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Headstrong Girls and Dependent Boys: Gender Differences in the Labor Market Returns to Child Behavior

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ABSTRACT

The authors use data from the Children of the National Longitudinal Survey of Youth (C-NLSY79) to examine gender differences in the associations between child behavioral problems and early adult earnings. They find large and significant earnings penalties for women who exhibited more headstrong behavior and for men who exhibited more dependent behavior as children. In contrast, there are no penalties for men who were headstrong or for women who were dependent. While other child behavioral problems are also associated with labor market earnings, their associations are not significantly different by gender. The gender differences in headstrong and dependent behavior are not explained by education, marriage, depression, self-esteem, health, or adult personality traits. However, one potential explanation is that these gender differences are a consequence of deviations from gender norms and stereotypes in the workplace.

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A substantial literature has documented the significant relationship between cognitive skills, measured in childhood and adolescence, and adult earnings (e.g., Murnane, Willet and Levy, 1995). More recently, studies have also reported significant associations between adult earnings and childhood "non-cognitive skills", such as socio-emotional behaviors and temperament (e.g., Heckman, Stixrud and Urzua, 2006, and Lindqvist and Vestman, 2011). However, there has been relatively little research on *gender differences* in the labor market returns to childhood "non-cognitive skills", especially when disaggregated into specific domains of behavior. If men and women are paid differently for the same early-life skills or behaviors, this may contribute to gender gaps in earnings and suggest the presence of labor market discrimination (Blau and Kahn, 2017). Gender differences in the labor market returns to childhood behaviors can also provide insights about the role of gender norms and stereotypes in the labor market.

We use data from the Children of the National Longitudinal Survey of Youth 1979 (C-NLSY79) survey to examine associations between several distinct child behavioral problems (ages 4 to 12) and early adult earnings (ages 24 to 30). Our measures of child behavioral problems are drawn from an abbreviated version of the Child Behavior Checklist (CBCL) that is reported by parents. They were "…designed to measure some of the more common syndromes of problem behavior found in children" (Zill, 1985). The CBCL is one of the most widely used assessments of children's emotional and behavioral problems, and shown to have strong predictive validity and to be measurement invariant with respect to child gender. Like the CBCL on which they are based, the measures of behavioral problems in the C-NLSY79 have also been shown to have strong predictive validity (Parcel and Menaghan, 1988). The use of these

disaggregated categories of child behavior is novel and empirically important because broader constructs can obscure the heterogeneous relationships of individual behaviors with earnings.

While our study is unique in examining gender differences in the relationship between child behavior and labor market outcomes, there is a large literature that examines the relationship between *adult* personality and labor market outcomes, as well as the gender differences in these relationships.[1] However, it is important to distinguish between the labor market returns to behaviors observed in childhood vs. self-reported personality traits measured in adulthood. First, these are conceptually different psychological constructs, and as we show later, they are not very highly correlated. Second, our measures are not subject to the biases of self-reports. Third, and perhaps most important, is the possibility of reverse causality in analyses that correlate contemporaneous measures of earnings and personality. Our information on child behavior was collected at an early age, long before labor market entry and before schooling is completed. We also present some evidence suggesting that our estimates are not confounded by other background characteristics. However, since we cannot rule this out altogether, we are careful throughout this article to refer to the relationships between child behaviors and adult outcomes as associations

We also explore whether gender differences in the returns to child behavioral problems are mediated by educational attainment, health, marriage, children, as well as adult personality. Through these analyses, we also add to an existing literature that examines the relationship between child behavior problems and educational attainment.[2] Furthermore, our study contributes to the developmental psychology literature focused on the relationship between

[1] See Mueller and Plug, 2006; Heinek and Anger, 2010; Cobb-Clark and Tan, 2011; Heinek, 2011; Judge, Livingston, and Hurst, 2012; Nyhus and Pons, 2012; Fletcher, 2013; Gensowski 2018

[2] See Hinshaw, 1992; Segal, 2008; Diprete and Jennings 2011; Kristoffersen et al. 2015; Owens, 2016; Papageorge, Ronda, and Zheng, 2019

childhood behavior and adult personality (Caspi et al. 2005; Donnellan et al. 2015) by estimating these associations for a large, recent cohort of US children that, to our knowledge, has not been previously examined. Finally, our research is also related to the effects of attention-deficit/hyperactive disorder (ADHD) on educational attainment and labor market outcomes (Currie and Stabile, 2006; Fletcher and Wolfe, 2008, 2009; Fletcher, 2014).

The remainder of the article proceeds as follows. The next section describes our measures of child behavior and summarizes the gender differences in behavior for our sample. We then report our estimates of the associations between earnings and these behaviors by gender. Following that, we consider the associations of child behavior with other outcomes and explore potential mechanisms which may explain our results. Finally, we summarize our findings and discuss the limitations of our analyses and avenues for further research.

Background

Measures of child behavioral problems in the C-NLSY79

The measures of child behavioral problems available in the C-NLSY79 are derived from an abbreviated version of the Child Behavior Checklist (CBCL) that is one of the most widely used assessment of children's emotional and behavior problems. The items that comprise these measures "were selected because they were not too rare in the general child population; had a demonstrated ability to discriminate children who had received clinical treatment from those who had not; and tapped some of the more common behavior syndromes in young people" (Zill, 1990). The full set of items in this abbreviated version of the CBCL are commonly referred to as the Behavior Problems Index (BPI). However, in accordance with the CBCL, they were also designed to identify specific behavioral syndromes in children.

The specific behavioral syndromes identified by Zill (1985, 1990) and recorded in the C-NLSY79 are referred to as (a) antisocial behavior, (b) anxiety/depressed mood, (c) headstrong behavior, (d) hyperactive behavior, (e) dependent behavior, and (f) peer conflict. Appendix Table 1 lists the questions that comprise these distinct behavior problem subscales along with their associated syndromes. We also describe the items used to construct the headstrong and dependent subscales below because, as we show later, they are the ones associated with significant gender differences in earnings. Children score high on the headstrong subscale when their caregiver reports that he or she (i) argues too much, (ii) has strong temper and loses it easily (iii) is disobedient at home, (iv) is stubborn, sullen, or irritable, and (v) is rather high strung, tense, and nervous. Children score high on the dependent subscale when their mother reports that he or she (i) demands a lot of attention, (ii) clings to adults, (iii) cries too much, and (iv) is too dependent on others.

