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Income Mobility in the United States

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Abstract

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An extended treatment of this topic was awarded University Honors and may be found in the Department of Economics Honors Projects collection.

Keywords

standard of living, youth, income mobility, income inequality

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This study makes use of the National Longitudinal Survey of Youth (NLSY) in order to examine the relationship between the standard of living one experiences as a youth and their income as an adult. Human capital theory, as well as previous empirical research in economics suggests that as standard of living as a youth increases, future income as an adult should increase as well. The 1979 cohort as well as the 1997 cohort of the NLSY were studied in order to provide insight into how the relationship in question has changed over time. I hypothesize that as standard of living as a youth increases, so too will income as an adult. Furthermore I hypothesize that the level of income mobility will be greater for the 1979 cohort than the 1997 cohort.

I. Introduction

Income mobility is an area of economics that has a broad range of impacts on people in the United States, especially those in poverty. Recently, there has been much media attention given to the issue of income inequality and its moral and policy implications. Income inequality has risen to the forefront of the issues for the 2016 presidential campaign, with a number of politicians opening up about the importance of the issue (Lauter, 2015). This reflects the general population's dissatisfaction with the current state of the country as it pertains to income inequality. There has been a corresponding amount of attention paid to this subject in economic literature. The 2015 Nobel Prize in economics was awarded to Angus Deaton, for his work on welfare and poverty. The Nobel committee awarding Deaton the Nobel Prize indicated that promoting welfare and reducing poverty is of high importance. Uwe E. Reinhardt, a colleague of Deaton, stated, "American economists did not focus on income inequality because it was very inconvenient for them

to do so," referring to the 1970's (Timiraos, 2015). Today that is not the case given the amount of economic literature that has been published on the subject in recent years.

It is well known that many people worldwide think of America as the land of opportunity. Some statistics today seem to dispute that assertion. For example, following the economic crisis of 2008, Emmanuel Saez found that in the first three years of recovery 91% of the income gains went to the top 1% of earners (Lauter, 2015). Are people born into situations that prohibit them from entering this top 1 percent or even the middle class? If the answer to this question is yes, then it seems like the notion that America is the land of opportunity may not be true for some who grew up in poverty. The goal of this study is to determine how much the standard of living that one experiences as a youth influences income and wages as an adult. This will act as a measure of income mobility across generations. This relationship will be established for two different cohorts of survey respondents from the National Longitudinal Survey of Youth (NLSY) in order to examine how this relationship has changed over time. These two cohorts began surveying in 1979 and 1997 respectively. The research question of this paper is the following: What is the relationship between the standard of living that one experiences as a youth and their income as an adult? This paper will attempt to answer this question using. The reason for doing this twice is to explore whether intergenerational income mobility has changed from 20 years ago until now. First, the relationship between standard of living as a youth and income as an adult will be established for the 1979 NLSY cohort, and then again for the 1997 NLSY cohort. The results of the two cohorts will be compared to see how they differ. Human capital theory, as well as published empirical research in economics shows support for the expectation that there should be a relationship between standard of living as a youth, and income as an adult.

II. Theory and Literature Review

There has been a great deal of research done on the subject of income inequality and income mobility. Scholars have attempted to address ways in which one can describe and model income inequality at any particular point in time, as well as studying various methods for how transitions out of poverty may occur (Fawaz, 2014, Gottschalk, 1997, Becker, 1979, Peters, 1992). The main focus of my study is on income mobility between generations; therefore it is previous literature on the methods for transitioning out of poverty that this study is most interested in.

