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Bullying and human capital accumulation:
Evidence from the National Longitudinal Survey of Youth, 1997

By Jessica Lum

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of the requirements for the degree of
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Abstract

The effect of bullying on human capital accumulation in the form of years of educational attainment, employment and income is explored using the National Longitudinal Survey of Youth, 1997 (NLSY97). I apply an ordered probit estimation to determine the effects of risk factors on the probability of being bullied during the years until one turns 12, or long term in which one is bullied repeatedly throughout one's adolescence until age 18. To discover the risk factors on being ever experiencing bullying, I employ a probit estimation as well. From these estimates, I construct a model of two stage residual inclusion (2SRI) to account for endogeneity within the bullied status regressor, in order to ascertain the effects that victimization has on the highest degree earned of an individual. An employment equation is estimated as a multinomial logit to estimate the effects of victimization on employment outcomes. Using this estimation, I calculate inverse mills ratios for inclusion in the ordinary least squares (OLS) estimation of the income equation for the purpose of negating potential sample selection bias. Empirical findings suggest that experiencing bullying has more of a negative impact on an individual's education than any other factor considered, compared to those who were never bullied. Moreover, the impact of bullying prevails in adulthood, where those who are continuously bullied until age 18 experience a statistically and practically significant decrease in income, compared to those who were never bullied. Therefore, I find that victimization has an adverse effect on income as well as indirectly influencing future outcomes through decreased educational attainment.

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1. Introduction and background

According to the Education and Synthetic Work-Life Earnings (2011), which uses data from 2006 to 2008 from the *American Community Survey* to study the effects of educational attainment on the amount one might earn over a 40-year work-life, education levels effect earnings more “than any other demographic factor, such as gender, race and Hispanic origin.” In this paper, I investigate the effects of one factor, which has been mostly overlooked in economic literature, on educational attainment in the United States: bullying.

A pioneer in the study of bullying and its effects, Olweus, 2003, defines bullying as repeated unwanted aggressiveness towards an individual who has difficulty or is unable to defend one’s self, resulting in an imbalance of power. He outlines different types of bullying such as verbal, physical, racial, sexual and cyber, and bullying through theft. In addition, he states that bullying can take social forms such as exclusion and spreading false rumors.

Bullying as a detriment to child well-being, has gone all but unnoticed by federal agencies. The *2011 School Crime Supplement (SCS) to the National Crime Victimization Survey (NCVS)*, sponsored by the National Center for Education Statistics and the Bureau of Justice Statistics, which reports statistics for students in the U.S. ages 12 through 18 for the for the school year 2010-2011, states that 28% of U.S. students in grades 6 through 12 were victims of bullying. The Centers for Disease Control and Prevention, reported in their *Youth Risk Behavior Surveillance (YRBS)*, which investigates major factors in health-risk behaviors among youth and young adults between September 2012 and December 2013, state that 20% of U.S. students in grades 9 through 12 were bullied. Additionally, during the year before individuals were surveyed for the YRBS, “14.8% had been electronically bullied, 19.6% had been bullied on school

property, and 8.0% had attempted suicide.” They find that during this same period, bullying was reportedly more prevalent among females than males across race (black white, Hispanic), and grades (9th through 12th) on school property. The SCS statistics supports this higher prevalence for females relative to males. Additionally, the SCS reports that White (non-Hispanic or Latino) students in the U.S. have higher rates of being bullied than any other race, higher rates of bullying for 6th graders than 7th through 12th grades, higher rates for students in public schools, higher rates for those in income categories less than \$35,000, with the exception of the income category of \$35,000-\$49,000, and higher rates for mixed race individuals relative to those who report only one race category. Regardless of gender, race, grade (6th through 12th) or household income, bullying in the form of non-physical aggression (insults and rumors) was more common than physical aggression.

Although there is no federal law against bullying, an *Analysis of State Bullying Laws and Policies*, published by the U.S. Department of Education states that 46 states have implemented anti-bullying laws implying an underlying need to address the issue. The subject of bullying has attracted international interest. Craig and Harel (2009) found that in a sample of more than 200,000 school aged children, between 8.6 to 45.2% of boys and 4.8 to 35.8% of girls from 40 European, North-American countries and Israel were exposed to bullying.

Bullying can have negative effects on human capital accumulation. Victims of bullying are at risk of having lower attendance rates, a loss of interest in schoolwork and consequently lower grades (Unicef, 2007). Bullying is seen to have adverse effects on academic performance in fourth graders and in eighth graders in Italy (Ponzo, 2013), and Brown and Taylor (2008) find that bullying adversely impacts educational attainment in high school youths and adulthood in

the form of a decreased probability of earning a degree and that bullying is significantly negatively correlated with earnings among individuals in the UK.

Schooling decisions and labor market outcomes are affected by cognitive as well as non-cognitive skills (Heckman, Stixrud, and Urzua, 2006). Insofar as bullying may have an adverse effect on non-cognitive skills, one's labor market decisions and outcomes may be correlated with repeated victimization. Therefore, bullying may have both a direct influence on an individual's well-being and academic performance at school-age and indirectly as an adult in the form of lower wages.

Given the numerous effects of victimization on school-aged children, it is surprising that the subject has received limited attention in economic literature, especially in the United States. In contrast, the subject has been studied extensively in psychology literature.¹ Hills, Huebner and Moore (2012) note that being a victim of electronic bullying is correlated with an individual's grades and overall life satisfaction. College students in the U.S. who were either victims in the past or are currently being victimized, self-reported having a lower motivation to succeed academically and those who were past victims can have academic struggles in the future (Byrket, Fursa, Young-Jones, and Sly, 2014). Victims of bullying may have trouble adapting to changes later in life². "We see evidence of longitudinal connections between peer victimization and poor adjustment in academic, social, self, physical, internalizing, and externalizing domains." (McDougall and Vaillancourt, 2015). This may be explained by economic theories of life-cycle skill formation. Skill attainment in childhood reinforces skills attained in later years so that

¹ For example, *Four Decades of Research on School Bullying: An Introduction*, presents findings from the past forty years of research in the subject of bullying victimization. (Hymel & Swearer, 2015)

² Also, see, for example, Wolke, Copeland, Angold, and Costello (2013), who find that victims of bullying are at risk "for being impoverished in young adulthood and having difficulty keeping jobs."

return on investment in skills at earlier stages of life are high and that remediation of past inadequate investment in childhood skill attainment is costly (Cunha, Heckman, Lochner, and Masterov, 2006). In this sense, any reduction in academic achievement due to a decline in non-cognitive skills after victimization can have lasting harmful effects in lifetime productivity and can be costly to reverse.

In this paper, I aim to add to existing literature through revealing the effects of school bullying on human capital accumulation within the bounds of the US. Specifically, I attempt to discover the effects of certain risk factors on victimization status and to explain some of the variation in educational attainment between individuals, as well as the variation between individuals' incomes in 2013. I exploit the National Longitudinal Survey of Youth: 1997 (NLSY97), which annually surveys American youths, ages 12-17 in 1997 until the latest survey round in 2014, and biennially henceforth, which allows for analysis of the effects of being victimized on their subsequent educational attainment and labor market outcomes. In addition, I distinguish between those who are either repeatedly victimized before age 12 or repeatedly victimized between ages 12 and 18, henceforth one-period bullied individuals, as well as those who are bullied in both periods, henceforth both-period individuals. This paper will be structured as follows: Section 2 describes the dataset and controls used in various equations to be estimated. Section 3 investigates the determinants of both the level of bullying, and the likelihood of ever being bullied in one's lifetime using an ordered probit and probit estimation, respectively. Section 4 examines the effects of bullying on one's highest degree earned, accounting for endogeneity in the bullying status variables through two stage residual inclusion, which utilizes the residuals calculated from Section 3. In Section 5, I explore the effects of bullying on employment status. I calculate inverse mills ratios in from this estimation for

inclusion in the income equation to account for selection bias that arises due to missing income information of those who are not employed.

2. Data

The *NLSY97* is a national survey of children born between 1980 and 1984 living in the United States. Their ages ranged from 12 to 18 at the time of interview in the first survey round in 1997. As of 2013, their ages ranged from 28 to 34 with a retention rate of 79.5%. The response rate of those who reported never being bullied is approximately 75%. The response rate of those who reported being repeatedly bullied when they were under 12 years of age is approximately 19%. The response rate of those who reported being repeatedly bullied both under the age of 12 and between the ages of 12 to 18 is approximately 4%. Approximately 99.9% of respondents answered the questions pertaining to bullying. Therefore, there is no concern for sample selection bias about selection into different victimization groups due to potential missing information.

The *NLSY97* contains information about the individual's experience with victimization, their school experience and educational attainment and grades, family background, as well as labor market outcomes. Summary statistics of the full set of variables can be found in Table 1 in the Appendix. Table 2.1 illustrates the percentage of individuals in each level of highest degree earned, and employment status in 2013 by levels of bullying. Table 2.2 gives the mean wages of different educational attainment levels and employment status, by victimization status. Of those who were never bullied, 42.52% had a high school diploma as their highest educational outcome, vs. 45.07% and 46.48% for one-period individuals and two-period individuals, respectively.

Income in 2013 for those whose highest educational level was high school, was similar for those who were never bullied and one-period individuals. Two-period individuals had a mean wage of roughly 3,000 dollars (USD) less than their peers in the same educational attainment level. When considering those who have a Bachelor's degree, 19.76% of individuals who were never bullied reported having a Bachelor's degree as their highest degree earned, compared with 15.01% and 15.33% for one-period and two-period individuals, respectively. Of these Bachelor's recipients, "never bullied" individuals and one-period individuals shared a similar mean income in 2013, about \$49,000 and \$50,000, respectively. In contrast, two-period persons had a mean income in 2013 that was approximately \$41,000. The data reveals that adults who were never bullied have relatively better employment outcomes if they were never exposed to bullying. A higher percentage of individuals who were never bullied reported being employed in 2013, versus their bullied peers, who had a lower percentage of employment relative to those who were unemployed and out of the labor force. Furthermore, employed individuals who were never bullied had a higher mean income in 2013 than both categories of their bullied peers.