The behavioral problem measures in the C-NLSY79 are based on maternal reports of children between the ages of 4 and 12. The response categories for these questions are "often true," "sometimes true," and "not true". The scores for the behavioral syndromes are produced by summing across the dichotomized responses to the relevant subset of items (whereby each item answered "often" or "sometimes true" is given a value of one). We average the scores across all surveys for which the child is present between ages 4 and 12 in order to improve reliability.[3] However, our findings are unchanged if we use measures of behavioral problems assessed at early ages (4-6) or later ages (8-12), which is consistent with the fairly stable pattern

[3] Approximately 86% of the sample of children were present for 4 or 5 survey waves, which represent the maximum number of possible surveys to be present given that surveys were fielded every two years. We assessed whether controlling for the number of surveys present affected estimates and there was virtually no change in our results.

of gender differences in these child behaviors between ages 4 and 12 (see Appendix Figure 1, where blue lines represent boys and orange lines represent girls).

The validity of behavioral problem measures

The behavioral problem measures in the C-NLSY79 have been extensively analyzed and validated across different populations. Zill (1985) uses principal components analysis to verify that the clusters of items designed to identify these behavior syndromes represented separable dimensions with common underlying factors using the 1981 Child Health Supplement to the National Health Interview Survey (NHIS). Parcel and Menaghan (1988) correlate the behavioral problem measures with a variety of social and demographic variables in the C-NLSY79 to provide evidence of construct validity. The CBCL, which is the primary source for the behavioral measures used in the study, has been subject to even more extensive validation to confirm that it identifies specific behavioral syndromes and discriminates between children referred and non-referred to treatment across different populations (e.g. Edlebrock and Costello 1988; Jensen et al. 1993; Chen et al. 1994; Drotar et al. 1995; Kasius et al. 1997; Greenbaum et al. 2004; Seligmman et al. 2004; Ivanova et al. 2007; Ferdinand 2008; Nakumra et al. 2009; Ebustani et al. 2010; and Ivanova et al. 2019).

One issue that merits discussion is the possibility of gender bias in mothers' assessments of child behavioral problems. Using the full set of items in the CBCL, Konold et al. (2004) show that the general form and factor loadings of child behavior problems are measurement invariant (i.e., unbiased) with respect to the child's gender and across mother's and father's assessments. The measurement invariance by child gender is further confirmed by van der Sluis (2017) for a large clinical sample.

Despite the evidence that the CBCL is measurement invariant with respect to gender, we also assessed whether it is a potential issue for our sample. Accordingly, we re-estimated the models for our primary outcome of earnings using gender-specific, standardized measures of behaviors, as suggested by van der Slius (2017) and others. Results from this analysis were virtually identical to those reported below that uses the common measures. We also examined whether one particular question in the dependent subscale—does the child cry too much—had a particularly strong influence on results related to the dependent subscale.[4] It did not. Finally, we also address this issue by showing that our results are robust to controlling for an extensive set of mothers' characteristics. Overall, there is substantial evidence that the behavioral subscales are measuring the same constructs for males and females, and that the results reported below are not an artifact of measurement problems.

Gender differences in behavior, skills, and other covariates

Differences in child behavior and skills by gender are well known and have been described in prior work (McLeod and Kaiser, 2004; Else-Quest, et al. 2006; Halpern et al. 2007; Duncan and Magnuson, 2011; Owens 2016; Autor et al. 2019). However, we briefly describe the gender differences for our sample of children who were born between 1981 and 1990 and observed as adults between the ages of 24 to 30 (i.e., between 2006 and 2014).[5] As shown in Table 1, boys have significantly higher rates of hyperactive, anti-social, headstrong and peer

[4] This question about crying too much has been mentioned as one that may not be measurement invariant by child gender (van der Slius, 2017). Indeed, Yarnell et al. (2013) reported that the question cries too much was not measurement invariant in a sample of children from Mauritius. To assess whether this specific component is a problem in our sample, we reconstructed the dependent subscale omitting this question and re-estimated the models reported below. Our results were essentially unchanged.

[5] The sample consists of 3,477 unique children whom we observe 7283 times as adults: 1,052 are observed once; 1,163 are observed 2 times; 1,143 are observed 3 times; and 119 are observed 4 times.

conflict behavior while girls have significantly higher rates of dependent behavior. The gender differences in behavior are quite similar over childhood years, as seen Appendix Figure 1.

The C-NLSY79 measured math and reading skills between the ages of 5 and 13 using the Peabody Individual Achievement Test (PIAT) in Mathematics, Reading Recognition, and Reading Comprehension. Table 1 indicates that math scores are almost identical for boys and girls while reading scores are about 0.1 standard deviations higher for girls than boys.

Finally, the C-NLSY79 also provides extensive information about the child's family background characteristics, including mother's education, her Armed Forces Qualification Test (AFQT) score, marital status at birth, self-esteem, internal-external locus of control and indicators for whether the household had magazines, newspapers and a library card. As shown in Table 1, most of these background characteristics are not substantially different by gender, although there are small differences in mother's marital status and age at birth, and whether the household had a library card. Additional evidence related to selection on family background factors is provided in Appendix Table 2. This table presents regression estimates of the gender differences in the relationship between several maternal characteristics and our six child behaviors of interest. Of the 36 estimates shown, only three differ significantly by gender.

Labor market returns to child behavior

Earnings are our primary outcome and defined as self-reported annual earnings in the previous year.[6] The goal of our study is to estimate the associations between several distinct child behavioral problems and adult earnings, and to assess whether there are gender differences

[6] The sample consists of those with valid earnings including zeros. Earnings information is missing (i.e., with an invalid response) for approximately 11% of the sample. None of the child behaviors are significantly related to the probability of being in the sample.

in those associations. We estimate a series of OLS regression models to obtain these estimates. As described in the previous section, we focus on continuous measures of child behavior based on dichotomized responses to the underlying items, as constructed in the C-NLSY79. However, we standardize these measures to have mean 0 and a standard deviation of 1 to facilitate comparisons of the magnitudes of the coefficients.