One of the highly cited and foundational theories in income inequality and income mobility comes from Becker and Tomes (1979). Becker and Tomes establish the idea that the current generation of a family can increase their consumption only at the expense of the future generation (Becker, 1979). In that sense, families attempt to maximize a utility function that spans multiple generations. As a result of this cross-generational utility function, families with less income will have less opportunity to invest in their children's human capital, because they will need to use those resources for more immediate needs that are vital for survival such as food and clothes. At the same time, families with more disposable income would be able to use their money to invest in their children by means of hiring private tutors, prep classes or standardized test preparation books. Based on this framework, higher levels of family income should correspond to higher human capital for youths, and therefore higher income when these youths become adults. This system perpetuates the groups of families with high human capital (and by extension high income), and causes the groups of families with low human capital (and by extension low income) to remain in their respective socioeconomic classes. This idea, coupled with human capital theory, provides the basis for the expectation that lower family income in youths' families should correspond with lower income when they are adults living on their own.

The main economic theory that my paper will draw from is human capital theory. An investment in human capital is any activity that is able to raise a worker's productivity. Human capital theory says that the higher an individual's human capital (and therefore productivity), the higher their wages should be. Families, and in particular parents, have the ability to invest in their children's human capital, in such a way indicated by Becker and Tomes (1979). In theory, the more one's parents invest in their human capital, the more productive they will be. This leads to the expectation that belonging to a family whose cross-generational utility function allows them to make investments into their children's human capital will cause higher productivity in their children, and therefore higher wages as an adult. This theory is the basis for the first research hypothesis of this paper, which is: the higher ones standard of living as a youth, the higher their income as an adult will be.

There are a number of academic research articles that also draw on human capital theory in order to study income mobility across generations. Elizabeth Peters (1992) conducted an empirical analysis that relates one's parent's income to their own income later in life. This is similar to the research question of this paper, which relates the standard of living as a youth to income later in life. Peters poses the question at the beginning of her article that she attempts to answer: "Does there exist a culture of poverty that is passed on from parents to children?" (Peters, 1992, p. 456). This is essentially the question that I hope to address as well, and the work of Becker and Tomes (1979) would suggest this to be true, as impoverished families would have less to invest in their children in terms of human capital.

The result of Peter's study is that there is a relationship between parent's income, and the income of their children in the future, but a small relationship. She finds changes in parents income account for 9% of changes in the future income for males, and 11% for females (Peters, 1992). However, I believe that the transmission may be even greater than this if a proxy of standard of living is used rather than dollar income. This is because parent's human capital investment in each child from a family of seven may be different than the investment of human capital from a family of two, given the same income level.

A study by Corcoran et al. in 1991 has also drawn from the theoretical model of human capital in order to investigate the association between men's economic status and their community origins (Corcoran, 1991). It was found that being from a low-income family, being a black man, and being from a welfare dependent family all significantly affect the economic status of men. Even after controlling for factors such as race and years of education they found an elasticity of .37 of earnings as an adult with respect

to family income when they were a child (Corcoran, 1991). It is expected that a similar relationship will hold for income and standard of living as a youth, which is the relationship that this paper hopes to establish.

In addition to the human capital that is invested in youth from parents, a college education is something that greatly affects ones future earnings. Israel and Seeborg (1998) found that educational attainment is one of the most significant factors that impact one's ability to transition out of poverty. A college education is not free however, and this is another factor that favors the children of wealthy parents. The cost of obtaining human capital by way of a college education has increased significantly since the 1970's. In 1971, the cost of tuition and fees at a public four-year institution in the United States in 2014 dollars was $2,505, and by 2014 the cost of tuition and fees had risen to $9,139 (Tuition and Fees and Room and Board Over Time). For private institutions, tuition and fees had jumped from $10,724 to $31,231 in 2014 dollars in that same time frame. The high levels of debt that students from low income families have to take on acts as a disincentive to obtain a college degree. Families with high levels of wealth that can afford college on their own will not face this same disincentive. As the cost of education is rising in the United States, this affect is expected to be more pronounced. Because of the rising cost of education in the United States, the second research hypothesis of this paper is that the 1997 cohort of NLSY respondents will show less upward income mobility than the 1979 cohort.