Readers should note certain limitations of the data. Estimation of the various independent variables may rely on retrospective answers, which may lead to misrepresentation of past situations or experiences of the respondents in the survey. For example, asking individuals whether or not they broke school rules occurred in the 2008 survey round, which is 5 years after the survey round in which the last question on bullying was administered. The question in the survey regarding whether an individual was repeatedly bullied before the age of 12 occurred in the initial, 1997 survey round. The question regarding whether an individual was repeatedly bullied between the ages of 12 and 18 were asked in the 1999-2003 survey rounds. Therefore, characteristics tied to the likelihood of being bullied rely on any information from before 1997,

until 2003. In addition, questions on experiences with bullying do not determine at what exact age the individual was bullied. Because of the unbalanced nature of the existing dataset which occurred when queries are administered in selected rounds, some of the controls used in estimation are from different years. Therefore, I include variables that were derived from year(s) between 1997 to 2003, inclusive, and impose the assumption that these characteristics do not change between the time an individual is bullied, until 2003. For variables in which information from multiple years exist, averages are employed in estimation.

3. Determinants of bullying

3.1 Methodology

Potential issues with analyzing the influence of bullying on educational and labor market outcomes derive from the possibility that bullying can be correlated with unobserved factors, i.e. personality and innate ability, which would bias estimates. In order to avoid biased results, I instrument bullying with factors meant to proxy these unobserved characteristics. I model an individual's experience of school bullying as an ordered probit model as follows:

$$\text{bulliedordered}_i = G'_i \lambda_1 + \varepsilon_{i1}, \quad (1a)$$

$$\text{bulliedbinary}_i = G'_i \lambda_2 + \varepsilon_{i2}, \quad (1b)$$

where bulliedordered_i takes on values of 0, 1 and 2, and distinguishes between those who were never bullied from one-period individuals and two-period individuals. The variable

bulliedbinary_{*i*} is equal to 1 if the individual has ever been bullied and 0 otherwise. The vector G_i contains explanatory variables which may influence the probability of the level of bullying one is categorized in. Within this vector, the individual characteristics include cognitive ability, as measured by the Armed Services Vocational Aptitude Battery (*ASVAB*) which measures mathematical reasoning, arithmetic reasoning, word knowledge, paragraph comprehension, and verbal score, a quadratic for the ASVAB score, the total number of schools attended, the average poverty ratio of the household³, age, gender, whether the individual has ever had a homosexual experience⁴, a retrospective indicator for whether the individual reported breaking rules when one was in attendance at school, an index for whether the individual had mental health problems⁵ - where higher scores indicated more positive mental health and lower scores represented more emotional problems, the total amount of fights one had at school, race, equal to 1 if Black, 2 if Hispanic, 3 if mixed-race (Non-Hispanic), and 4 if Non-black/ Non-Hispanic, citizenship status, whether the person was fluent in English⁶, an ordered variable for whether the individual reported self describing her weight on a scale of 1 through 5, where 1 represents “very underweight” and 5 represents “very overweight”, and a categorical variable indicating whether or not the individual does something about her weight - equal to 1 if she is trying to lose weight,

³ Poverty ratio is calculated as the ratio of household income to poverty level in the previous survey year. The average was used to incorporate information for the years during which the question on bullying experience was asked: 1997-2003. Therefore, the average poverty ratio is the sum of poverty ratio between 1997 and 2003, inclusive, divided by 7.

⁴ The value of the variable homosexual is equal to 1 if the individual has ever dated, had sex with, or had reported having a partner of the same sex; 0 otherwise.

⁵ The youth mental health scale was created using self reported answers to other questions based on whether or not the person was a nervous person, how often in the past month the person reported being calm, downhearted and blue, happy, or “felt so down in the dumps that nothing could cheer you up”. See *NLSY97: Codebook Supplement*, Appendix 9 for more details.

⁶ English fluency was determined by the interviewer, who reported for each individual whether their “command of English” was poor.

2 if she is trying to gain weight, 3 if trying to stay the same weight, and 4 if she is not trying to do anything about her weight. The self-report of describing one's own weight as well as describing whether or not the individual chooses to change her weight is used to proxy confidence levels as those with lower confidence levels may be seen as easier targets for aggression.⁷

3.2 Results

Results from the estimation of Eq. (1a) are given in columns 1-3 of Table 3.1 and results from the estimation of Eq. (1b) are given in column 4 of Table 3, where the average marginal effects associated with the probability of each level of bullying and the probability of ever being bullied are shown. Factors that increase the probability of being bullied include *ASVAB* scores, the total amount of schools attended, the total amount of fights one has been in, being male, being homosexual, breaking school rules, and being of an older age. Increases in *ASVAB* scores (given that they are in the higher range of scores), having a higher average poverty ratio, being female, having a higher score on the mental health index, describing one's weight in a moderate light, relative to describing one's weight as very underweight and individuals who reported trying to gain weight, or stay the same weight relative to those who try to lose weight, are significantly negatively correlated with being bullied. The significance of the modest self-reported description of weight signifies that those who are confident or moderately confident in

⁷ Dominance theory seeks to explain aggressiveness, for example, bullying, as a strategy to assert dominance in social groups in order to seem more attractive to male peers as a potential friend and more attractive to females as potential dates, especially when reorienting themselves in a new environment with a new hierarchy of status. See, for example, Pellegrini & Bartini, 2001, and Pellegrini & Long, 2002.

their weight tend to have a lower likelihood of being bullied. This is reinforced further by the decreased likelihood of being bullied if an individual does not feel the need to change themselves via weight or if the person is trying to gain weight, which indicates that individuals who feel the need to lose weight may not have confidence levels on par with their peers and are therefore more likely to be bullied. The way weight is described by an individual has the largest magnitude in average marginal effect on bullying status. Describing one's self as slightly underweight, about the right weight, and slightly overweight is approximately associated with a 9%, 10%, and 8% decrease in the probability of being bullied for one-period individuals. The effects of describing one's self in the same manner is associated with a 15%, 17% and 13% decrease in the probability of ever being bullied in one's lifetime. Therefore, compared to the other variables, the proxy for confidence level in the way individuals describe themselves, impacts victimization status the most, although the actions taken based on weight affect bullying probability by roughly less than %5.

In order to determine the influence on confidence level, Eq. (1a) and (1b) are estimated with the omission of the confidence proxies (the way an individual describes their weight, and the actions taken based on weight).

Table 3.2 presents estimates from estimation without confidence proxies and reveals that estimation with confidence proxies results in marginally less precise coefficients due to increased standard errors. The Pseudo R-squared is higher in the estimation of the equations with the proxies. Additionally, Chi-squared values for goodness-of-fit is higher in the estimation with the proxies, along with both estimations having a p-value close to 0.

Table 3.3 presents raw estimates of coefficients from estimation of Eq. (1a) and (1b) with confidence proxies (columns 1 and 3), and without confidence proxies (columns 2 and 4) and

make comparisons between the bulliedordered_i equations (columns 1 and 2), and between the bulliedbinary_i equations (columns 3 and 4). Log-likelihood values of the full models reveal slightly higher likelihood values in the estimation excluding the confidence proxies, however the likelihood ratio statistics are higher in the estimations including the proxies. Akaike information criterion (AIC) are lower for estimations with the proxies than without. Bayesian information criterion (BIC) values are lower for estimations with the proxies than without by a value more than 10. Therefore, I conclude that the more appropriate models to employ, in both the ordered and binary cases, are those with the proxies.

4. Bullying and educational attainment

4.1 Methodology

In order to analyze how the level of victimization, and any experience of victimization affect human capital accumulation in the form of educational attainment, I specify an ordered probit model:

$$e_i = \alpha_1 \text{bulliedordered}_i + X'_i \omega_1 + \psi_1 \hat{\varepsilon}_{i1} + \hat{\varepsilon}_{i3}, \quad (2a)$$

$$e_i = \alpha_2 \text{bulliedbinary}_i + X'_i \omega_2 + \psi_2 \hat{\varepsilon}_{i2} + \hat{\varepsilon}_{i4}, \quad (2b)$$

where e_i is the individual's highest degree earned differentiating between having no degree, a GED, a high school diploma, an Associate's degree/degree from a Junior college (AA), a Bachelor's degree (B.A./B.S.), a Master's degree (M.A., M.S.), a PhD, and a Professional degree

(D.D.S., J.D., and M.D.). The vector X'_i is a vector of explanatory variables that include the highest grade completed of the individual's residential father and mother, the average index of family routines as reported by the youth⁸, the average poverty ratio, *ASVAB* scores, a quadratic term for *ASVAB* scores, overall high school GPA, gender, race, age, whether the individual reads for fun, the total amount of fights in school, total amount of schools ever attended, a mental health index, and the youth's report of their residential mother's and father's parenting style, differentiating between whether the parent is uninvolved, permissive, authoritarian, or authoritative. The factors $\hat{\varepsilon}_{i1}$ and $\hat{\varepsilon}_{i2}$ are the predicted residuals from Eq. (1a) and Eq. (1b), respectively. This allows us to use the control function approach to account for endogeneity in the victimization variables, using the explanatory factors in Eq. (1a) and (1b) as excluded instruments⁹.

Tables 4.1 and 4.2 display summary results of average marginal effects of Eq. (2a) and (2b), respectively. Residuals from both equations of Section 3 are significant, indicating that the variables representing bullying status are endogenous and omission of these residuals would cause our models of educational attainment to be misspecified. The ordered bullied variable is not significant, suggesting that the intensity of bullying does not influence educational attainment. The binary variable for bullying is significant in explaining selection into all categories of educational attainment except for the "AA" category. Individuals who have ever been bullied have an increased likelihood of having not attained any degree, a GED, or a High school diploma and a decreased likelihood of having degrees past a High school diploma. For

⁸ The index is calculated using a self report of the individual of the number of days per week spent in routine activities with the family. The average is calculated using the index reported for survey years 1997-2000.

⁹ Wooldridge, 2010, p.660-662, defines the control function approach to instrumental variables methods for nonlinear equations. Kaiser and Spitz, 2000 page 13 Eq. 5 and Akdviik, Salvanes, and Vaage, page 20, Eq. 4 show calculation of the generalized residual after estimation of a 1st stage ordered probit model.

example, having experienced bullied increases the likelihood of having a lifetime highest degree earned as a High school diploma by approximately 45%, and decreases the likelihood of having a lifetime highest degree earned of a Bachelor's degree and Master's degree by approximately 30% and 27%, respectively.