All of our regression models include controls for child race/ethnicity (non-Hispanic white, non-Hispanic Black, Hispanic), birth order, each year of age at time of interview, and each birth year. Thus, we compare children assessed at similar ages and from similar birth cohorts. We also include math and reading achievement test scores and controls for mother characteristics to address potential confounding factors and differences in reporting, allowing for differential effects of all variables by gender.[7] The standard errors of the regression estimates allow for non-independence between multiple observations per person.

Table 2 presents results from these regressions. The first two columns show estimates for the full sample of men and women respectively. We observe large and significant earnings penalties for men who exhibited more dependent behavior in childhood. A one standard deviation (1σ) increase in dependent behavior is associated with a $1632, or 6 percent, decline in earnings. In contrast, there are no penalties for women characterized as dependent; indeed, the coefficient is positive, albeit small ($431) and statistically insignificant. We also observe large and significant earnings penalties for women who exhibited more headstrong behavior in childhood. A 1σ increase in headstrong behavior is associated with a $2092, or 10 percent, decline in earnings. There are no penalties for men characterized as headstrong; again, the

[7] Mother's covariates include dummy variables for each age at birth; dummy variables for education (LTHS, HS some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card.

coefficient is positive, but small ($339) and insignificant. The third column, which is effectively the difference of columns one and two, confirms that the association of dependent and headstrong behavior with earnings is significantly different between males and females.

In the next three columns, we confirm that our results are robust to an alternative specification using the natural logarithm (log) of earnings in the sample of working men and women (i.e., those who worked in the last year and had non-zero earnings). Estimates indicate that a 1σ increase in dependent behavior is associated with an 8.5 percent decline in earnings for men; the corresponding increase of 3.6 percent earnings for women is economically meaningful, but not statistically significant. We also observe that a 1σ increase in headstrong behavior is associated with a 9.9 percent decline in earnings for women; the increase of 3.5 percent earnings for women is again economically meaningful, but statistically insignificant. The final column shows that the labor market returns to being dependent or headstrong are significantly different by gender. The similar pattern of estimates in analyses of earnings using the full sample including those not working and for the sample of those working with positive (log) earnings implies that child behavior problems are not strongly related to employment.

While other child behaviors are also associated with labor market earnings, their associations are generally weaker, less consistent across models, and not significantly different by gender. For example, both men and women suffer earnings penalties for being relatively more hyperactive, anti-social and having more peer conflict, but the gender differences in these associations are not significant and much smaller than those for dependent and headstrong behavior. Similarly, both men and women who are relatively more anxious/depressed as children have higher earnings, but the gender difference is not significant. Note that we did not find significant gender differences in the returns to the overall measure of child behavior problems

(i.e., the BPI), or for externalizing and internalizing behavior. As noted earlier, these results suggest that using the overall measure of behavior problems obscures the effects associated with specific behavior syndromes.

The gender differences in Table 2 are robust to alternative regression specifications, as shown in Appendix Table 3.[8] First, estimates are similar if we restrict the effects of mother/family characteristics on earnings to be the same by gender. This finding, together with the fact that there are few differences in mother/family characteristics by gender, suggests that the estimates in Table 2 are unlikely to be confounded by omitted mother/family factors, or by biases related to maternal reporting of behaviors. The estimates are also qualitatively similar when restricted to earlier (born 1981-84) and later (born 1985-90) cohorts of children, although we lose precision because of the smaller sample sizes. Our results also hold if restrict the sample to observations of earnings from 2010 onwards, after the initial years of the subprime crisis. Finally, our main findings remain unchanged when we include only dependent and headstrong measures omitting other behavioral measures, and when we omit mother and family background characteristics.[9]

We also consider the possibility of multiple testing bias for our "family" of hypotheses related to the gender differences in associations between earnings and our six child behaviors of interest. To the extent that our analysis is exploratory—it is the first to examine gender differences the associations between earnings and these behaviors—it is not clear whether it is necessary to adjust for multiple testing bias because doing so raises the likelihood of a false

[8] Our findings are also robust to using continuous measures of math and reading achievement, excluding measures of math and reading achievement, and using categorical measures of child behaviors instead of continuous measures.
[9] We also examined the effects on low- and high-earnings defined using the 25th and 75th percentiles of pooled (across genders) earnings. Results from these analyses are consistent with the results with our main analysis of earnings suggesting that the gender differences are apparent throughout the earnings distribution.

negative finding (Wason et al. 2014; Guowei et al. 2017). Moreover, the behaviors we study are distinct, and a finding about the association between earnings and one behavior does not have any bearing on the inference and conclusions regarding the relationship between earnings and another behavior (Proschan and Waclawiw 2000).[10]

Nevertheless, to provide some evidence on this issue of multiple testing bias, we adjust the level of significance of our six estimates of gender differences in associations between earnings and child behaviors using the Holm-Bonferroni correction. The p-value associated with the estimate of the gender difference related to dependent behavior ($2063) is 0.014, which after adjustment for six hypotheses (i.e., multiplying p-value by six) is 0.084. While not significant at the conventional 0.05 level, it is close and incorporates a severe penalty for the possibility of any type I error. A similar adjustment applied to the p-value of the estimate for the gender related to headstrong behavior is 0.19. Moreover, these adjustments yield even lower p-values when applied to the estimates from the log earnings specification. Thus, even if we adopt a stringent adjustment for multiple comparison bias, such as the Holm-Bonferroni, the significance levels of estimates of gender differences in associations between earnings and dependent and headstrong behaviors are not far from conventional levels of significance.

Potential mechanisms

What explains the gender differences in the association of child behavior with early adult earnings? To address this question, we first examine the gender differences in the associations of child behaviors with potentially mediating factors that have been shown to affect earnings such

[10] In contrast, if we were interested in inferring whether childhood behaviors broadly construed were associated with earnings, then it would be more important to adjust for multiple testing bias.

as employment, educational attainment, marriage, fertility, health, and personality.[11] Second, we examine whether our estimates of the associations of child behaviors and earnings are moderated by factors that determine workplace settings and may, in turn, relate to prejudice in the workplace.