III. Data and Empirical Model

The database that this paper uses is the NLSY. The NLSY database has a number of potential explanatory variables that can be used to identify the effects of standard of living as a youth. A paper by Israel and Seeborg (1998) has made use of the same database to explain intergenerational modes for transitions out of poverty. This paper will make use of two different cohorts of respondents, the 1997 cohort, and the 1979 cohort. The 1997 cohort includes about 9,000 youth's ranging in age from 12 to 16 years old as of December 31st, 1996. These youths were then interviewed on an annual basis to follow them over time. The NLSY is intended to document transitions from youth into adulthood by collecting information on

educational experiences, employment experiences and a number of other topics. The NLSY has data on family income, income as an adult, and the poverty level for any given family. This will provide me with the main variables that I need to test my research hypothesis. Additionally, they have information on race and gender, which are factors that have been found to affect income in a significant way in previous literature including Corcoran et al. (1991). The 1979 cohort of the NLSY has the same information that can be used to compare the results across time. The 1979 cohort is a sample of over 12,000 youths who were between the ages of 14 and 22 when surveying began.

Determining the extent to which income as an adult is determined by standard of living as a youth is accomplished using ordinary least squares (OLS) regression. This study examines the relationship between standard of living as a youth and income as an adult in two ways. The first method uses a dummy variable for being in poverty or not being in poverty as a youth, which will be referred to as "In Poverty". This dummy variable is used as an independent variable in the regression equation to predict income as an adult. If the individual was in poverty as a youth this variable would take on the value of 1. If the individual was not in poverty as a youth this variable would become zero. The theoretical model presented in this paper suggests that the coefficient for the dummy variable "In Poverty" will be negative, as being in poverty as a youth should have a negative effect on wages as an adult. If the coefficient for "In Poverty" is negative, it would supports my first hypothesis.

The second method includes a continuous independent variable for standard of living, instead of the dummy variable for being in poverty. To proxy standard of living this independent variable, which this paper will refer to as "poverty ratio", will be the ratio of household income to the poverty level for any given family involved in the survey. The poverty level is the dollar amount of money that a family must make below in order to be declared in poverty according to the U.S government. Therefore, an increase of one in the poverty ratio can be interpreted as an increase in family income (as a youth) equal to the poverty level for that particular family. The theory suggests that the coefficient of this variable should be positive, as an increase in standard of living as a youth should increase income as an adult. If the coefficient of "poverty ratio" is positive, this will support

my first hypothesis. Other independent variables that will be included in the regression equation include dummy variables for being Hispanic, Black, or male, which have been found to affect income levels on their own. As there are two cohorts of youths, there will be two regression equations for each method stated above.

The dependent variable is the natural log of income level, which uses the NLSY data of total income from wages and salary in the past year for 2011 or 1994, for the 1997 and 1979 cohorts respectively. The natural log of total income and wages is taken in order to provide simple and intuitive explanations of the coefficients of the independent variables. For example, using the natural log of income as the dependent variable, the coefficient to the variable "Hispanic" represents the percent change in income observed as a result of being Hispanic. The coefficient of "poverty ratio" represents the percent change in income as an adult that is observed as a result of an increase in household income as a youth equal to the poverty level. I will compare the coefficients for "poverty ratio", and the dummy variable for "in poverty" in the regression equations for the 1997 cohort to the same coefficients in the regression equation for the 1979 cohort. This will provide insight into how the relationship between standard of living as a youth and income as an adult has changed over time. The regression equations can be seen below.

Regression equations:

Model 1: Ln(Income) = β0 + β1(In Poverty) + β2(HISPANIC) + β3(BLACK) + β4(MALE)

Model 2: Ln(Income) = β0 + β1(POV RATIO) + β2(HISPANIC) + β3(BLACK) + β4(MALE)

If $\beta1$ for the 1997 cohort is larger in absolute value than $\beta1$ for the 1979 cohort then the results would support the second hypothesis of this paper, which is that there is a stronger relationship between standard of living as a youth and income as an adult for the 1997 cohort, or less income mobility for the 1997 cohort than for the 1979 cohort.