5. Bullying and labor market outcomes

5.1 Methodology

Finally, I analyze the effect of bullying on labor market outcomes, specifically, employment status during the last week of, and income, in 2013. Because we only observe wages for those who are employed, we model employment status with as a multinomial logit to derive the inverse mills ratios, and include them in the equation for income in 2013 in order to avert any potential sample selection bias. Our income regression is modeled by ordinary least squares (OLS):

$$E_i = \beta_1 \text{bulliedordered}_i + F'_i \varphi + \varepsilon_{i5}, \quad (3)$$

$$I_i = \beta_0 + \beta_2 \text{bulliedordered}_i + Z'_i \theta + R'_i \pi + \varepsilon_{i6}, \quad (4)$$

Where E_i represents employment status in the last week of 2013, differentiating between unemployed, employed, self-employed, and out of the labor force. Vector F_i contains factors such as gender, race, marital status, the amount of children one has, an indicator for whether the person reports being limited in kind or amount of work, general health status, household size in

2013, highest degree earned and the total weeks worked in a tenured position. I_i represents income in 2013, the vector Z_i includes variables such as age, race, gender, whether the individual has computer skills, whether the individual has a university or technical degree, firm size, industry type, occupation type, weeks tenured as of 2013, weeks tenured squared, marital status in 2013, and hours worked in 2013. The vector R_i includes the inverse mills ratios (IMRs), calculated using Eq. (3), to avoid selection bias¹⁰.

5.2 Results

Table 5.1 illustrates the average marginal effect of each variable on the probability of being in different employment status categories. Victimization status is not significant in explaining variation in employment status across individuals. Females are approximately 4% less likely to be employed, 10% more likely to be out of the labor force, and 6% more likely to be self-employed than males. Individuals who reported being separated from their partners are 25% more likely to be employed, 10% less likely to be out of the labor force and 12% less likely to be self-employed, relative to those who were never married. Having a reported general health status of good or fair increases the likelihood of being employed by about 7% and 8%, respectively. As expected, having a high school diploma or higher degree increases the likelihood of being employed, compared to those with no diploma/degree. Having a Bachelor's degree, a Master's degree, a PhD, or a professional degree increases the likelihood that one is employed by roughly 15, 21, 52, and 33 percent, respectively. As one would expect, being limit in kind or amount of

¹⁰ Bourguignon, Martin Fournier, Marc Gurgand (2004) page 7, Eq. (2.6), describe calculation of IMRs after a multinomial logit model, based on Dubin and McFadden (1984), is estimated.

work, having a large household, and having a professional degree increases the likelihood of being self-employed. Race plays no role in explaining differences in employment status.

Table 6.1 illustrates the summary results from estimation of Eq. (4). Column 1 presents reference estimates, attained after estimation of Eq. (4) on all the regressors, except those in vector R_i (the IMRs). Column 2 estimates Eq. (4) including the IMRs, and reveals that two of the IMRs are significant. We reject the hypothesis of joint significance of the IMRs, suggesting that omission of the IMRs would result in biased and inconsistent results. As a comparison, the sample selection model is estimated with a full set of interactions, testing down the variables until the only interaction effect that is significant is that of the income differential between men and female of different victimization experiences. Table 6.2 presents a comparison of the main coefficients of interest between the general model with sample selection in column 1, and the model including the interaction effect, in column 2.

Both the model with and without the interaction effect include jointly significant IMRs. Focusing on the model without interactions, two-period individuals have a statistically significant decrease in income of roughly \$7,400 at the 1% significance level, compared to those who were never bullied, whereas two-period individuals earn a statistically significant (at the 0.1% level) amount of \$12,500 less than those who were never bullied in the interaction model. Although females earn approximately \$10,000 less than males in the model without interaction, the interaction model reveals that the decreased coefficient coupled with the increase in variance causes the coefficient on the gender to fail to be significantly different from 0. In addition, the interaction effect reveals that those who are one-bullied females earn \$14,000 less than males who were never bullied. The magnitude of the remaining coefficients and significance of the same variables are similar across the two estimations. An adjusted R-squared value that is

marginally higher in the model with the interaction effect, compounded with a lower root mean squared error value indicates that the model with the interaction effect is more appropriately specified than the model without the interaction.

6. Conclusion

As the findings suggest, being bullied may be associated with decreases in human capital accumulation in the form of decreased educational attainment, where those who are bullied have a lower likelihood of achieving education past the high school level. Although bullying does not have a direct effect on employment status, it indirectly affects levels income earned of those who were victimized. Furthermore, victimized females tend to earn statistically and economically significantly less than males with no experience of bullying. Overall, those who are bullied throughout their lives until they reach age 18 earn more than \$12,000 less than those who never had a long history of victimization. Combining results that indicate victimization status plays no role in affecting employment outcomes, with the finding that income is influenced by repeated victimization suggests that bullying has negative implications on future productivity and that in the long run, affects females more than males. Caution should be taken in interpreting the findings as causal. The assumption imposed in that certain characteristics remain unchanged between the time they were bullied and 2003 may not be valid from a practical standpoint. Individuals who were ages 12 to 18 in 1997 would have been 17 to 23 in 2003. Assuming individuals had no personal growth during the transition from childhood to adolescence to young adulthood is likely implausible. Additionally, true determinants of bullying would have to be derived from a survey round prior to 1997, which does not exist. Another danger exists in

interpreting results as causal due to potential simultaneity, which may exist in the educational attainment equation. Although bullying may cause lower levels of education attained, characteristics that contribute to differences in educational attainment may also be correlated with why an individual is bullied. For example, individuals who have low levels of educational attainment may have a personality trait that contributes to an increase in the likelihood of being bullied. Using self-reported description of weight and actions taken based on weight in order to proxy confidence levels can partially control for personality, however many other traits determine one's personality, therefore a suggestion for future analysis would be to control for major dimensions of personality such as degrees of extraversion, agreeableness, conscientiousness, neuroticism and openness¹¹. One instrument that can potentially break the correlation between the error term in Eq. (1) and Eq. (2), and solve the simultaneity issue, is a variable that represents the total amount of siblings who are bullied. If the amount of siblings bullied is highly correlated with one's own likelihood of being bullied, and also uncorrelated with one's potential educational attainment level, then we can more precisely estimate the effect of being bullied on educational outcomes¹². Ideally, future research should employ the use of panel data, following individuals closely from a young age, in order to account for increasing marginal changes of personality at earlier stages of life, and possibly surveying individuals on their bullying experiences past schooling years and through adulthood. Given the findings that bullying is significantly correlated with decreases in the probability of an individual attaining

¹¹ The Big-Five trait taxonomy: History, measurement, and theoretical perspectives, John, O. P., & Srivastava, S. (1999) trace out these major dimensions which are further characterized by certain characteristics. For example, extraversion is measured by one's levels of gregariousness, assertiveness, activity, excitement-seeking actions, positive emotions, and warmth.

¹² Although the *NLSY97* includes information that allowed for generation of this instrument, inclusion of this instrument decreased the observations in the estimation significantly, giving possibly inconsistent estimates.

education levels past a high school diploma, and the effect of education on labor market outcomes in the form of employment status and income, further research should be made into victimization and its effects throughout adolescence and adulthood, and policies should continue to address such concerns.

Table 2.1

Educational attainment and Employment by Victimization status

	Never Bullied		Bullied: One period		Bullied: Two periods	
	%	%	%	%	%	%
Highest Degree Earned						
None (n=1,052)	11.75	12.46	8.79	11.76		
GED (n=1,103)	11.63	14.40	14.82	12.33		
High School diploma (12 year program) (n=3,865)	42.52	45.07	46.48	43.21		
Associate/Junior college (AA) (n=667)	7.40	7.64	7.54	7.46		
Bachelor's degree (BA, BS) (n=1,664)	19.76	15.01	15.33	18.60		
Master's degree (MA, MS) (n=471)	5.46	4.49	5.53	5.27		
PhD (n=30)	0.34	0.22	0.75	0.34		
Professional degree (DDS, JD, MD) (n=93)	1.14	0.72	0.75	1.04		
Employment Status in 2013						
Employed (n=2,182)	58.97	54.78	47.67	57.59		
Unemployed (n=122)	2.97	3.82	4.65	3.22		
Out of Labor Force (n=588)	15.25	15.67	19.19	15.52		
Self-Employed (n=897)	22.81	25.73	28.49	23.67		
Total (n=8,975)	100.00	100.00	100.00	100.00		

Table 2.2

Mean Wages by Educational attainment, Employment, Victimization status

	Never Bullied		Bullied: One period		Bullied: Two periods	
	\$	\$	\$	\$	\$	\$
Highest Degree Earned						
None (n=1,052)	22821.89	20944.56	31736.36	22673.96		
GED (n=1,103)	26284.86	25755.02	23575.67	26028.34		
High School diploma (12 year program) (n=3,865)	33654.91	33647.64	30583.49	33507.80		
Associate/Junior college (AA) (n=667)	38826.77	34286.06	38203.95	37834.33		
Bachelor's degree (BA, BS) (n=1,664)	48978.60	49965.08	41019.92	48828.03		
Master's degree (MA, MS) (n=471)	53173.37	55462.68	42868.75	53155.60		
PhD (n=30)	51366.55	111777.00	47333.33	57871.62		
Professional degree (DDS, JD, MD) (n=93)	91695.91	108360.33	43966.67	92495.70		
Total (n=8,945)	38784.50	37428.40	33856.96	38291.40		
Employment Status in 2013						
Employed (n=2,182)	41749.51	40846.60	36684.35	41395.69		
Unemployed (n=122)	26048.27	18484.59	34666.67	24443.16		
Out of Labor Force (n=588)	22136.72	16787.45	20712.50	21080.99		
Self-Employed (n=897)	38055.96	39957.43	34528.97	38276.36		
Total (n=3,789)	39261.58	38495.01	34791.96	38923.40		

Table 3.1
Average Marginal Effects by Victimization Status
Inclusion of confidence proxies

