NCES Data Institute – Project Executive Summary June 2019

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Topic: Socioeconomic Status (SES)

Dataset: Educational Longitudinal Study (ELS) of 2002

Elevator Pitch: Education is a key component to social mobility in the U.S. Using publicly available data from ELS:2002, our study examines how education relates to employment income. To this end, we conducted a series of multiple regression analyses examining how income relates to background characteristics, high school, and postsecondary factors. We additionally conducted sub-group analyses for respondents from low-income backgrounds and respondents who have parents without a four-year degree. We found that significant factors vary when data are disaggregated by parental education and family income. While we acknowledge that there is no single solution to income inequality, our findings have important policy implications for how institutions and policy makers target and serve students in their educational and career pathways.

Research Question and Dataset(s): This study used nationally representative data on sophomore participants in the Educational Longitudinal Study (ELS) of 2002. Because students' educational pathways diverge, ELS collected data from all participants at four time points between 2002 and 2012 (see Appendix D). Our team strategically chose the ELS 2002 data set as it includes participants who did not choose to enter postsecondary education. Additionally, this time series captured a large number of millennials. Millennial students have faced stagnant salaries, reduced intergenerational wealth and increasing student debt loads, making an investigation of post college income an important part of the picture for social mobility. Our guiding questions were:

1. To what extent do various background, high school, and postsecondary factors relate to employment income?
2. How do these factors vary for students from different socioeconomic backgrounds?

Brief Literature Review: A plethora of literature attempts to quantify the economic return to education. Beginning in high school, several factors predict a student's income mobility including a student's region of origin (Chetty et al., 2014) and its rurality (Koricich et al., 2018). Beyond these high school considerations, researchers have found substantial economic benefits for obtaining a college degree. In 2015, the median earnings of bachelor's degree recipients are $24,600, or 67%, higher than those who only have a high school diploma (Ma et al., 2016). Chetty et al. (2017) found that colleges have an important role in facilitating income mobility. Researchers have found that students who are least likely to obtain a college education benefit the most from college (Brand & Xie, 2010). Nonetheless, there are employment earnings differences based on race and ethnicity (Espinosa et al., 2019), biological sex (Hout, 2012), the level of the degree (Hershbein & Kearney, 2017), and the type of college first attended (Monk-Turner, 1994). Our study builds on this literature through an examination of factors that relate to employment income among students from different socioeconomic backgrounds.

Method of Analysis: We used NCES PowerStats to conduct a series of multiple regression models to explore determinants of 2011 employment income for ELS:2002 sophomores. We included up to 28 independent variables that represent background characteristics, high school,

and college factors. Our primary regression model included all participants and controlled for specific socioeconomic factors. Two sub-group analyses examined data from students who have parents without a 4-year degree and those who came from the lowest income group.

Results and Interpretation: Respondents' average 2011 income was approximately $25,000 (see Appendix A for all descriptive statistics). In our first regression model, the 28 independent variables explained 10% of the variance in 2011 income. Statistically significant regression coefficients are listed in the infographic in Appendix B. Important highlights are as follows:

- Compared to males, females reported incomes nearly $8,000 lower on average. Lower income averages for females was the only factor significant across all three models.
- Students with a high school GPA of 3.01 or higher reported average incomes that were approximately $6,000 higher than that of their peers with a GPA at or below 2.0.
- Obtaining a bachelor's degree was associated with an increase in income of approximately $3,000 compared to individuals without a postsecondary degree.
- Students in the highest income groups ($100,001-$200,000+), earned on average between $4,000 to $6,000 more compared to the lowest income group ($0-$25,000).
- Attendees of private, not-for-profit postsecondary institutions reported incomes that were on average more than $3,000 higher than those who attended a public institution, while attendees of for-profit institutions reported incomes that were on average $2,000 lower.
- Earning a postsecondary credential in science or engineering was not a significant predictor of income.

Significant regression coefficients from our sub-group analyses are displayed in Appendix C. Our second regression model analyzed the 2011 income of students who have parents without a 4-year degree. Comparison of findings revealed notable differences with the prior model:

- Individuals with a post-baccalaureate certificate or graduate degree reported average incomes that were typically $5,000 higher compared to their peers without a bachelor's degree.
- Black/African American individuals reported incomes approximately $3,000 compared to White students.
- Total family income, high school region, and control of the postsecondary institution (private/for-profit) were not significant.

For our third model, we focused on students with a total family income in 2002 that was below $25,001. Again, some results were similar to prior models, but differences included:

- Individuals with a post-baccalaureate certificate or graduate degree earned an estimated $14,000 more than students without a bachelor's degree.
- Race/ethnicity, high school region, high school GPA, and institutional control were not significant.

Limitations and Next Steps: There are limitations to our study. The results are intended to be descriptive and should not be interpreted as causal factors for income mobility. Due to small sample sizes, we had to collapse Native American/Alaska Native with more than one race. We also recognize that the 2011 income variable does not account for spousal income or the number of dependents in the household.