IV. Results

In an effort to provide insight into what may be expected of the regression results, descriptive statistics were run for both cohorts. The statistic that is most relevant to this research is what level of income do these survey respondents obtain as an adult on average, given that they were in poverty, or not in poverty as a youth? The results of these descriptive statistics can be seen in Table 1.

Table 1: Wage and Salary Income for Adult Respondents by Poverty Status as Youth

1979 cohort

	In Poverty as a Youth	Not in Poverty as a Youth
Total income in 1994	$19,948	$25,784

1997 cohort

	In Poverty as a Youth	Not in Poverty as a Youth
Total income in 2011	$25,099	$35,764

An interesting observation from these statistics is that the income growth due to the general rise in income level that one would expect due to inflation between 1994 and 2011 is greatest for those who were not in poverty as a youth. The salary as an adult that we observe for someone who was born in poverty increased by only $5,151 between these two cohorts. At the same time, the salary we expect for someone to have as an adult, given they were not raised in poverty, increased by $9,980. This supports the claim that income inequality is on the rise. It can also be seen that in both cohorts the salary as an adult of those who were in poverty as a youth was lower than those who were not in poverty as a youth. In the 1979 cohort, the salary for people who were in poverty as a youth was $5,836 less than those who were not in poverty as a youth. In the 1997 cohort, the salary for people who were in poverty as a youth was $10,665 less than the salary for those who were not in poverty as a youth. These statistics support the first research hypothesis that standard of living as a youth impacts income as an adult. Additionally, they support the second research hypothesis that the relationship between standard of living as a youth and income as an adult is stronger in the 1997 cohort than it is for the 1979 cohort.

The results of the regression equation for method 1 is what one would expect based on these descriptive statistics. And can be seen in tables 2 and 3.

Table 2: Regression Results for the 1979 Cohort (Model 1)

Model 1 (1979)	Coefficient	Standard Error
Constant	9.645***	.021
In_Poverty	-.242***	.028
Male	.477***	.024
Black	-.252***	.029
Hispanic	-.131***	.028

R-squared Value: .082

Table 3: Regression Results for the 1997 Cohort (Model 1)

Model 1 (1997)	Coefficient	Standard Error
Constant	10.128***	.023
In_Poverty	-.361***	.038
Male	.249***	.027
Black	-.312***	.034
Hispanic	-.085**	-.034

R-Squared Value: .056

*** = Significant at the .01 level, ** = Significant at the .05 level, * = Significant at the .1 level

Table 4: Regression Results for the 1979 Cohort (Model 2)

Model 2 (1979)	Coefficient	Standard Error
Constant	9.324***	.032
Poverty Ratio	.119***	.009
Male	.473***	.027
Black	-.179***	.033
Hispanic	-.065*	.036

R-Squared Value: .097

Table 5: Regression Results for the 1997 Cohort (Model 2)

Model 2 (1997)	Coefficient	Standard Error
Constant	9.866***	.033
Poverty Ratio	.059***	.006
Male	.266***	.030
Black	-.288***	.039
Hispanic	-.022	.04

R-Squared Value: .069

*** = Significant at the .01 level, ** = Significant at the .05 level, * = Significant at the .1 level

Each of the coefficients in tables 2 and 3 are of the expected sign. It can be seen that being in poverty in 1979 led to an expected decrease in future wages of 24.2% compared to someone who is not in poverty. In 1997, being in poverty led to an expected decrease in future wages of 36.1%. These statistics being significant at the one percent level support the first hypothesis that your standard of living as a youth affects income as an adult. The regression results also suggests that the "penalty" for being in poverty for the 1997 cohort is greater than it was in the 1979 cohort. These results support the second research hypothesis that there is a stronger relationship between standard of living as a youth and income as an adult for the 1997 cohort than there was for the 1979 cohort. In other words, these results suggest less income mobility for the 1997 cohort. The results of method 2 show similar, but slightly different results and can be seen in tables 4 and 5. Note that method 2 is the same as method 1 except that it replaces the dummy variable In_Poverty with the continuous variable POV_RATIO.