Mediating Factors

Table 3 presents gender differences in the associations of child behaviors with employment, educational attainment, marriage, fertility, health using the analogous regression models and the same sample as used in Table 2 (the corresponding associations *by gender* are relegated to Appendix Table 4). The first two columns examine whether these gender differences might be driven by employment and work hours. While the gender difference in the associations of headstrong behavior with employment is marginally significant, driven by a 3.6 percentage point reduction in employment for headstrong women shown in Appendix Table 4, it is not sufficient to explain the large earnings differences we observed in Table 2. This fact is evidenced by the estimates of gender differences for headstrong behavior and (log) earnings, which is limited to those working. Moreover, there are no significant gender differences in the association of work hours with either headstrong or dependent behavior.

The next two columns of Table 3 examine educational attainment, measured as years of completed education and attainment of a bachelor's degree. Here, the gender difference in the association of dependent behavior with years of schooling is marginally significant, but again

[11] There are extensive literatures documenting the independent effect of education, marriage, and health on earnings. See, e.g., Card (1999) for education, Ginther and Zavodny (2001) for marriage, and Prinz et al. (2018) for health. We chose to explore potential mechanisms in this manner rather than adding mediators to the earnings regression model because it avoids the "bad control" problem.

insufficient to explain the large earnings difference we observed in Table 2.[12] Moreover, there are not significant gender differences in the association of college completion with either headstrong or dependent behavior. Neither do the following two columns of Table 3 reveal any significant associations between child behavior and the likelihood of marriage or number of children.

The final two columns of Table 3 show large gender differences in the associations of dependent and headstrong behavior with the self-reported likelihood of being in poor health. Indeed, the patterns in Appendix Table 4 indicate that men are 3.2 percentage points more likely to report that they are in poor health with a 1σ increase in dependent behavior. However, it seems unlikely that health represents a potential pathway for explaining the gender differences in how child behavior affects earnings because there are relatively few people in poor health and health often affects earnings through employment (on which we find little effect). Furthermore, we do not observe any significant differences by gender in the likelihood of being in good health.

We also examine the associations of child behavior with measures of depression, self-esteem, mastery, and the Big-5 personality traits in early adulthood.[13] Table 4 presents estimates for the gender differences in the associations of child behavior and scores on these psychological outcomes (with the main effects provided in Appendix Table 5). For our research question, the most important finding revealed by the estimates in Table 4 is the relatively few significant gender differences (only 3 out of a possible 48). Thus, the gender differences in the associations

[12] Assuming a 10% increase in earnings for each year of schooling, the gender difference in schooling between dependent women and men would only result in a 1.5% difference in earnings (approximately one fifth of the gender difference in earnings in Table 2).

[13] Depression is measured using the Center for Epidemiologic Studies Depression (CES-D) scale; mastery is measured using the Pearlin Mastery scale. These variables are measured between ages 18 and 23 in the C-NLSY.

between childhood behavior and earnings do not appear to be mediated by depression, self-esteem, or adult personality.

It is notable that the estimates in Appendix Table 5 do not reveal many strong associations between child behaviors and adult personality traits. This finding contributes to the developmental psychology literature that studies the life course linkages between child temperament and adult personality (e.g., Caspi et al. 2005; Shiner and DeYoung 2013). In contrast to some previous findings, our novel estimates from a large and recent U.S. cohort of children indicate relatively little correlation between child behavioral problems (at ages 4 to 12) and personality traits (at ages 24 to 30).

Finally, in Table 5, we examine the mediating role of occupation (at the 3-digit level) directly, which is a variable that does not lend itself to an analysis similar to that in Table 2. This analysis explores whether occupational sorting mediates the gender differences in associations between headstrong and dependent behavior and earnings. Estimates in Table 5 indicate that adding controls for education and occupation does not appear to affect the estimates of gender differences in the returns to headstrong behavior, although it does reduce the magnitude of the gender differences in the returns to dependent behavior by 30-40 percent. Including other mediators has almost no additional effect. We recognize that any analysis which conditions on education and occupation and other variables reflecting personal choices may introduce bias if these variables are also affected by child behavior differentially by gender or are influenced by earnings (reverse causality). This potential problem also applies when these variables are used as dependent variables, as in Tables 3 and 4. Nevertheless, it does not appear to be the case that our results are explained by occupation or by differences in education and other choices. In other

words, to the extent that there are these gender-specific associations between behavior and earnings, it is happening within occupation and within educational levels.[14]

Moderating Factors

The absence of any evidence that gender differences in the associations between child behaviors and earnings are mediated by a relatively large set of variables known to affect earnings leaves open the question of the mechanism underlying this finding. If the character traits that underlie these child behaviors persist into adulthood, one potential explanation for the gender differences in the associations of dependent and headstrong behavior with earnings is prejudice in the workplace.[15] For example, if children who exhibited behaviors that deviated from gender norms and stereotypes are subsequently penalized in the labor market. We attempt to assess this hypothesis by examining whether gender differences in the labor market returns to dependent and headstrong behaviors differ by education (less vs. more than high school) and occupation (blue-collar vs. white-collar), which are variables that reflect distinct workplace settings and may be related to different views about how behavioral traits are gender-specific.[16] We also examine whether the gender differences we observe depend on whether individuals are employed in occupations that are female-dominated or not (i.e. if the fraction of women is higher than 75 percent).

[14] We also examined whether child behaviors are related to occupational "work styles" as reported in the O*NET database (such as "persistence", "concern for others", and "independence"). We linked this information to occupational indicators in the CNLSY and estimated regression models identical to those in Table 2 using the scores for the importance of occupational worker styles as dependent variables. The vast majority of these coefficients, reported in Appendix Table 6, are insignificant, suggesting that there is very little sorting of individuals to occupations based on these work styles, and essentially no differential sorting by gender.

[15] Presumably, these character traits are not captured by the measures of adult personality available in the CNLSY (given that we do not find a strong correlation between child behaviors and these measures).