	(1) Never Bullied	(2) Bullied: One period	(3) Bullied: Two periods	(4) Ever Bullied
ASVAB score (%)	-0.00364*** (0.000876)	0.00251*** (0.000604)	0.00113*** (0.000280)	0.00367*** (0.000911)
ASVAB score squared(%)	0.0000257** (0.00000832)	-0.0000177** (0.00000573)	-0.00000800** (0.00000263)	-0.0000261** (0.00000865)
Total schools attended	-0.0328*** (0.00625)	0.0225*** (0.00431)	0.0102*** (0.00203)	0.0306*** (0.00658)
Average Poverty Ratio (1997-2003)	0.0000930*** (0.0000277)	-0.0000640*** (0.0000191)	-0.0000290*** (0.00000880)	-0.000103*** (0.0000288)
Fights at school	-0.0187*** (0.00433)	0.0129*** (0.00300)	0.00583*** (0.00138)	0.0250*** (0.00515)
Female	0.0811*** (0.0140)	-0.0559*** (0.00963)	-0.0253*** (0.00460)	-0.0809*** (0.0145)
Citizenship Status	-0.0339 (0.0213)	0.0233 (0.0147)	0.0106 (0.00667)	0.0362 (0.0220)
Fluent in English	-0.0484 (0.0873)	0.0333 (0.0601)	0.0151 (0.0272)	0.0348 (0.0883)
Homosexual	-0.0660** (0.0253)	0.0455** (0.0174)	0.0206** (0.00796)	0.0766** (0.0266)
very underweight	ref.	ref.	ref.	ref.
slightly underweight	0.152* (0.0606)	-0.0930** (0.0331)	-0.0586* (0.0279)	-0.148* (0.0648)
about the right weight	0.169** (0.0591)	-0.105*** (0.0317)	-0.0640* (0.0277)	-0.172** (0.0631)
slightly overweight	0.132* (0.0606)	-0.0796* (0.0327)	-0.0524 (0.0282)	-0.133* (0.0647)
very overweight	0.102 (0.0666)	-0.0602 (0.0371)	-0.0423 (0.0299)	-0.113 (0.0707)
lose weight	ref.	ref.	ref.	ref.
gain weight	0.0439* (0.0220)	-0.0302* (0.0152)	-0.0138* (0.00682)	-0.0457* (0.0228)
stay the same weight	0.0430* (0.0188)	-0.0295* (0.0130)	-0.0135* (0.00590)	-0.0482* (0.0194)
not trying to do anything	0.0344 (0.0187)	-0.0234 (0.0128)	-0.0109 (0.00594)	-0.0315 (0.0195)
Broke school rules	-0.00928** (0.00308)	0.00639** (0.00212)	0.00289** (0.000976)	0.0106** (0.00321)
Age	-0.0201*** (0.00432)	0.0138*** (0.00298)	0.00625*** (0.00140)	0.0173*** (0.00450)
Black	ref.	ref.	ref.	ref.
Hispanic	0.0357 (0.0202)	-0.0252 (0.0144)	-0.0105 (0.00589)	-0.0320 (0.0211)

Mixed Race (Non-Hispanic)	-0.112 (0.0695)	0.0710 (0.0403)	0.0411 (0.0294)	0.104 (0.0729)
Non-Black / Non-Hispanic	-0.00967 (0.0168)	0.00662 (0.0116)	0.00304 (0.00528)	0.00720 (0.0175)
Youth mental health scale	0.0188*** (0.00255)	-0.0130*** (0.00177)	-0.00587*** (0.000864)	-0.0176*** (0.00267)
Observations	4249	4249	4249	4249
Pseudo R^2	0.044	0.044	0.044	0.050
Chi-squared	256.5	256.5	256.5	242.3
p-value	7.05e-42	7.05e-42	7.05e-42	4.92e-39

Higher scores on the youth mental health scale indicate more positive mental health.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.2
Average Marginal Effects by Victimization Status
Exclusion of confidence proxies

	(1) Never Bullied	(2) Bullied: One period	(3) Bullied: Two periods	(4) Ever Bullied
ASVAB score (%)	-0.00351*** (0.000869)	0.00242*** (0.000601)	0.00109*** (0.000276)	0.00355*** (0.000903)
ASVAB score squared(%)	0.0000243** (0.00000828)	-0.0000168** (0.00000572)	-0.00000751** (0.00000260)	-0.0000246** (0.00000860)
Total schools attended	-0.0329*** (0.00623)	0.0227*** (0.00431)	0.0102*** (0.00201)	0.0308*** (0.00655)
Average Poverty Ratio (1997-2003)	0.0000962*** (0.0000275)	-0.0000664*** (0.0000190)	-0.0000298*** (0.00000870)	-0.000106*** (0.0000285)
Fights at school	-0.0170*** (0.00412)	0.0117*** (0.00286)	0.00525*** (0.00130)	0.0245*** (0.00509)
Female	0.0623*** (0.0132)	-0.0430*** (0.00909)	-0.0193*** (0.00423)	-0.0621*** (0.0137)
Citizenship Status	-0.0348 (0.0213)	0.0240 (0.0147)	0.0108 (0.00662)	0.0371 (0.0220)
Fluent in English	-0.0509 (0.0865)	0.0351 (0.0597)	0.0157 (0.0268)	0.0389 (0.0873)
Homosexual	-0.0710** (0.0251)	0.0490** (0.0174)	0.0220** (0.00787)	0.0820** (0.0264)
Broke school rules	-0.0102*** (0.00306)	0.00701*** (0.00211)	0.00314** (0.000966)	0.0115*** (0.00319)
Age	-0.0202*** (0.00430)	0.0139*** (0.00297)	0.00625*** (0.00138)	0.0179*** (0.00447)
Black	ref.	ref.	ref.	ref.
Hispanic	0.0303 (0.0201)	-0.0215 (0.0143)	-0.00884 (0.00583)	-0.0265 (0.0209)
Mixed Race (Non-Hispanic)	-0.122 (0.0703)	0.0774 (0.0403)	0.0450 (0.0302)	0.115 (0.0738)
Non-Black / Non-Hispanic	-0.0119 (0.0166)	0.00818 (0.0115)	0.00370 (0.00514)	0.00914 (0.0172)
Youth mental health scale	0.0198*** (0.00251)	-0.0137*** (0.00174)	-0.00614*** (0.000853)	-0.0186*** (0.00262)
Observations	4323	4323	4323	4323
Pseudo R ²	0.038	0.038	0.038	0.044
Chi-squared	225.6	225.6	225.6	215.1
p-value	1.27e-39	1.27e-39	1.27e-39	1.78e-37

Higher scores on the youth mental health scale indicate more positive mental health.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.3

(1) & (2) Determinants of level of bullying

(3) & (4) Determinants on likelihood of ever being bullied Raw coefficients

	(1) Confidence Proxies	(2) Confidence Proxies	(3) No Confidence Proxies	(4) No Confidence Proxies
ASVAB score (%)	0.0120*** (4.14)	0.0121*** (4.01)	0.0115*** (4.02)	0.0116*** (3.91)
ASVAB score squared(%)	-0.0000846** (-3.08)	-0.0000863** (-3.01)	-0.0000795** (-2.93)	-0.0000808** (-2.86)
Total schools attended	0.108*** (5.20)	0.101*** (4.62)	0.108*** (5.25)	0.101*** (4.67)
Average Poverty Ratio (1997-2003)	-0.000307*** (-3.35)	-0.000339*** (-3.56)	-0.000315*** (-3.48)	-0.000348*** (-3.70)
Fights at school	0.0617*** (4.30)	0.0827*** (4.83)	0.0555*** (4.10)	0.0803*** (4.78)
Female	-0.268*** (-5.76)	-0.267*** (-5.52)	-0.204*** (-4.70)	-0.204*** (-4.51)
Citizenship Status	0.112 (1.59)	0.120 (1.64)	0.114 (1.63)	0.122 (1.69)
Fluent in English	0.159 (0.55)	0.115 (0.39)	0.167 (0.59)	0.128 (0.45)
Homosexual	0.218** (2.61)	0.253** (2.87)	0.232** (2.82)	0.269** (3.09)
very underweight	ref.	ref.		
slightly underweight	-0.444** (-2.66)	-0.431* (-2.42)		
about the right weight	-0.504** (-3.14)	-0.511** (-2.98)		
slightly overweight	-0.381* (-2.30)	-0.383* (-2.17)		
very overweight	-0.290 (-1.57)	-0.321 (-1.63)		
lose weight	ref.	ref.		
gain weight	-0.144* (-1.97)	-0.150* (-1.97)		
stay the same weight	-0.141* (-2.27)	-0.158* (-2.46)		
not trying to do anything	-0.111 (-1.82)	-0.102 (-1.61)		
Broke school rules	0.0306** (3.00)	0.0349** (3.27)	0.0332*** (3.31)	0.0377*** (3.60)
Age	0.0662*** (4.61)	0.0570*** (3.82)	0.0661*** (4.67)	0.0586*** (3.98)
Black	ref.	ref.	ref.	ref.
Hispanic	-0.122 (-1.75)	-0.109 (-1.51)	-0.103 (-1.49)	-0.0897 (-1.26)

Mixed Race (Non-Hispanic)	0.337 (1.72)	0.313 (1.51)	0.364 (1.87)	0.344 (1.67)
Non-Black / Non-Hispanic	0.0315 (0.57)	0.0235 (0.41)	0.0385 (0.71)	0.0297 (0.53)
Youth mental health scale	-0.0621*** (-7.28)	-0.0580*** (-6.50)	-0.0649*** (-7.79)	-0.0610*** (-7.00)
Constant		-0.753 (-1.76)		-1.315*** (-3.35)
cut1	0.872* (2.11)		1.395*** (3.66)	
cut2	1.924*** (4.64)		2.443*** (6.38)	
<hr/>				
Log-Lik Full Model	4225	4226	4306	4307
LR Stat	256.5	242.3	225.6	215.1
Prob > LR	7.05e-42	4.92e-39	1.27e-39	1.78e-37
AIC	5640.4	4605.9	5758.0	4705.6
BIC	5792.9	4752.0	5866.3	4807.5
<hr/>				

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.1 - Summary Results
 Educational attainment and bullying Residual from 1st stage ordered probit estimation
 Two Stage Residual Inclusion: Average Marginal Effects

	(1) none	(2) GED	(3) HS Diploma	(4) AA	(5) B.A./B.S.	(6) M.A./M.S.	(7) PhD	(8) Professional
Residual after Ordered Probit	-0.0345*** (0.0101)	-0.0618*** (0.0161)	-0.205*** (0.0478)	-0.00247 (0.00239)	0.134*** (0.0319)	0.122*** (0.0297)	0.0119* (0.00516)	0.0360*** (0.0108)
Bullied: One period	0.000171 (0.00295)	0.000305 (0.00527)	0.00101 (0.0174)	0.0000115 (0.000192)	-0.000664 (0.0115)	-0.000599 (0.0103)	-0.0000586 (0.00101)	-0.000177 (0.00304)
Bullied: Two periods	-0.000807 (0.00578)	-0.00146 (0.0105)	-0.00491 (0.0359)	-0.0000746 (0.000647)	0.00317 (0.0228)	0.00292 (0.0214)	0.000289 (0.00213)	0.000877 (0.00651)
Observations	1044	1044	1044	1044	1044	1044	1044	1044
Pseudo R^2	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Chi-squared	572.9	572.9	572.9	572.9	572.9	572.9	572.9	572.9
p-value	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105