References

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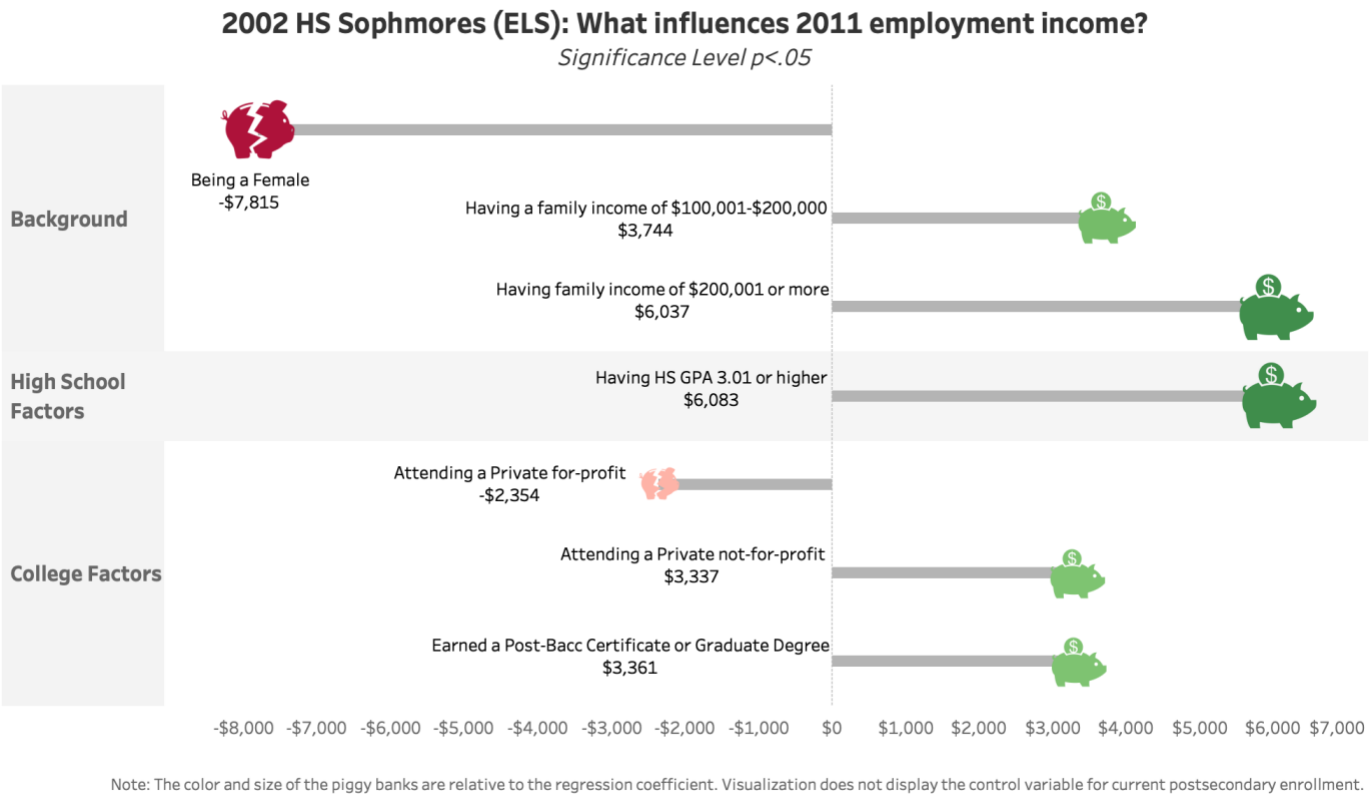
Appendix A. Table 1. Average 2001 Employment Income by Subgroups.

	2011 employment income
Total	25,154.83
Geographic region of school	
Northeast	27,517.84
Midwest	25,933.27
South	23,800.83
West	24,436.03
School urbanicity	
Urban	23,489.95
Suburban	26,079.86
Rural	25,304.34
Sex	
Male	28,779.90
Female	21,658.58
Student's race/ethnicity	
Asian, Hawaii/Pac. Islander,non-Hispanic	27,242.54
Black or African American, non-Hispanic	19,880.31
Hispanic	21,662.33
White, non-Hispanic	27,489.04
Other	21,817.26
Control of last/currently attended PS institution	
Public	25,966.26
Private not-for-profit	32,084.32
Private for-profit	20,728.24
Highest level of education earned as of F3	
Undergraduate certificate or less	20,979.75
Associates degree	25,159.98
Bachelor’s degree	33,208.41
Post-baccalaureate certificate or graduate degree	30,079.57
Ever earned a postsecondary credential in a science & engineering field	
No credential in science or engineering	28,978.93
Science or engineering credential	31,503.98
Total family income	
$25,000 or less	19,849.08
$25,001-$35,000	23,458.56
$35,001-$50,000	23,972.13
$50,001-$75,000	26,708.22
$75,001-$100,000	28,430.74
$100,001-$200,000	30,991.05
$200,001 or more	33,701.20
GPA for all courses taken in grades 9-12	
2.00 or less	18,917.21
2.01 to 3.00	23,304.05
3.01 to 4.00	30,648.71
Postsecondary enrollment status as of the F3 interview	
Currently enrolled in PS education	21,455.29
Not enrolled in PS education	26,307.29
Parent's highest level of education	
Less than 4-year degree	23,350.19
Bachelor's degree	27,956.00
Higher than a bachelor's degree	28,257.37

Appendix B.