[16] For example, data from Pew opinion polls in 2008 and 2014, as well as a GfK poll conducted for Eagly et al (2019), indicate that people with more than a high school education are relatively less likely to associate men with emotional/sensitive traits or women with decisive/stubborn traits as compared to less individuals with less education.

Table 6 presents estimates of the associations of child behaviors with earnings stratified by education, blue vs. white-collar occupations, and female-dominated occupations. The gender differences in labor market returns to dependent and headstrong behavior are large and significant for those with less than a high school education, while substantially smaller among more educated individuals. A similar pattern for the associations between child behaviors and earnings emerges when we stratify by whether a person works in a blue-collar occupation or not: the gender differences in labor market returns to dependent and headstrong behavior are large and significant for those working in a blue-collar occupation, while substantially smaller among those in non-blue-collar jobs.[17] These results provide suggestive evidence that workplace characteristics (such as workplace prejudice) may be related to our findings of gender differences in the associations of dependent and headstrong behavior with earnings. Nevertheless, gender differences do not appear qualitatively different when stratified by whether or not occupations are female-dominated.

Summary

To summarize our main findings, we observe large and significant earnings penalties for women who exhibited more headstrong behavior, and for men who exhibited more dependent behavior, as children. There are no significant or economically meaningful penalties for men who were headstrong or for women who were dependent. While other child behavioral problems are also associated with labor market earnings, their associations are not significantly different by gender. These results are robust to alternative specifications of earnings (e.g., levels or logs)

[17] Interestingly, when estimating the returns to child behavior separately by gender, the earnings penalty for women characterized as headstrong is substantially larger, and only significant among the more educated or those who work in non-blue-collar occupations. The earnings penalty for men characterized as dependent is substantially larger, and only significant, among the less educated and those who work in blue-collar occupations.

and child behaviors (e.g., linear or categorical). The results are also similar with and without adjustment for differences in academic achievement or family background, and when allowing for the effect of family background to differ by gender. While we have been careful to avoid making strong causal claims about the estimated relationships, these sensitivity analyses do assess whether some of the more important potentially confounding influences due to family background are present. Results suggest they are not.[18]

The differential returns to dependent and headstrong behavior by gender are not mediated by significant gender differences in the associations between child behaviors and the likelihood of employment, work hours, marriage, fertility, or self-esteem. Nor do we find gender differences in the associations between child behaviors and adult personality traits, mental health (CESD) or the probability of being in good health. While we do find that men who were characterized as dependent are significantly more likely to report being in poor health, and this association is significantly different from the corresponding one for women, these differentials are too small for health to be a significant mediator of the gender difference in the association between dependent behavior and earnings.

Notably, we find heterogeneous gender differences in the returns to headstrong and dependent behavior by education and occupation. This heterogeneity is suggestive of the role of workplace settings, and perhaps workplace prejudice, in explaining gender differences between these child behaviors and early adult earnings. Thus, one potential explanation of our findings is

[18] Unfortunately, we don't believe there are any feasible quasi-experimental approaches that can isolate exogenous variation in these specific child behaviors, similar to other related studies such as Attanasio, Blundell, Conti, and Mason (2020) Hinshaw (1992), Segal (2008), Diprete and Jennings (2011), Kristoffersen et al. (2015), Owens (2016), and Papageorge, Ronda, and Zheng (2019).

that children who exhibit behaviors that deviate from gender norms and stereotypes may be penalized in the labor market.[19]

In our setting, dependent behavior is more prevalent among girls than boys while headstrong behavior (along with other child behaviors) is more prevalent among boys than girls. At the same time, numerous public opinion surveys suggest that certain traits, such as stubbornness and decisiveness, are more associated with males while other behaviors, such as sensitivity and being emotional, are more associated with females (Eagly et al. 2019). This hypothesis is consistent with the role congruity theory of prejudice, which posits that men and women who behave in ways that are contrary to expected behaviors are often subject to prejudice (Eagly and Karau, 2002; Eagly and Koenig, 2008).[20] Indeed, men and women who do not conform to gender norms and stereotypes in the labor market have been shown to suffer social and economic sanctions (Akerlof and Kranton 2000; Rudman and Glick, 2001; Brescoll and Uhlmann, 2008).

Conclusion

This article adds to the literature on the long-term effects of several distinct child behaviors. We contribute to this literature by describing gender differences in the associations of child behaviors with earnings for a recent national cohort of children in the U.S. Our results are novel. We find that two child behaviors, headstrong and dependent behaviors, have significantly different associations with early adult earnings by gender. The gender differences are large. The labor market returns to a 1σ increase in headstrong behavior during childhood differed by -$2431

[19] Gender norms have also been shown to affect female attachment to paid work, and the choice of field of study and occupation (e.g., Senik and Friedman-Sokuler, 2020).
[20] Role congruity theory may also be applicable to prejudice against those having characteristics that deviate from gender norms, such as physical appearance (Blakemore, 2003) or names (Figlio, 2007).

(female minus male), with women characterized as headstrong suffering large earnings penalties. This figure represents approximately 40% of the gap between male and female average earnings. At the same time, the labor market returns to a 1σ increase in dependent behavior during childhood differed by $2036 (female minus male), with men characterized as headstrong suffering large earnings penalties. This figure represents 36% of the male-female earnings gap.

We have been careful throughout this article to refer to the relationships between child behaviors and adult outcomes as associations. They do not necessarily reflect causal relationships. However, our measures of child behavior are measured early in life, and our results are similar whether we include or omit academic achievement and family background characteristics, and whether we allow or constrain family background characteristics to have the same effects by gender. Therefore, while we cannot rule out the possibility that other unmeasured factors are confounding our estimates, the evidence presented above suggests that this may not be a serious problem. It is also important to note that we use earnings measured relatively early in adult lives and may therefore not fully capture lifecycle earnings (even though we control for age).

