found that Black and Hispanic workers often earn less than White workers, even if they have the same education. That means race affects income too. This paper doesn't focus on race, but it's important to mention as well.

Other scholars have looked at how where someone lives also affects income. Chetty et al. (2014) explained that people growing up in certain neighborhoods have less chance of earning more than their parents. So place matters, not just personal effort or schooling. Living in a poor or rich area can make a difference in job chances and pay.

Another study by DiPrete and Buchmann (2013) looked at how gender and education are closely related. They found that women now attend college more than men, but they still face differences in salaries. This shows that even when women "do everything right," the system does not reward them equally.

Sociologists like Lareau (2011) also talked about class and how parents pass on advantages. Middle-class kids learn how to talk to teachers, apply for jobs, and ask for help. These skills help them earn more later in life. So education is more than just school years. It's also about what families teach and how people use what they learn.

In summary, all this research shows that many things shape income. School matters, gender matters, race, job type, respect, hours, family, and location. These factors work together and affect each other. This paper uses new data to study how these pieces fit together and to help explain income gaps in the U.S.

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➢ *Data and Measures*

This paper uses data from the General Social Survey (GSS), which is a national survey of adults in the United States. The GSS collects answers from people about many parts of their lives, like family, work, beliefs, and money. It has been done for many years, but not all questions appear every year. So, this paper uses GSS data from different years depending on when the questions based on the variables were asked. The GSS is a good source because it includes a lot of responses across the country. You can find the GSS data here: https://gss.norc.org/

The main thing this paper looks at is income. That is the dependent variable, and in the GSS it is called "rincom16." The question asks: "In which of these groups did your earnings from your job, from all sources for 2015 fall?" The answers go from under $1,000 to $170,000 or more. The answers are in order but not exact amounts, so income is treated as an ordinal variable in this study.

The first thing we think might affect income is education. This variable is called “educ.” It shows how many years of school a person finished or what degree they earned. This is a continuous variable because each extra year of school is a number. People with more education usually get better jobs and earn more. That’s why we expect education to be a strong predictor of income.

The next variable is the number of hours a person worked last week. The GSS asks people, "How many hours did you work last week at all jobs?" This variable is called “hrs1.” It is continuous too. Someone who works more hours is likely to earn more. So, we think this will help explain differences in income.

Another variable is job prestige, which is called “prestg10.” It gives each job a score from 0 to 100 based on how respected it is. For example, doctors usually get high scores, and jobs like janitor get lower scores. We expect that people with higher prestige jobs will earn more. This is a continuous variable.

We also included whether someone works for the government or a private company. The variable for this is “wrkgovt.” People are asked if they work for the federal, state, or local government or for a private company (like a business or nonprofit). This is a nominal variable, because the answers are in categories. We are curious to know if government workers earn more or less than those in private jobs.

Finally, we look at the person’s sex. In the GSS, this is called “sex.” It is a nominal variable. Males are coded as 1 and females as 2. Usually, in regression models, one group is used as the reference, which is males. So, the model compares females to males in how income changes. This variable is included to help us see if there are income differences between men and women.

For this study, I did not change or recode any of the variables. All variables were used just as they appear in the GSS. This helps make things simple and easy to follow, and it also means the results reflect what the survey really asked.

The data was analyzed using Stata, which is a program that helps with doing statistics. Both bivariate and multivariate regression models were used. Bivariate analysis looks at the relationship between two variables at a time, like income and education. Multivariate analysis looks at how all the independent variables together can explain income. This way, we get to see how each factor works while also controlling for others.

These variables education, hours worked, job prestige, whether someone works in government or not, and sex help give a full picture of what affects income in the U.S. The next section will talk about the methods used to study this.

III. ANALYSIS AND RESULTS

At the beginning of the analysis, we looked at the descriptive stats of all the variables used. Table 1 shows the descriptive stats, like the mean, standard deviation, minimum and maximum for continuous variables, and percentages for the nominal ones. The average income score for respondents was 16.91 (SD = 5.96), showing that most people earned between $40,000 and $49,999 before taxes. On average, respondents completed about 14.15 years of school (SD = 2.91), meaning many had some college. For hours worked in a week, the average was about 39.94 hours (SD = 14.09). Occupational prestige scores had an average of 44.92 (SD = 13.57), meaning people mostly had middle-ranking jobs. Looking at nominal variables, about 46.29% were male and 53.71% were female. Around 19.47% worked for the government and 80.53% for private companies.

Table 1

Descriptive Statistics				
Variable	**Mean/Percentage**	**Std. Dev.**	**Min**	**Max**
Dependent variable				
Income (rincom16)	16.91	5.96	1	26
Predictors				
Education (educ)	14.15	2.91	0	20
Hours Worked (hrs1)	39.94	14.09	0	89

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Occupational Prestige (prestg10)	44.92	13.57	16	80
Sex (1=Male, 2=Female)				
Male	46.29%	-	-	-
Female	53.71%	-	-	-
Govt or Private Employment (wrkgovt1)				
Govt	19.47%,	-	-	-
Private	80.53%	-	-	-

N=1599

After describing the variables, we did regressions using OLS in Stata. First, we ran a bivariate regression (Model 1), then a multivariate regression (Model 2) adding all independent variables. After that, we tested for moderation (Model 3) with an interaction term between sex and education. Finally, we did mediation analysis (Model 4) checking if hours worked mediates the link between education and income.