2002 HS Sophmores (ELS): What influences 2011 employment income?
Significance Level p<.05
Background
High School Factors
College Factors
Being a Female
-$7,815
Having a family income of $100,001-$200,000
$3,744
Having family income of $200,001 or more
$6,037
Having HS GPA 3.01 or higher
$6,083
Attending a Private for-profit
-$2,354
Attending a Private not-for-profit
$3,337
Earned a Post-Bacc Certificate or Graduate Degree
$3,361
-$8,000 -$7,000 -$6,000 -$5,000 -$4,000 -$3,000 -$2,000 -$1,000 $0 $1,000 $2,000 $3,000 $4,000 $5,000 $6,000 $7,000
Note: The color and size of the piggy banks are relative to the regression coefficient. Visualization does not display the control variable for current postsecondary enrollment.

Appendix C. Table 2. Regression Models Predicting 2011 Employment Income.

Outcome Variable: 2011 Employment Income (highlighted coefficients were significant at p<.05 or lower)

	All Students	Parents with no 4-year Degree	Lowest Parental Income Group
Intercept	20357.67	22898.84	24652.31
Background Factors			
Female	-7815.03	-9153.54	-11623.63
Asian, Hawaii/Pac. Islander, non-Hispanic	569.47	-4727.34	-2194.39
Black or African American, non-Hispanic	-1664.48	-3317.95	-2009.56
Hispanic	-1629.59	-1262.39	-1545.06
Other race/ethnicity group	-1376.31	-1266.88	-7085.65
Family income: $25,001-$35,000	2042.35	1566.57	
Family income: $35,001-$50,000	386.09	-242.97	
Family income: $50,001-$75,000	2389.05	2016.57	
Family income: $75,001-$100,000	1862.15	403.50	
Family income: $100,001-$200,000	3743.54	3337.17	
Family income: $200,001 or more	6036.85	5067.15	
Parents attained less than a Bachelor's degree	-346.31		878.21
Parents attained higher than a Bachelor's degree	-1376.70		-397.78
High School Factors			
Northeast	1780.95	1795.03	3470.48
Midwest	1052.31	1522.49	868.98
West	132.69	-75.45	1126.68
Urban	-1389.82	-738.21	-2551.70
Rural	312.45	267.59	2696.62
GPA 2.01-3.00	875.63	2013.11	1082.51
GPA 3.01 or higher	6083.45	6620.19	4171.19
Postsecondary Factors			
Private not-for-profit (last attended institution)	3337.46	2614.97	-1218.02
Private for-profit (last attended institution)	-2353.71	-2378.09	-2556.92
4-year college/university (last attended institution)	1687.05	220.87	81.11
Highest level of education: Associate's	512.74	1012.70	1396.38
Highest level of education: Bachelor's degree	3361.16	4145.26	7113.76
Highest level of education earned: Post-baccalaureate certificate or graduate degree	-871.76	4996.33	13787.73
Credit in a Science or Engineering field	-945.69	-1128.39	-2567.20
Not Currently Enrolled	7064.31	4396.42	3429.12
R2	0.10	0.11	0.12
Coarsened N	6600	3000	900

Note: Highlighted coefficients were significant at p<.05. Green highlights positive coefficients and red are negative values.
Note: Other race/ethnicity group includes Native American/Alaska Native and students representing more than one race/ethnicity.

Comparison groups include White (for race/ethnicity), $25,000 or less (for family income), Southeast (for high school region), Suburb (for high school urbanity), 2.00 or lower (for high school GPA), Public (for control of last attended postsecondary institution), less than four-year college (for level of last attended postsecondary institution), and no postsecondary degree (for highest level of educational attainment).

Appendix D. Table 3. ELS:2002 Data Collection Timeline.

ELS 2002 Data Collection Timeline by Academic Pathway

ELS 2002 Year	No Degree	Associate Degree	BA (100%)	BA (150%)	BA (200%)	Non Traditional Academic Path
2002 (Base Year)	HS*	HS	HS	HS	HS	HS
2003	HS	HS	HS	HS	HS	HS
2004 (First follow-up data collection)	HS	HS	HS	HS	HS	HS
2005	HS	HS	HS	HS	HS	HS
2006 (Second follow-up data collection)	1****	AD**	BA***	BA	BA	BA
2007	2	AD	BA	BA	BA	BA
2008	3	1	BA	BA	BA	BA
2009	4	2	BA	BA	BA	BA
2010	5	3	1	BA	BA	1
2011	6	4	2	BA	BA	AD
2012 (Third follow-up data collection)	7	5	3	1	BA	AD

Note: HS*: High School;

AD**: Associate Degree;

BA***: Bachelor Degree;

1***: 1 Year after the highest degree earned.