Our novel findings contribute to the growing literature on the potential causes of the gender wage gap (Blau and Khan 2017).[21] Other studies have shown that gender differences in adult personality and the returns to those traits can explain a significant part of the gender wage gap (Filer 1983; Nyhus and Pons, 2005; Braakmann 2009; Heineck 2011; Mueller and Plug, 2006).[22] We focus on specific child behaviors, which have not been previously examined, and

[21] While we show large gender differences in associations between headstrong and dependent behavior and earnings, these differences can explain only a small amount of the gender gap in earnings because of relatively small differences between genders in these behaviors.

[22] A related literature explores whether the gender wage gap is due to gender differences in negotiations (Babcock and Laschever, 2003), educational choices (Zafar, 2013), or because women shy away from competitions (Niederle and Vesterlund, 2007),

how these behaviors affect early adult earnings. Moreover, we provide a set of facts to motivate future research on the underlying mechanisms for the gender differences that we do (and do not) observe. Notably, our analyses rule out several mediating pathways. It does not appear that the gender differences in the associations between these child behaviors and earnings are explained by education, marriage, depression, self-esteem, health, occupation, or adult personality traits. Moreover, our measures of child behavior are not highly correlated with the adult personality traits, suggesting that they reflect distinct attributes that affect earnings.

However, we do find that gender differences in the labor market returns to these behaviors differ markedly by education and occupation, suggesting that the workplace, and perhaps workplace prejudice, could be a potential explanation. We acknowledge that more research is necessary to distinguish this hypothesis from alternative explanations. For example, do the moderating effects of gender arise because of differences in actual productivity, or is it because colleagues and supervisors have negative perceptions of headstrong women and dependent men? The former could arise if behavior is more pronounced by gender while the latter is consistent with a bias due to non-conforming gender behaviors (Eagly and Karau, 2002; Eagly, 2004, Eagly and Koenig, 2008).

Another important question is why other child behaviors, such as hyperactive, anti-social, and peer conflict, do not differ in their associations with earnings by gender? While not as strongly correlated with earnings as headstrong behavior, these behaviors are more prevalent among boys than girls and significantly correlated with adult earnings in some specifications. So why is the moderating role of gender absent in the case of these behaviors? Perhaps these behaviors are less associated with adult gender stereotypes and therefore not perceived as gender non-conforming behaviors. Or perhaps these behaviors do not lead to negative perceptions on the

job because they do not affect social interactions. Further research is needed to answer these questions as well.

Finally, as noted earlier, the child behaviors we examine are well defined in the child developmental literature, and there is a large literature discussing the biological, social and economic determinants of these and related behaviors. Children with greater behavioral problems tend to come from poorer families and behaviors are strongly associated with parenting style (Campbell 1995; Huaqing and Kaiser 2003). While we do not know to what extent these specific child behaviors are malleable and, if so, at what ages, there is evidence that other child behavioral characteristics can be altered through interventions (such as the Becoming a Man program in Chicago) so it seems plausible that headstrong and dependent behavior are at least partially malleable and may be affected by policy.

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Table 1: Sample Means/Proportions of Child and Mother Characteristics by Gender

Child Characteristics	Male	Female	Female-Male Difference	P-value	Standardized Difference
Non-Hispanic Black	0.31	0.35	0.05	0.01	0.07
Non-Hispanic White	0.46	0.43	-0.02	0.24	-0.03
Hispanic	0.24	0.21	0.03	0.10	-0.04
Birth Year	1984.6	1984.4	0.19	0.02	-0.05
Birth Order	1.86	1.84	-0.02	0.60	0.01
Age at time of Adult Interview	26.4	26.5	-0.08	0.01	0.03
Behavioral Problem Subscales (avg. of ages 4-12)					
Dependent	1.30	1.42	0.12	0.001	0.09
Head Strong	2.50	2.22	-0.27	0.001	-0.15
Anti-Social	1.70	1.26	-0.44	0.001	-0.26
Anxious	1.62	1.66	0.04	0.370	0.02
Hyperactive	2.16	1.66	-0.50	0.001	-0.29
Peer Conflict	0.55	0.46	-0.09	0.001	-0.10
PIAT Achievement Test Scores (avg. of ages 5-13)					
Math "Raw" Score	36.1	36.0	-0.08	0.800	-0.01
Reading Comprehension "Raw" Score	35.1	36.5	1.49	0.001	0.11
Mother's/Family's Characteristics					
Mother's Age at Birth	23.6	23.3	-0.32	0.005	-0.07
Mother <12 Years of Completed Education	0.24	0.23	0.00	0.76	-0.01
Mother=12 Years of Completed Education	0.41	0.40	-0.01	0.47	-0.02
Mother 13-15 Years of Completed Education	0.23	0.26	-0.03	0.13	0.04
Mother 16 Years or More of Completed Education	0.11	0.11	0.00	0.68	-0.01
Mother's AFQT Percentile Score in 1981	35.4	34.3	-1.09	0.26	-0.03
Mother Never Married in Year of Birth	0.27	0.32	0.05	0.005	0.07
Mother Separated Divorced in Year of Birth	0.08	0.08	0.00	0.790	-0.01
Mother Married in Year of Birth	0.65	0.61	-0.05	0.010	-0.07
Mother's Locus of Control Score in 1979	8.9	9.0	0.13	0.14	0.04
Mother's Self-esteem Score in 1980	21.9	21.8	-0.08	0.59	-0.01
Child's Household had Library Card	0.66	0.71	0.05	0.001	0.08
Child's Household had Magazines	0.50	0.50	-0.00	0.910	-0.00
Child's Household had Newspapers	0.70	0.71	0.01	0.750	0.01
Number of Observations	3557	3726	7283		

: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. Where applicable, column sums may not add to 100% because of rounding. Similarly, differences between males and females may not be exact due to rounding. The standardized difference is calculated using: [mean(M)-mean(F)]/[sqrt(var(M)+var(F))]. ** p-value<=0.05

Table 2: Estimates of Associations between Child Behavior and Adult Earned Income