Residual calculated using 1st stage ordered probit estimation of the bullied equation.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.2 - Summary Results
 Educational attainment and level of bullying Residual from 1st stage probit estimation
 Two Stage Residual Inclusion: Average Marginal Effects

	(1) none	(2) GED	(3) HS Diploma	(4) AA	(5) B.A./B.S.	(6) M.A./M.S.	(7) PhD	(8) Professional
Residual after probit	-0.0443** (0.0147)	-0.0793*** (0.0240)	-0.263*** (0.0738)	-0.00355 (0.00320)	0.172*** (0.0487)	0.157*** (0.0457)	0.0153* (0.00702)	0.0465** (0.0157)
Bullied	0.0763** (0.0252)	0.137*** (0.0412)	0.454*** (0.126)	0.00613 (0.00550)	-0.297*** (0.0834)	-0.270*** (0.0781)	-0.0263* (0.0121)	-0.0801** (0.0269)
Observations	1044	1044	1044	1044	1044	1044	1044	1044
Pseudo R^2	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
Chi-squared	567.3	567.3	567.3	567.3	567.3	567.3	567.3	567.3
p-value	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104

Residual calculated using 1st stage ordered probit estimation of the bullied equation.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.1 - Summary Results
 Employment Status and Bullying Average Marginal Effects

	(1) Employed	(2) Unemployed	(3) Out of the Labor Force	(4) Self-employed
Never Bullied	ref.	ref.	ref.	ref.
Bullied: One period	-0.00446 (0.0243)	0.00912 (0.00946)	-0.0231 (0.0171)	0.0185 (0.0214)
Bullied: Two periods	-0.0358 (0.0535)	0.00609 (0.0195)	-0.0118 (0.0360)	0.0415 (0.0462)
Observations	2359	2359	2359	2359
Pseudo R^2	0.129	0.129	0.129	0.129
Chi-squared	16119.4	16119.4	16119.4	16119.4
p-value	0	0	0	0

Marginal effects; Standard errors in parentheses
 (d) for discrete change of dummy variable from 0 to 1
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.1 - Summary Results
Effect on total income in 2013

	(1) No sample selection	(2) Sample selection
Never bullied	ref.	ref.
Bullied: One period	7.308 (957.7)	-186.2 (1644.7)
Bullied: Two periods	-5240.8*** (1528.4)	-7395.2** (2783.8)
Inverse Mills Ratio 2		-189.2* (84.99)
Inverse Mills Ratio 3		-1510.4*** (328.4)
Inverse Mills Ratio 4		802.9 (464.6)
Constant	-44547.2*** (8275.2)	-38505.1* (15456.1)
Observations	4744	1559
Adjusted R^2	0.363	0.420
RMSE	24219.3	24713.3

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.2 - Summary Results
 Effect on total income in 2013
 Comparison of estimation with and without interaction effects

	(1) No Interaction	(2) Interaction
Never bullied	ref.	ref.
Bullied: One period	-186.2 (1644.7)	1288.2 (2591.5)
Bullied: Two periods	-7395.2** (2783.8)	-12489.1*** (3458.0)
Female	-9987.7*** (2047.0)	1009.2 (5204.0)
Inverse Mills Ratio 2	-189.2* (84.99)	-188.3* (85.10)
Inverse Mills Ratio 3	-1510.4*** (328.4)	-1512.1*** (328.2)
Inverse Mills Ratio 4	802.9 (464.6)	794.7 (465.5)
Female # Bullied: One period		-14165.9* (5616.3)
Female # Bullied: Two periods		0 (.)
Constant	-38505.1* (15456.1)	-39656.8* (15467.3)
Observations	1559	1559
Adjusted R^2	0.420	0.421
RMSE	24713.3	24697.0

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix

Table 1

Full Set of Descriptive Statistics

	mean	sd	min	max
Bullied	.2465738	.4310405	0	1
Bullied Level	.2910306	.5433952	0	2
ASVAB score (%)	45.31475	29.17258	0	100
ASVAB score squared(%)	2904.346	2909.998	0	10000
Total schools attended	2.436056	1.058016	0	11
Average Poverty Ratio (1997-2003)	300.5208	256.7568	0	3227
Fights at school	.4012172	1.707858	0	50
Female	.4880899	.499886	0	1
Citizenship Status	.7645815	.4242837	0	1
Fluent in English	.9916478	.0910135	0	1
Homosexual	.0564668	.2308377	0	1
Self-reported weight description	3.190207	.7716105	1	5
Decisions based on weight	2.291917	1.169264	1	4
Broke school rules	3.223891	2.136408	1	7
Age	14.35359	1.488066	12	18
Youth mental health scale	15.32373	2.546862	5	20
Highest Degree Earned	2.310329	1.450416	0	7
Residual after Ordered Probit	1.119941	.2984032	-.7433596	2.101206
Residual after probit	-5.17e-09	.7186874	-1.926866	1.972336
High school GPA	2.818408	.6163567	.1	4.17
Highest grade completed: Resident Dad	12.87835	3.302735	1	20
Highest grade completed: Resident Mom	12.52948	2.954549	1	20
Family Routine Index	9.770429	3.94418	0	28
Reads for Fun	.6093982	.4879306	0	1
age in 2013	31.00084	1.437493	28	34
Resident Mom's Parenting style	2.70566	1.125526	1	4
Resident Dad's Parenting style	2.709831	1.115907	1	4
Employment Status in 2013	2.053812	1.294908	1	4
Limited in kind or amount of work	.08656	.281209	0	1
Marital status	.6816011	.8614669	0	4
Children	1.701267	1.188026	0	8
General health	2.31917	.9879761	1	5
Household size	3.333427	1.680132	1	13
Total Income in 2013	38238.06	30396.29	0	180331
Total weeks tenured in 2013	174.2438	181.1881	0	1231

Tenured squared	63185.37	111237.1	0	1515361
Firm size	6.419635	2.246027	1	8
Hours worked in 2013	1918.44	854.2788	10	8736
Inverse Mills Ratio 2	-16.38835	11.76653	-69.37305	-3.883439
Inverse Mills Ratio 3	-9.00414	6.664726	-65.01262	-.891566
Inverse Mills Ratio 4	-6.060469	2.979026	-55.44271	-2.206554
Computer Skills	.4026046	.4904497	0	1
Race and Ethnicity	2.787845	1.313645	1	4
University/Technical school diploma	.4871995	.4998639	0	1
agriculture forestry and fisheries	.0133205	.1146524	0	1
mining	.0088254	.0935357	0	1
utilities	.007222	.0846815	0	1
construction	.079923	.2711957	0	1
manufacturing	.093389	.2910001	0	1
wholesale trade	.0362586	.186948	0	1
retail trade	.1563753	.3632399	0	1
arts, entertainment, recreation services	0	0	0	0
transportation and warehousing	.0486278	.215106	0	1
information and communication	.0324186	.1771232	0	1
finance, insurance, real estate	.0803786	.2719003	0	1
professional and related services	.1974655	.3981185	0	1
educational, health, and social services	.319705	.4663996	0	1
entertainment, accommodations, and food services	.1591018	.3658004	0	1
other services	.0773427	.2671559	0	1
public administration	.0492461	.2163987	0	1
active duty military	.0046541	.0680678	0	1
executive, administrative and managerial	.1105762	.3136317	0	1
management related	.0630717	.2431115	0	1
mathematical and computer scientists	.0319268	.1758194	0	1
engineers, architects, and surveyors	.0086663	.0926964	0	1
engineering and related technicians	.0059381	.0768358	0	1
physical scientists	.0054566	.0736728	0	1
social scientists and related workers	.0040122	.0632198	0	1
life, physical, and social science technicians	.0046541	.0680678	0	1
counselors, social, and religious workers	.0298507	.1701891	0	1
lawyers judges, and legal support workers	.0110737	.1046556	0	1
teachers	.0688272	.2531804	0	1
education, training, and library workers	.0121971	.1097736	0	1
entertainers and performers, sports and related workers	.0282368	.165662	0	1
media and communication workers	.0187771	.1357478	0	1
health diagnosis and treating practitioners	.0338575	.1808768	0	1
health care technical and support	.0686558	.2528881	0	1
protective service	.0372272	.1893333	0	1
food preparations and serving related	.0951388	.2934301	0	1

cleaning and building service	.0539239	.2258857	0	1
entertainment attendants and related workers	.0083454	.0909783	0	1
funeral related occupations	.000321	.0179144	0	1
personal care and service workers	.066442	.2490731	0	1
sales and related workers	.1440719	.3511908	0	1
office and administrative support workers	.1939676	.3954355	0	1
farming, fishing, and forestry	.0086663	.0926964	0	1
construction trades and extraction workers	.0709356	.2567379	0	1
installation, maintenance, and repair workers	.0463661	.2102936	0	1
production and operating workers	.0155673	.1238041	0	1
food preparation	.0056171	.0747424	0	1
setter, operators, and tenders	.0542362	.2265014	0	1
transportation and material moving workers	.1000962	.3001524	0	1
military specific occupations	.0046541	.0680678	0	1

Observations	8985			
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Table 4.3 - Full Set of Coefficients
 Educational attainment and bullying Residual from 1st stage ordered probit estimation
 Two Stage Residual Inclusion: Average Marginal Effects