Table 2

Multiple Regression Results				
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
	(Bivariate) b (SE)	**(Multivariate) b (SE)**	**(Moderation) b (SE)**	**(Mediation) b (SE)**
Focal Predictor				
Education	0.726 (.047) **	0.442 (.047) **	0.743 (.056) **	0.716 (.041) **
Other Predictors				
Sex (Female)		-1.757 (.237) **	-4.348 (1.178) **	
Hours Worked (hrs1)		0.104 (.009) **		1.232 (.081) **
Occupational Prestige		0.128 (.010) **		
Govt or Private (wrkgovt1)		-0.024 (.314) (ns)		
Interaction Term				
Female x Education			0.137 (.080) (p=.084)	
Model Fit				
Total R^2	0.131	0.324	0.178	0.226
ΔR^2				

N = 1,566

All entries are unstandardized regression coefficients.

Dependent variable: Income
Model 1: bivariate regression between education and income.
Model 2: multivariate regression adding other predictors.
Model 3: moderation model including interaction between sex and education.
Model 4: mediation model with education and hours worked predicting income.
**p < .05; **p < .01.

➢ *Bivariate Regression*

The bivariate regression (Model 1) showed that education was positively related to income (b = 0.726, SE = 0.047, p < .01). This means every extra year of schooling increases income score by about 0.73 units. The R^2 was 0.131, meaning education explains about 13.1% of the changes in income.

➢ *Multivariate Regression*

In the multivariate regression (Model 2), after controlling for sex, hours worked, occupational prestige, and government/private job, education still predicted income (b = 0.442, SE = 0.047, p < .01). The effect was smaller than in Model 1, showing that part of the relationship is explained by other things.

Hours worked was also significant (b = 0.104, SE = 0.009, p < .01), meaning people who work more hours earn more. Occupational prestige mattered too (b = 0.128, SE = 0.010, p < .01). Being female was linked to earning less money than males (b = -1.757, SE = 0.237, p < .01). Working for the government vs private company didn't have a significant effect.

The R^2 increased to 0.324 here, meaning together these factors explained 32.4% of the difference in income.

➢ *Moderation Analysis*

Model 3 looked at whether sex changes how education affects income. The interaction (Female x Education) was close to significant (b = 0.137, SE = 0.080, p = 0.084). For males (reference group), each year of education increased income by 0.743 units. For females, the effect was a little stronger, but not by much.

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➢ *Mediation Analysis*

In Model 4, we tested if hours worked mediates the link between education and income. Education predicted more hours worked, and more hours worked predicted more income (b = 1.232, SE = 0.081, p < .01). Education still predicted income (b = 0.716, SE = 0.041, p < .01), but part of the effect was through hours worked. This shows a partial mediation.

The R^2 for this model was 0.226, meaning 22.6% of the change in income is explained by education and hours worked together

Table 3

Predicted Scores Table

Education Level	Sex	Predicted Income Score
12th Grade	Male	17.30
12th Grade	Female	15.55
4 Years College	Male	19.07
4 Years College	Female	17.32

➢ *Predicted Values*

We used margins to predict income scores at two education levels (12 and 16 years) for males and females. As seen in the graph (Figure 1), at 12 years of education, predicted income was 17.30 for males and 15.55 for females. At 16 years, predicted income rose to 19.07 for males and 17.32 for females. The gap stays, but narrows a little at higher education.