	Annual Earnings			Natural Logarithm Earnings (Eaarnings>0)		
	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	-1632**	431	2063**	-0.085**	0.036	0.121**
	(662)	(544)	(856)	(0.027)	(0.026)	(0.038)
Headstrong	339	-2092**	-2431**	0.035	-0.099**	-0.134**
	(926)	(710)	(1167)	(0.036)	(0.034)	(0.050)
Antisocial	-1034	-123	911	-0.082**	-0.023	0.059
	(765)	(679)	(1023)	(0.033)	(0.040)	(0.052)
Anxious/Depressed	1313	210	-1103	0.052	0.053*	0.001
	(808)	(660)	(1043)	(0.034)	(0.031)	(0.046)
Hyperactive	-1036	-925	111	-0.030	-0.066*	-0.037
	(793)	(636)	(1016)	(0.033)	(0.034)	(0.048)
Peer Conflict	-1308**	-909	399	-0.053*	-0.046	0.007
	(659)	(573)	(874)	(0.031)	(0.034)	(0.046)
Mean of Dep. Variable	26746	20847		10.02	9.81	
(standard deviation)	(24388)	(19628)		(0.97)	(0.98)	
Number of observations	3557	3726	7283	3053	3054	6107

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Table 3: Estimates of Associations between Child Behavior and Employment, Education, Marital Status, Health and Number of Children

	Employed at Time of Interview Female-Male	Hours of Work Week of Interview (Hours>0) Female-Male	Years of Completed Education Female-Male	Bachelor's Degree of More Female-Male	Married Female-Male	Poor Health Female-Male	Good Health Female-Male	Number of Children Female-Male
Dependent	0.020	0.536	0.161*	0.002	-0.024	-0.027**	0.001	-0.006
	(0.017)	(0.540)	(0.094)	(0.013)	(0.018)	(0.013)	(0.015)	(0.049)
Headstrong	-0.034*	0.730	-0.066	-0.011	-0.007	0.027*	-0.001	0.067
	(0.021)	(0.676)	(0.123)	(0.018)	(0.024)	(0.016)	(0.019)	(0.060)
Antisocial	0.032	-1.305**	0.083	-0.001	0.025	-0.012	0.028	0.004
	(0.021)	(0.649)	(0.121)	(0.016)	(0.023)	(0.018)	(0.019)	(0.065)
Anxious/Depressed	-0.005	-0.712	-0.092	-0.018	0.011	-0.011	-0.046**	0.047
	(0.019)	(0.682)	(0.113)	(0.015)	(0.022)	(0.016)	(0.018)	(0.058)
Hyperactive	0.009	-0.136	0.021	0.016	-0.021	0.000	0.011	-0.026
	(0.021)	(0.613)	(0.115)	(0.015)	(0.021)	(0.016)	(0.018)	(0.057)
Peer Conflict	-0.007	0.421	-0.094	-0.011	-0.013	0.024	-0.002	0.056
	(0.019)	(0.575)	(0.104)	(0.014)	(0.020)	(0.016)	(0.015)	(0.053)
Mean of Dep. Variable	0.72	40.7	11.1	0.15	0.26	0.14	0.20	0.87
(standard deviation)		(12.5)	(4.0)					
Number of Obs.	7283	5194	7283	7283	7283	7283	7283	7283

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Table 4: Estimates of Gender Differences in Association between Child Behavior, Math and Reading Achievement and Depression, Mastery, Self-Esteem and Personality

	Depression (CESD) Female-Male	Pearlin Mastery Female-Male	Self-esteem Female-Male	Extroversion Female-Male	Openness Female-Male	Agreeableness Female-Male	Conscientiousness Female-Male	Emotional Stability Female-Male
Dependent	-0.035	-0.109	0.340*	0.048	-0.001	0.031	-0.000	-0.039
	(0.178)	(0.129)	(0.199)	(0.062)	(0.050)	(0.050)	(0.051)	(0.059)
Headstrong	0.110	-0.115	0.123	-0.079	0.045	-0.063	-0.034	0.072
	(0.224)	(0.163)	(0.253)	(0.078)	(0.062)	(0.064)	(0.060)	(0.071)
Antisocial	0.032	0.072	-0.216	0.163**	-0.024	0.040	-0.001	-0.051
	(0.231)	(0.166)	(0.255)	(0.078)	(0.061)	(0.063)	(0.062)	(0.075)
Anxious/Depressed	0.155	0.101	-0.229	0.088	-0.055	0.025	-0.065	-0.092
	(0.221)	(0.157)	(0.242)	(0.073)	(0.060)	(0.059)	(0.059)	(0.069)
Hyperactive	0.255	0.049	-0.107	-0.059	-0.006	-0.084	0.025	0.013
	(0.221)	(0.149)	(0.234)	(0.075)	(0.059)	(0.060)	(0.058)	(0.066)
Peer Conflict	-0.358	0.007	-0.020	-0.089	-0.018	-0.017	0.002	0.129**
	(0.218)	(0.160)	(0.240)	(0.071)	(0.054)	(0.057)	(0.055)	(0.064)
Mean of Dep. Variable	4.7	13.3	32.7	4.6	5.4	5.1	5.8	5.1
(standard deviation)	(3.8)	(2.8)	(4.2)	(1.4)	(1.1)	(1.2)	(1.1)	(1.3)
Number of Observations	3128	3128	3128	4103	4121	4070	4125	4120

Notes: Sample includes children born between 1981 and 1990. For CESD, Pearlin Mastery and Self-esteem measures, respondents are between ages 18 and 23 because information on Pearlin and Self-esteem was not obtained in all survey years (available in 1998 and 2004). For measures of personality traits, information was available in 2006, 2010 and 2014 and respondent is observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Table 5: Mediation Analysis
Estimates of Associations between Child Behavior and Adult Earned Income Controlling for Potential Mediators

	Estimate from Primary Analysis Female-Male	Restricted to Sample with Occupation	Include Occupation Female-Male	Include Occupation and Education Female-Male	Include Additional Mediators* Female-Male
Dependent	2063**	1982**	1409*	1382*	1201
	(856)	(880)	(814)	(810)	(800)
Headstrong	-2431**	-1963	-2323**	-2214**	-2074*
	(1167)	(1200)	(1083)	(1068)	(1059)
Antisocial	911	886	1045	1208	1513
	(1023)	(1066)	(978)	(967)	(947)
Anxious/Depressed	-1103	-1429	-552	-598	-546
	(1043)	(1081)	(990)	(982)	(962)
Hyperactive	111	-363	56	121	104
	(1016)	(1037)	(954)	(946)	(932)
Peer Conflict	399	327	203	315	64
	(874)	(895)	(837)	(833)	(821)
Mean of Dep. Variable	26746	26103	26103	26103	26103
(standard deviation)	(24388)	(22030)	(22030)	(22030)	(22030)
Number of observations	7283	6469	6469	6469	6469

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. Unless indicated, all regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

*Mediators include: occupation dummy variables (2-digit), education dummy variables (LTHS, HS, SC, BA), Marital Status (married, never married, other), dummy variables for number of children, and indicator of poor health.