	(1) none	(2) GED	(3) HS Diploma	(4) AA	(5) B.A./B.S.	(6) M.A./M.S.	(7) PhD	(8) Professional
Residual after Ordered Probit	-0.0345*** (0.0101)	-0.0618*** (0.0161)	-0.205*** (0.0478)	-0.00247 (0.00239)	0.134*** (0.0319)	0.122*** (0.0297)	0.0119* (0.00516)	0.0360*** (0.0108)
Bullied: One period	0.000171 (0.00295)	0.000305 (0.00527)	0.00101 (0.0174)	0.0000115 (0.000192)	-0.000664 (0.0115)	-0.000599 (0.0103)	-0.0000586 (0.00101)	-0.000177 (0.00304)
Bullied: Two periods	-0.000807 (0.00578)	-0.00146 (0.0105)	-0.00491 (0.0359)	-0.0000746 (0.000647)	0.00317 (0.0228)	0.00292 (0.0214)	0.000289 (0.00213)	0.000877 (0.00651)
High school GPA	-0.0271*** (0.00519)	-0.0486*** (0.00708)	-0.161*** (0.0150)	-0.00194 (0.00184)	0.106*** (0.0106)	0.0955*** (0.0110)	0.00937** (0.00351)	0.0283*** (0.00605)
Highest grade completed: Resident Dad	-0.00169** (0.000567)	-0.00303** (0.000937)	-0.0100*** (0.00290)	-0.000121 (0.000119)	0.00658*** (0.00193)	0.00596*** (0.00176)	0.000585* (0.000270)	0.00176** (0.000609)
Highest grade completed: Resident Mom	-0.00188** (0.000610)	-0.00337*** (0.000999)	-0.0112*** (0.00306)	-0.000135 (0.000130)	0.00732*** (0.00204)	0.00663*** (0.00186)	0.000650* (0.000295)	0.00196** (0.000659)
Family Routine Index	-0.000335 (0.000356)	-0.000600 (0.000638)	-0.00199 (0.00210)	-0.0000239 (0.0000339)	0.00130 (0.00137)	0.00118 (0.00125)	0.000116 (0.000129)	0.000349 (0.000376)
Average Poverty Ratio (1997-2003)	-0.00000659 (0.00000492)	-0.0000118 (0.00000878)	-0.0000392 (0.0000287)	-0.00000472 (0.00000537)	0.0000257 (0.0000189)	0.0000232 (0.0000170)	0.00000228 (0.00000186)	0.00000689 (0.00000523)
ASVAB score (%)	-0.000841*** (0.000252)	-0.00151*** (0.000391)	-0.00500*** (0.00123)	-0.0000601 (0.0000626)	0.00327*** (0.000801)	0.00296*** (0.000769)	0.000291* (0.000127)	0.000878** (0.000271)
ASVAB score squared(%)	0.00000429* (0.00000188)	0.00000768* (0.00000314)	0.0000255* (0.0000104)	0.000000307 (0.000000346)	-0.0000167* (0.00000676)	-0.0000151* (0.00000630)	-0.00000148 (0.000000808)	-0.00000448* (0.00000200)
Female	0.00172 (0.00301)	0.00308 (0.00538)	0.0102 (0.0178)	0.000123 (0.000245)	-0.00669 (0.0117)	-0.00605 (0.0106)	-0.000594 (0.00106)	-0.00179 (0.00314)
Hispanic	0.00680 (0.00401)	0.0126 (0.00717)	0.0446 (0.0246)	0.00150 (0.00110)	-0.0258 (0.0146)	-0.0275 (0.0153)	-0.00290 (0.00191)	-0.00934 (0.00543)
Mixed Race (Non- Hispanic)	-0.000139 (0.00944)	-0.000278 (0.0190)	-0.00113 (0.0771)	-0.0000668 (0.00461)	0.000547 (0.0372)	0.000708 (0.0485)	0.0000804 (0.00551)	0.000275 (0.0189)
Non-Black / Non- Hispanic	0.00743* (0.00311)	0.0137* (0.00550)	0.0480* (0.0195)	0.00151 (0.00111)	-0.0281** (0.0103)	-0.0295* (0.0125)	-0.00310 (0.00178)	-0.00994* (0.00499)
Youth mental health scale	0.00275** (0.000847)	0.00493*** (0.00136)	0.0163*** (0.00407)	0.000197 (0.000192)	-0.0107*** (0.00271)	-0.00969*** (0.00252)	-0.000951* (0.000420)	-0.00287** (0.000902)

Reads for Fun	0.00255 (0.00248)	0.00457 (0.00439)	0.0152 (0.0145)	0.000182 (0.000251)	-0.00992 (0.00949)	-0.00898 (0.00862)	-0.000881 (0.000900)	-0.00266 (0.00258)
Fights at school	-0.000936 (0.00119)	-0.00168 (0.00213)	-0.00557 (0.00699)	-0.0000670 (0.000103)	0.00365 (0.00459)	0.00330 (0.00416)	0.000324 (0.000424)	0.000978 (0.00124)
Total schools attended	0.00182 (0.00164)	0.00326 (0.00293)	0.0108 (0.00968)	0.000130 (0.000169)	-0.00708 (0.00633)	-0.00640 (0.00574)	-0.000628 (0.000606)	-0.00190 (0.00174)
age in 2013	-0.00302* (0.00144)	-0.00541* (0.00250)	-0.0179* (0.00805)	-0.000216 (0.000225)	0.0118* (0.00528)	0.0106* (0.00484)	0.00104 (0.000602)	0.00315* (0.00153)
Mom Uninvolved	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Permissive	-0.00390 (0.00398)	-0.00702 (0.00709)	-0.0232 (0.0228)	-0.000223 (0.000369)	0.0154 (0.0157)	0.0137 (0.0133)	0.00133 (0.00135)	0.00398 (0.00381)
Authoritarian	-0.00165 (0.00443)	-0.00290 (0.00780)	-0.00922 (0.0247)	-0.0000487 (0.000183)	0.00638 (0.0172)	0.00539 (0.0144)	0.000511 (0.00138)	0.00150 (0.00401)
Authoritative	-0.00198 (0.00428)	-0.00350 (0.00754)	-0.0112 (0.0239)	-0.0000205 (0.000165)	0.00769 (0.0167)	0.00654 (0.0139)	0.000623 (0.00132)	0.00183 (0.00382)
Dad Uninvolved	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Permissive	-0.00534 (0.00408)	-0.00973 (0.00724)	-0.0320 (0.0232)	-0.000171 (0.000515)	0.0217 (0.0163)	0.0186 (0.0133)	0.00177 (0.00139)	0.00518 (0.00367)
Authoritarian	-0.000571 (0.00426)	-0.000991 (0.00740)	-0.00299 (0.0223)	0.0000424 (0.000332)	0.00221 (0.0165)	0.00171 (0.0127)	0.000154 (0.00115)	0.000435 (0.00323)
Authoritative	-0.00515 (0.00421)	-0.00935 (0.00748)	-0.0307 (0.0239)	-0.000137 (0.000463)	0.0209 (0.0169)	0.0178 (0.0137)	0.00169 (0.00140)	0.00493 (0.00372)
Observations	1044	1044	1044	1044	1044	1044	1044	1044
Pseudo R^2	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.182
Chi-squared	572.9	572.9	572.9	572.9	572.9	572.9	572.9	572.9
p-value	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105	5.39e-105

Residual calculated using 1st stage ordered probit estimation of the bullied equation. Higher scores on the youth mental health scale indicate more positive mental health. Higher values on the Family Routine index indicate more time spent in routine activities with family.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.4 - Full Set of Coefficients
 Educational attainment and level of bullying Residual from 1st stage probit estimation
 Two Stage Residual Inclusion: Average Marginal Effects

	(1) none	(2) GED	(3) HS Diploma	(4) AA	(5) B.A./B.S.	(6) M.A./M.S.	(7) PhD	(8) Professional
Residual after probit	-0.0443** (0.0147)	-0.0793*** (0.0240)	-0.263*** (0.0738)	-0.00355 (0.00320)	0.172*** (0.0487)	0.157*** (0.0457)	0.0153* (0.00702)	0.0465** (0.0157)
Bullied	0.0763** (0.0252)	0.137*** (0.0412)	0.454*** (0.126)	0.00613 (0.00550)	-0.297*** (0.0834)	-0.270*** (0.0781)	-0.0263* (0.0121)	-0.0801** (0.0269)
High school GPA	-0.0270*** (0.00519)	-0.0484*** (0.00708)	-0.161*** (0.0150)	-0.00217 (0.00185)	0.105*** (0.0106)	0.0957*** (0.0110)	0.00932** (0.00350)	0.0284*** (0.00607)
Highest grade completed: Resident Dad	-0.00168** (0.000566)	-0.00300** (0.000937)	-0.00997*** (0.00291)	-0.000135 (0.000120)	0.00652*** (0.00193)	0.00593*** (0.00177)	0.000578* (0.000269)	0.00176** (0.000612)
Highest grade completed: Resident Mom	-0.00184** (0.000606)	-0.00329*** (0.000996)	-0.0109*** (0.00306)	-0.000147 (0.000129)	0.00714*** (0.00203)	0.00649*** (0.00186)	0.000633* (0.000290)	0.00193** (0.000657)
Family Routine Index	-0.000377 (0.000357)	-0.000676 (0.000639)	-0.00224 (0.00210)	-0.0000303 (0.0000382)	0.00147 (0.00137)	0.00133 (0.00125)	0.000130 (0.000131)	0.000396 (0.000379)
Average Poverty Ratio (1997- 2003)	-0.00000869 (0.00000494)	-0.0000156 (0.00000874)	-0.0000517 (0.0000283)	-0.00000698 (0.00000665)	0.0000338 (0.0000186)	0.0000307 (0.0000168)	0.00000300 (0.00000196)	0.00000912 (0.00000532)
ASVAB score (%)	-0.000757** (0.000242)	-0.00136*** (0.000382)	-0.00451*** (0.00121)	-0.0000608 (0.0000585)	0.00295*** (0.000789)	0.00268*** (0.000760)	0.000261* (0.000118)	0.000795** (0.000261)
ASVAB score squared(%)	0.00000374* (0.00000184)	0.00000670* (0.00000311)	0.0000222* (0.0000103)	0.000000300 (0.000000324)	-0.0000145* (0.00000671)	-0.0000132* (0.00000628)	-0.00000129 (0.000000759)	-0.00000392* (0.00000196)
Female	-0.000654 (0.00283)	-0.00117 (0.00507)	-0.00389 (0.0168)	-0.0000525 (0.000230)	0.00255 (0.0110)	0.00231 (0.0100)	0.000226 (0.000978)	0.000686 (0.00297)
Hispanic	0.00496 (0.00372)	0.00925 (0.00680)	0.0337 (0.0243)	0.00139 (0.00114)	-0.0187 (0.0137)	-0.0209 (0.0152)	-0.00224 (0.00181)	-0.00741 (0.00552)
Mixed Race (Non-Hispanic)	0.00199 (0.0108)	0.00383 (0.0203)	0.0147 (0.0754)	0.000765 (0.00339)	-0.00758 (0.0408)	-0.00924 (0.0471)	-0.00102 (0.00510)	-0.00346 (0.0169)
Non-Black / Non-Hispanic	0.00786* (0.00318)	0.0142* (0.00553)	0.0494* (0.0194)	0.00157 (0.00113)	-0.0290** (0.0102)	-0.0305* (0.0126)	-0.00319 (0.00180)	-0.0103* (0.00506)
Youth mental health scale	0.00210** (0.000737)	0.00376** (0.00121)	0.0125*** (0.00373)	0.000169 (0.000152)	-0.00817*** (0.00247)	-0.00743** (0.00230)	-0.000725* (0.000342)	-0.00220** (0.000783)
Reads for Fun	0.00261 (0.00249)	0.00468 (0.00440)	0.0155 (0.0145)	0.000210 (0.000271)	-0.0102 (0.00950)	-0.00923 (0.00866)	-0.000900 (0.000901)	-0.00274 (0.00260)
Fights at school	-0.00123 (0.00128)	-0.00220 (0.00228)	-0.00731 (0.00747)	-0.0000986 (0.000130)	0.00478 (0.00489)	0.00434 (0.00446)	0.000424 (0.000460)	0.00129 (0.00134)