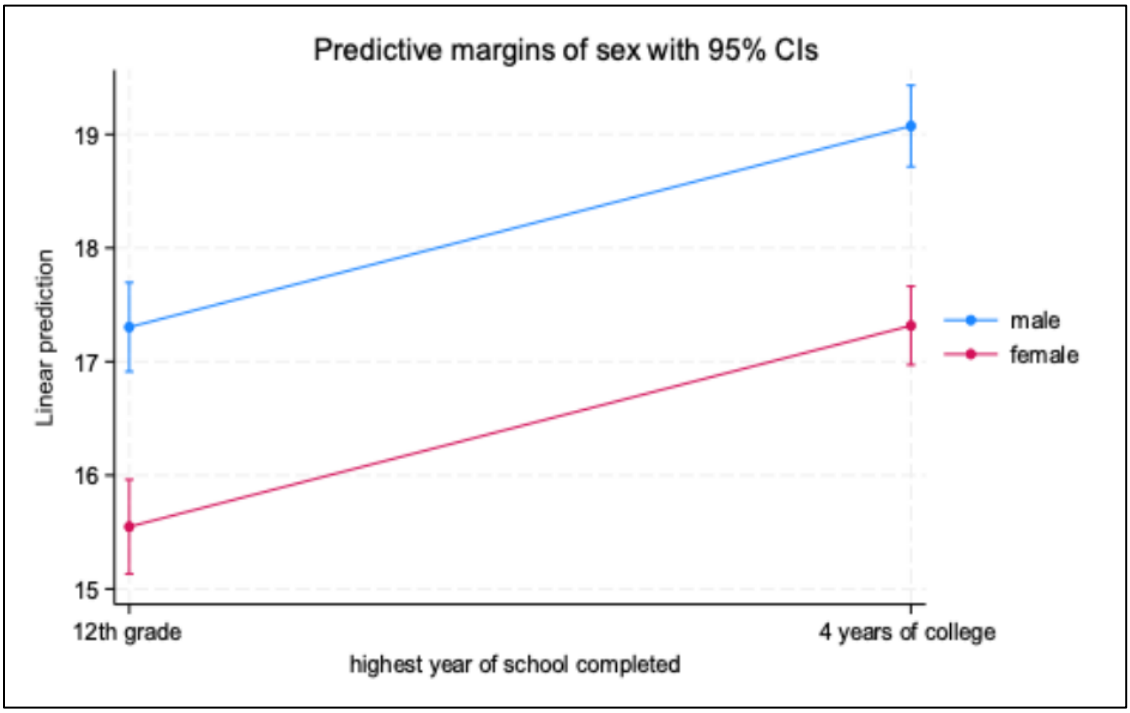

Fig 1 Predicted Income Scores by Education Level and Sex

IV. SUMMARY OF RESULTS

In a nutshell, the results show strong evidence that more education leads to higher income. Hours worked and occupational prestige also matter. Being female was linked to lower income, even when looking at everything else. The moderation effect of sex was small and not strong. The mediation analysis showed that working more hours partly explains why education leads to higher income.

V. DISCUSSION AND CONCLUSION

This paper looks at how income is affected by things like education, hours worked, job prestige, sex, and type of employer (government or private). Based on what we found in the data, some things are very important for income, and others are not so much.

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First, education came out as a big factor. The more years of school someone has, the more money they are likely to make. Even when we added other variables like sex and how many hours they work, education still had a strong effect. This tells us that education helps people get better-paying jobs, maybe because of more skills, better job options, or better chances of promotions. This supports many earlier studies that say school is a good way to increase earnings.

Secondly, hours worked and occupational prestige also showed strong effects. People who work more hours or have higher-prestige jobs tend to earn more. That makes sense because if you work more, you usually get paid more, and if your job is seen as more important in society, it often comes with higher pay. These findings match what other researchers have said before too.

One interesting finding was about sex. Even after controlling for everything else, being female was linked to lower income. This shows that there are gaps between men and women in regards to income, even when they have similar education, jobs, and work hours. We also tested whether the effect of education on income was different for men and women. The results were not very strong, but they did show that maybe education helps women a little more. Still, the difference wasn't big enough to be sure. Even though, as a result of these findings gotten from secondary data, there is no opportunity to know why or understand the reason behind this, which is very interesting to note.

We also tested if hours worked could explain part of the connection between education and income. That is, does going to school help people get higher-paying jobs *because* they end up working more hours? Our test showed that this is true to some extent. People with more education do tend to work more hours, and that helps raise their income. But even when we looked at this, education still had a direct effect, so it isn't just about hours worked.

The prediction graph we made also showed clear differences. At both 12 and 16 years of education, men earned more than women. But the gap became a little smaller at higher education levels. This could mean that school helps reduce income gaps by sex, though not fully.

Overall, our study shows that income is shaped by several things. Education, work hours, and job prestige matter a lot. Being female is linked to lower earnings, which points to possible inequality. Also, education seems to help people earn more partly by helping them get jobs where they work more or have higher status. These results give support to policies that promote access to education and help women earn fair wages.

VI. LIMITATIONS AND FUTURE RESEARCH

Like any research, this study is not perfect. One big limit is that we used survey data, and people sometimes give wrong answers or skip questions. Also, this data is only from certain years, and the results may not show how things change over time. We also treated income as if it was measured exactly, but in truth, it was a range. This could affect the accuracy of our results.

Another limit is that we didn't control for some other things that could matter. For example, we didn't look at job industry, region, or race, all of which can affect income. Also, while we tested for mediation and moderation, there could be other variables that explain or change the relationships we saw.

For future research, it would be good to add more variables, like race or job type, and to look at trends over time or even make it a longitudinal study for better results. It would also help to do studies that follow the same people over many years. That way, we can see how education, job prestige, and work hours affect income as people move through life. Lastly, more work is needed to understand why women still earn less than men and what can be done to fix that.

In conclusion, this paper showed that income is connected to education, work, job prestige, and sex. Even with its limits, the study gives useful ideas for future work and for thinking about how to make income more fair for everyone.

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