As is expected by theory, both table 4 and table 5 show an increase in income as an adult for an increase in standard of living as a youth. In 1979, for an increase of one times the poverty level (which is a certain dollar amount for any given family), there is an increase in earnings as an adult of 11.9%. For the 1997 cohort, an increase in income of one times the poverty level as a youth corresponds to an increase of 5.9% in income as an adult. These results support the first research hypothesis of this paper, which is for an increase in standard of living as a youth there will be an increase in income as an adult. When the regression was run with a continuous dependent variable for standard of living (poverty ratio), as opposed to a dummy variable (in poverty) however, we observe a stronger relationship between standard of living as a youth in the 1979 cohort than we saw for the 1997 cohort ($\beta 1$ for 1979 cohort is larger than $\beta 1$ for the 1997 cohort). This result goes against the second research hypothesis of this paper that there will be less income mobility for the 1997 cohort.

V. Conclusions

The results of this study support the first hypothesis proposed, that the higher one's standard of living as a youth, the higher their income as an adult will be. For all four regressions there was a positive and statistically significant relationship between standard of living as a youth and income as an adult, either as a dummy variable or a continuous variable. These results are expected within the framework of human capital theory. They support the theory that families with more disposable income are able to invest more in their children, which will raise their human capital, and therefore their wages. An explanation for these results in the context of the model provided by Becker and Tomes (1979) is that when maximizing the cross generational utility functions, families in this study with more income were able to invest more heavily in their children's human capital, while still tending to their immediate needs. Along with being in agreement with the theory, these results are similar to the results of studies done previously. Peter's paper asked the question, "Does there exist a culture of poverty that is passed on from parents to children?" (Peters, 1992, p. 456). The result of Peter's study is that changes in parent's income can explain about 10% of changes in income as adults for their children. This suggests that the answer to the question posed is yes. My study also suggests that there is a culture of poverty that is passed on from parents to children. The results of the study conducted by Corcoran et al. (1992) were that being from a low-income family had negative effects on future income. My study is in agreement with those results.

Additionally, this study resulted in a counterintuitive result, that when applied to the regression as a dummy variable, standard of living showed a stronger relationship with income for the 1997 cohort. This means that the 1997 cohort displayed less income mobility in model 1. However, when included in the regression as a continuous variable, standard of living displayed a stronger relationship with income for the 1979 cohort. This means that the 1979 cohort showed less income mobility in model 2. There are a number of potential explanations for this, including potential non-linearity in the data. It is possible that after a certain level of family income, there are no more returns to the child in terms of human capital. This would be a situation of diminishing marginal returns. In other words, at very low levels of family income, there would be very high returns to a one unit increase of human capital investment, however for families with high levels of family income, there would be lower returns for the same amount of human capital investment. It is possible that this non-linearity occurs at different income levels in the two different cohorts. This will be explored further in future research. Another explanation for the difference in the results of the two models when comparing the 1979 and 1997 cohorts is that the variable "In_Poverty" only focuses on the bottom of the income distribution, while the variable "POV_RATIO" captures the movements all along the income distribution.

A result relevant to income inequality and injustice is that those who grew up in poverty effectively have to endure a penalty with respect to income as an adult. A policy action that could help relieve that burden would be to help the impoverished with investments in human capital that they cannot make on their own. This could take the form of free exam preparation, tutors, or even making sure schools have access to the same books and other resources regardless of location. One policy that would level the playing field in this way would be to fund public schools through tax income at the state level evenly, as opposed to funding them through taxes locally. This system causes the schools in high income areas to have access to the best resources, when in reality it may be the schools in low income areas who need access to those same resources even more.

In the future, this work will be expanded upon to see how standard of living as a youth impacts educational attainment, and how this in turn impacts future earnings. This will use education as an indirect pathway that affects earnings. If it is the case that once education levels are accounted for, there is no significant relationship between standard of living as a youth and income as an adult, it would suggest that low income families are not getting access to the same levels of education than high income families. This result could lead to different policy implications.

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