Total schools attended	0.00295 (0.00162)	0.00528 (0.00284)	0.0175 (0.00929)	0.000237 (0.000234)	-0.0115 (0.00607)	-0.0104 (0.00553)	-0.00102 (0.000651)	-0.00309 (0.00175)
age in 2013	-0.00210 (0.00135)	-0.00377 (0.00239)	-0.0125 (0.00780)	-0.000169 (0.000178)	0.00819 (0.00510)	0.00745 (0.00467)	0.000726 (0.000523)	0.00221 (0.00143)
Mom Uninvolved	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Permissive	-0.00396 (0.00400)	-0.00712 (0.00712)	-0.0236 (0.0229)	-0.000244 (0.000378)	0.0156 (0.0157)	0.0139 (0.0134)	0.00134 (0.00135)	0.00402 (0.00381)
Authoritarian	-0.00162 (0.00446)	-0.00284 (0.00782)	-0.00901 (0.0248)	-0.0000812 (0.000181)	0.00626 (0.0173)	0.00527 (0.0144)	0.000495 (0.00137)	0.00146 (0.00401)
Authoritative	-0.00223 (0.00428)	-0.00395 (0.00756)	-0.0127 (0.0239)	-0.0000420 (0.000185)	0.00869 (0.0167)	0.00741 (0.0139)	0.000701 (0.00132)	0.00208 (0.00383)
Dad Uninvolved	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Permissive	-0.00498 (0.00405)	-0.00906 (0.00722)	-0.0299 (0.0233)	-0.000211 (0.000481)	0.0202 (0.0163)	0.0174 (0.0134)	0.00165 (0.00137)	0.00487 (0.00370)
Authoritarian	-0.000322 (0.00424)	-0.000560 (0.00738)	-0.00170 (0.0224)	0.0000202 (0.000274)	0.00125 (0.0165)	0.000973 (0.0128)	0.0000877 (0.00115)	0.000249 (0.00328)
Authoritative	-0.00490 (0.00418)	-0.00891 (0.00745)	-0.0294 (0.0240)	-0.000197 (0.000440)	0.0199 (0.0168)	0.0171 (0.0138)	0.00162 (0.00139)	0.00477 (0.00376)
Observations	1044	1044	1044	1044	1044	1044	1044	1044
Pseudo R^2	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180
Chi-squared	567.3	567.3	567.3	567.3	567.3	567.3	567.3	567.3
p-value	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104	1.63e-104

Residual calculated using 1st stage probit estimation of the bullied equation. Higher scores on the youth mental health scale indicate more positive mental health. Higher values on the Family Routine index indicate more time spent in routine activities with family.

(d) for discrete change of dummy variable from 0 to 1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.2 - Full Set of Coefficients
Employment Status and Bullying
Average Marginal Effects

	(1) Employed	(2) Unemployed	(3) Out of the Labor Force	(4) Self-employed
Never Bullied	ref.	ref.	ref.	ref.
Bullied: One period	-0.00446 (0.0243)	0.00912 (0.00946)	-0.0231 (0.0171)	0.0185 (0.0214)
Bullied: Two periods	-0.0358 (0.0535)	0.00609 (0.0195)	-0.0118 (0.0360)	0.0415 (0.0462)
Female	-0.0405* (0.0205)	-0.00470 (0.00825)	0.101*** (0.0155)	-0.0553** (0.0177)
Limited in kind or amount of work	-0.282*** (0.0446)	-0.00389 (0.0141)	0.137*** (0.0241)	0.149*** (0.0374)
married	0.000583 (0.0239)	-0.0102 (0.00939)	0.0222 (0.0170)	-0.0126 (0.0211)
never married	ref.	ref.	ref.	ref.
separated	0.249*** (0.0510)	-0.0219 (0.0151)	-0.107*** (0.0304)	-0.120** (0.0453)
divorced	0.0274 (0.0352)	-0.00285 (0.0122)	0.00167 (0.0247)	-0.0262 (0.0312)
widowed	-0.212 (0.183)	0.145 (0.107)	-0.102 (0.0758)	0.169 (0.164)
Children	0.00684 (0.0118)	-0.00201 (0.00473)	-0.00147 (0.00877)	-0.00336 (0.0101)
excellent	ref.	ref.	ref.	ref.
very good	0.0203 (0.0261)	-0.0128 (0.00981)	-0.00906 (0.0200)	0.00156 (0.0239)
good	0.0656* (0.0266)	-0.00736 (0.0103)	-0.0126 (0.0199)	-0.0456 (0.0239)
fair	0.0752* (0.0374)	0.00904 (0.0150)	-0.0129 (0.0259)	-0.0713* (0.0324)
poor	-0.0717 (0.109)	0.0513 (0.0587)	0.0652 (0.0617)	-0.0448 (0.0790)
Household size	-0.0141 (0.00855)	-0.000641 (0.00305)	-0.00645 (0.00634)	0.0212** (0.00721)
GED	0.0620 (0.0382)	0.00716 (0.0131)	-0.0480 (0.0290)	-0.0212 (0.0324)
None	ref.	ref.	ref.	ref.
High School diploma (12 year program)	0.0858* (0.0339)	0.00308 (0.0115)	-0.106*** (0.0264)	0.0173 (0.0293)
Associate/Junior college (AA)	0.143** (0.0464)	-0.00377 (0.0171)	-0.117*** (0.0352)	-0.0228 (0.0397)
Bachelor's degree (BA, BS)	0.151*** (0.0416)	-0.0249* (0.0119)	-0.124*** (0.0321)	-0.00182 (0.0361)
Master's degree (MA, MS)	0.213*** (0.0528)	-0.0329*** (0.00991)	-0.149*** (0.0425)	-0.0312 (0.0451)

PhD	0.522*** (0.0309)	-0.0329*** (0.00991)	-0.270*** (0.0246)	-0.219*** (0.0263)
Professional degree (DDS, JD, MD)	0.333*** (0.0991)	-0.0329*** (0.00991)	-0.270*** (0.0246)	-0.0300 (0.0977)
Black	ref.	ref.	ref.	ref.
Hispanic	0.0170 (0.0263)	-0.0101 (0.00888)	-0.0226 (0.0188)	0.0157 (0.0233)
Mixed Race (Non-Hispanic)	-0.0816 (0.0971)	0.0953 (0.0664)	-0.0458 (0.0632)	0.0321 (0.0852)
Non-Black / Non-Hispanic	-0.0411 (0.0237)	0.00110 (0.00946)	-0.00243 (0.0177)	0.0425* (0.0208)
Total weeks tenured in 2013	0.000877*** (0.0000807)	-0.000109** (0.0000393)	-0.000975*** (0.000111)	0.000207*** (0.0000511)
Observations	2359	2359	2359	2359
Pseudo R^2	0.129	0.129	0.129	0.129
Chi-squared	16119.4	16119.4	16119.4	16119.4
p-value	0	0	0	0

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.3 - Full Set of Coefficients
 Effect on total income in 2013
 Comparison of Models with/without Sample Selection

	(1) No sample selection	(2) Sample selection
Never bullied	ref.	ref.
Bullied: One period	7.308 (957.7)	-186.2 (1644.7)
Bullied: Two periods	-5240.8*** (1528.4)	-7395.2** (2783.8)
Female	-7739.1*** (869.3)	-9987.7*** (2047.0)
Total weeks tenured in 2013	41.80*** (5.855)	12.07 (12.73)
Tenured squared	-0.0395*** (0.00825)	-0.0534*** (0.0131)
never married	ref.	ref.
married	4866.9*** (794.9)	3610.2* (1605.0)
separated	-3197.9 (2468.3)	-4809.2 (3502.0)
divorced	423.2 (1277.6)	1894.9 (2419.9)
widowed	-950.4 (3419.4)	-10044.1* (3933.2)
1-4	ref.	ref.
5-9	1549.0 (1603.5)	4455.1 (3015.2)
10-19	3576.3* (1619.3)	5422.5 (3024.2)
20-49	3674.2* (1560.6)	6091.4 (3225.0)
50-99	7467.7*** (1751.5)	11718.3*** (3541.8)
100-249	9304.8*** (1745.2)	10996.6*** (3301.0)
250-499	9317.5*** (2016.5)	12444.0** (3983.6)
>500	8652.3*** (1435.7)	12117.2*** (2851.5)
Hours worked in 2013	9.017*** (0.610)	8.375*** (1.049)
age in 2013	1564.7*** (262.1)	1144.5* (467.6)
Computer Skills	5873.5*** (768.3)	5579.7*** (1408.0)
Black	ref.	ref.

Hispanic	2022.4* (922.8)	3356.0 (1796.6)
Mixed Race (Non-Hispanic)	7123.0 (4334.1)	1293.0 (6518.4)
Non-Black / Non-Hispanic	4417.1*** (897.9)	5095.8** (1824.0)
University/Technical school diploma	9855.2*** (918.0)	9909.3*** (2090.7)
agriculture forestry and fisheries	-4700.0 (4374.2)	-11153.2 (6761.2)
mining	18425.8*** (5363.0)	30328.5** (10892.7)
utilities	11144.1** (4322.0)	6830.2 (6115.0)
construction	4588.2 (2463.2)	2985.7 (4873.8)
manufacturing	640.3 (1389.8)	1016.7 (2423.8)
wholesale trade	1529.5 (2201.1)	-1166.0 (3426.0)
retail trade	-4687.3*** (1327.9)	-5807.8* (2309.9)
arts, entertainment, recreation services	0 (.)	0 (.)
transportation and warehousing	1985.5 (1791.5)	-3907.0 (2756.4)
information and communication	2605.9 (2191.8)	-1466.3 (4266.6)
finance, insurance, real estate	3818.6* (1706.6)	5077.9 (2975.5)
professional and related services	2914.9** (1129.9)	4752.6* (2324.0)
educational, health, and social services	-6122.5*** (1038.1)	-7412.6*** (1751.8)
entertainment, accommodations, and food services	-5010.9*** (1320.2)	-6768.9** (2198.0)
other services	-3119.1* (1289.8)	-3136.7 (2260.5)
public administration	3254.4 (1702.1)	-3566.5 (2852.8)
active duty military	10635.6 (17918.0)	-12652.3 (20182.4)
executive, administrative and managerial	5663.0*** (1445.2)	4764.8 (2462.9)
management related	5408.3** (1907.7)	3577.5 (3623.6)
mathematical and computer scientists	6495.6* (2726.8)	1342.2 (4525.7)

engineers, architects, and surveyors	8753.9* (4310.3)	5194.3 (9008.2)
engineering and related technicians	-7945.8* (3146.7)	-8117.0 (5265.8)
physical scientists	-2836.9 (3968.8)	-12356.1* (5473.8)
social scientists and related workers	-1588.9 (4686.1)	-25221.9 (16184.6)
life, physical, and social science technicians	-4231.3 (6806.3)	-7888.1 (5180.0)
counselors, social, and religious workers	-3254.6* (1390.1)	-2428.3 (2674.6)
lawyers judges, and legal support workers	16034.9* (6318.4)	-9762.5 (14920.2)
teachers	-3589.7** (1388.1)	-5744.8* (2616.4)
education, training, and library workers	-6199.1** (2028.5)	2711.6 (4288.2)
entertainers and performers, sports and related workers	-1410.6 (2083.7)	-1446.0 (3318.1)
media and communication workers	-2433.4 (2994.2)	-2525.7 (4984.8)
health diagnosis and treating practitioners	14476.7*** (2734.9)	12852.2** (4698.2)
health care technical and support	-842.3 (1203.4)	4595.5* (2278.9)
protective service	-1125.9 (1977.5)	265.8 (3147.8)
food preparations and serving related	-5058.8*** (1487.0)	1721.6 (3008.8)
cleaning and building service	-4617.1** (1535.4)	-1510.8 (2669.7)
entertainment attendants and related workers	-4594.7 (2694.4)	2331.7 (5877.4)
funeral related occupations	-10594.3 (6734.2)	0 (.)
personal care and service workers	-3009.9* (1440.6)	-1644.5 (2496.9)
sales and related workers	1326.0 (1519.6)	5912.1* (2735.1)
office and administrative support workers	-6417.8*** (1015.9)	-3208.1 (1782.8)
farming, fishing, and forestry	-3285.1 (4972.8)	1246.3 (8089.8)
construction trades and extraction workers	-5063.4* (2452.1)	-6285.3 (4654.9)
installation, maintenance, and repair workers	159.7 (1892.8)	1629.7 (3278.7)

production and operating workers	-6832.1** (2382.5)	-8838.1 (4913.0)
food preparation	-10118.2*** (2511.1)	-10877.0 (5691.9)
setter, operators, and tenders	-6137.5*** (1640.8)	-4891.8 (2867.5)
transportation and material moving workers	-8744.4*** (1386.5)	-8436.4*** (2241.3)
military specific occupations	0 (.)	0 (.)
Inverse Mills Ratio 2		-189.2* (84.99)
Inverse Mills Ratio 3		-1510.4*** (328.4)
Inverse Mills Ratio 4		802.9 (464.6)
Constant	-44547.2*** (8275.2)	-38505.1* (15456.1)
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Observations	4744	1559
Adjusted R^2	0.363	0.420
RMSE	24219.3	24713.3
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Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.4 - Full Set of Coefficients
 Effect on total income in 2013
 Comparison of estimation with and without interaction effects

	(1) No Interaction	(2) Interaction
Never bullied	ref.	ref.
Bullied: One period	-186.2 (1644.7)	1288.2 (2591.5)
Bullied: Two periods	-7395.2** (2783.8)	-12489.1*** (3458.0)
Female	-9987.7*** (2047.0)	1009.2 (5204.0)
Total weeks tenured in 2013	12.07 (12.73)	11.81 (12.71)
Tenured squared	-0.0534*** (0.0131)	-0.0533*** (0.0131)
never married	ref.	ref.
married	3610.2* (1605.0)	3706.7* (1602.8)
separated	-4809.2 (3502.0)	-4984.6 (3502.4)
divorced	1894.9 (2419.9)	1860.4 (2418.7)
widowed	-10044.1* (3933.2)	-10063.7* (3984.8)
1-4	ref.	ref.
5-9	4455.1 (3015.2)	4395.4 (3020.6)
10-19	5422.5 (3024.2)	5403.5 (3039.1)
20-49	6091.4 (3225.0)	5966.1 (3223.2)
50-99	11718.3*** (3541.8)	11398.7** (3555.0)
100-249	10996.6*** (3301.0)	10997.4*** (3296.4)
250-499	12444.0** (3983.6)	12039.3** (3994.4)
>500	12117.2*** (2851.5)	11876.9*** (2850.9)
Hours worked in 2013	8.375*** (1.049)	8.326*** (1.054)
Inverse Mills Ratio 2	-189.2* (84.99)	-188.3* (85.10)
Inverse Mills Ratio 3	-1510.4*** (328.4)	-1512.1*** (328.2)

Inverse Mills Ratio 4	802.9 (464.6)	794.7 (465.5)
age in 2013	1144.5* (467.6)	1190.1* (467.7)
Computer Skills	5579.7*** (1408.0)	5510.0*** (1405.9)
Black	ref.	ref.
Hispanic	3356.0 (1796.6)	3178.2 (1795.2)
Mixed Race (Non-Hispanic)	1293.0 (6518.4)	2030.3 (6522.2)
Non-Black / Non-Hispanic	5095.8** (1824.0)	4973.0** (1818.9)
University/Technical school diploma	9909.3*** (2090.7)	9970.6*** (2089.7)
agriculture forestry and fisheries	-11153.2 (6761.2)	-11152.9 (6706.4)
mining	30328.5** (10892.7)	30665.5** (10885.8)
utilities	6830.2 (6115.0)	6834.4 (6074.9)
construction	2985.7 (4873.8)	2855.0 (4889.2)
manufacturing	1016.7 (2423.8)	1151.7 (2426.6)
wholesale trade	-1166.0 (3426.0)	-1081.4 (3432.6)
retail trade	-5807.8* (2309.9)	-5668.4* (2315.0)
arts, entertainment, recreation services	0 (.)	0 (.)
transportation and warehousing	-3907.0 (2756.4)	-4034.5 (2739.5)
information and communication	-1466.3 (4266.6)	-1140.1 (4231.8)
finance, insurance, real estate	5077.9 (2975.5)	5026.3 (2969.5)
professional and related services	4752.6* (2324.0)	4791.4* (2320.4)
educational, health, and social services	-7412.6*** (1751.8)	-7306.4*** (1742.6)
entertainment, accommodations, and food services	-6768.9** (2198.0)	-6707.2** (2186.7)
other services	-3136.7 (2260.5)	-2881.6 (2273.5)
public administration	-3566.5 (2852.8)	-3747.2 (2837.1)
active duty military	-12652.3 (20182.4)	-12755.6 (20163.5)

executive, administrative and managerial	4764.8 (2462.9)	4627.1 (2479.2)
management related	3577.5 (3623.6)	3610.0 (3611.8)
mathematical and computer scientists	1342.2 (4525.7)	1321.1 (4603.7)
engineers, architects, and surveyors	5194.3 (9008.2)	4359.8 (8977.5)
engineering and related technicians	-8117.0 (5265.8)	-8675.6 (5226.5)
physical scientists	-12356.1* (5473.8)	-12339.8* (5480.1)
social scientists and related workers	-25221.9 (16184.6)	-25345.9 (16324.9)
life, physical, and social science technicians	-7888.1 (5180.0)	-8465.0 (5397.3)
counselors, social, and religious workers	-2428.3 (2674.6)	-2563.3 (2680.3)
lawyers judges, and legal support workers	-9762.5 (14920.2)	-9465.8 (14877.4)
teachers	-5744.8* (2616.4)	-5772.4* (2605.8)
education, training, and library workers	2711.6 (4288.2)	2345.0 (4330.5)
entertainers and performers, sports and related workers	-1446.0 (3318.1)	-1562.8 (3272.7)
media and communication workers	-2525.7 (4984.8)	-2410.8 (4954.7)
health diagnosis and treating practitioners	12852.2** (4698.2)	12835.6** (4689.0)
health care technical and support	4595.5* (2278.9)	4309.3 (2271.3)
protective service	265.8 (3147.8)	447.7 (3121.8)
food preparations and serving related	1721.6 (3008.8)	1726.5 (3010.6)
cleaning and building service	-1510.8 (2669.7)	-1905.5 (2687.4)
entertainment attendants and related workers	2331.7 (5877.4)	2089.6 (6001.0)
funeral related occupations	0 (.)	0 (.)
personal care and service workers	-1644.5 (2496.9)	-2025.7 (2516.1)
sales and related workers	5912.1* (2735.1)	5883.1* (2737.6)
office and administrative support workers	-3208.1 (1782.8)	-3476.9 (1784.8)

farming, fishing, and forestry	1246.3 (8089.8)	1087.7 (8117.1)
construction trades and extraction workers	-6285.3 (4654.9)	-6303.7 (4667.5)
installation, maintenance, and repair workers	1629.7 (3278.7)	1444.5 (3279.9)
production and operating workers	-8838.1 (4913.0)	-9241.1 (4911.6)
food preparation	-10877.0 (5691.9)	-11507.9* (5651.7)
setter, operators, and tenders	-4891.8 (2867.5)	-4921.8 (2872.7)
transportation and material moving workers	-8436.4*** (2241.3)	-8304.6*** (2237.8)
military specific occupations	0 (.)	0 (.)
Female # Bullied: One period		-14165.9* (5616.3)
Female # Bullied: Two periods		0 (.)
Constant	-38505.1* (15456.1)	-39656.8* (15467.3)
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Observations	1559	1559
Adjusted R^2	0.420	0.421
RMSE	24713.3	24697.0
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Standard errors in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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