Table 6: Heterogeneity (Moderation) Analysis
Estimates of Associations between Child Behavior and Adult Earned Income by Education and Occupational Characteristics

	Estimates Primary Analysis Female-Male	<HS Female-Male	>=HS Female-Male	Blue Collar Female-Male	Not Blue Collar Female-Male	>=75% Female Occupation Female-Male	<75% Female Occupation Female-Male
Dependent	2063**	3198**	899	2399**	1713	2622	2079*
	(856)	(1094)	(1080)	(1023)	(1383)	(1662)	(1090)
Headstrong	-2431**	-3151**	-1498	-2715*	-625	-1772	-2543*
	(1167)	(1517)	(1442)	(1512)	(1657)	(1748)	(1445)
Antisocial	911	2282*	-62	1514	-396	-3987**	2223*
	(1023)	(1282)	(1293)	(1282)	(1563)	(1926)	(1300)
Anxious/Depressed	-1103	-1539	-911	-732	-1854	1234	-968
	(1043)	(1346)	(1271)	(1320)	(1478)	(1890)	(1336)
Hyperactive	111	-793	472	683	-1226	-1985	-1035
	(1016)	(1289)	(1270)	(1291)	(1572)	(1936)	(1225)
Peer Conflict	399	905	-12	1459	30	1508	-162
	(874)	(1114)	(1085)	(1086)	(1289)	(1923)	(1097)
Mean of Dep. Variable	23728	22611	24424	22478	28932	20994	27587
(standard deviation)	(22276)	(23170)	(21674)	(20360)	(22856)	(16193)	(23227)
Number of observations	7283	2794	4489	2836	3633	1640	4773

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Appendix Table 1: Behavior Problems Index (BPI) questions and subscales

Question	Subscale
(He or She) clings to adults	Dependent
(He or She) cries too much	Dependent
(He or She) demands a lot of attention	Dependent
(He or She) is too dependent on others	Dependent
(He or She) is rather high strung, tense, and nervous	Headstrong
(He or She) argues too much	Headstrong
(He or She) is disobedient at home	Headstrong
(He or She) is stubborn, sullen, or irritable	Headstrong
(He or She) has strong temper and loses it easily	Headstrong
(He or She) cheats or tells lies	Antisocial
(He or She) bullies or is cruel/mean to others	Antisocial
(He or She) does not seem to feel sorry after misbehaving	Antisocial
(He or She) breaks things deliberately	Antisocial
(He or She) is disobedient at school (>5 yrs)	Antisocial
(He or She) has trouble getting along with teachers (>5 yrs)	Antisocial
(He or She) has sudden changes in mood or feeling	Anxious/Depressed
(He or She) feels/complains no one loves him/her	Anxious/Depressed
(He or She) is too fearful or anxious	Anxious/Depressed
(He or She) feels worthless or inferior	Anxious/Depressed
(He or She) is unhappy, sad, or depressed	Anxious/Depressed
(He or She) has difficulty concentrating/paying attention	Hyperactive
(He or She) is easily confused, seems in a fog	Hyperactive
(He or She) is impulsive or acts without thinking	Hyperactive
(He or She) has trouble getting mind off certain thoughts	Hyperactive
(He or She) is restless, overly active, cannot sit still	Hyperactive
(He or She) has trouble getting along with other children	Peer Conflict
(He or She) is not liked by other children	Peer Conflict
(He or She) is withdrawn, does not get involved with others	Peer Conflict

Appendix Table 2: Estimates of Associations between Child Behavior and Maternal characteristics

	Mom Age at Birth Female-Male	Mom has LTHS Female-Male	Mom has BA Female-Male	Mom's AFQT Female-Male	Mom Married Female-Male	Mom's Locus of Control Female-Male
Dependent	-0.199	-0.031	0.004	1.724	0.050**	0.023
	(0.135)	(0.019)	(0.011)	(1.167)	(0.022)	(0.114)
Headstrong	0.000	0.001	-0.013	-0.637	0.002	0.053
	(0.175)	(0.023)	(0.016)	(1.466)	(0.026)	(0.143)
Antisocial	0.053	0.006	-0.013	-2.502	-0.038	-0.041
	(0.171)	(0.025)	(0.014)	(1.487)	(0.029)	(0.134)
Anxious/Depressed	0.255	-0.025	0.056**	3.644**	-0.007	-0.134
	(0.164)	(0.022)	(0.016)	(1.506)	(0.026)	(0.137)
Hyperactive	-0.156	0.031	-0.008	-0.606	-0.009	0.080
	(0.160)	(0.021)	(0.015)	(1.396)	(0.026)	(0.132)
Peer Conflict	-0.048	0.036	-0.022	-2.294	0.001	0.054
	(0.152)	(0.022)	(0.013)	(1.342)	(0.025)	(0.130)
Number of Obs.	6159	6159	6159	6159	6159	6159

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Appendix Table 3. Sensitivity Analysis
Estimates of Associations between Child Behavior and Adult Earned Income

	Estimate Primary Analysis Female-Male	Restrict Family Background Female-Male	Child Born 1981-84 Female-Male	Child Born 1985-90 Female-Male	Dependent and Head Strong Only Female-Male	No Mother or Family Background Female-Male
Dependent	2063**	1955**	1362	3491**	2004**	2066**
	(856)	(874)	(1230)	(1114)	(806)	(877)
Headstrong	-2431**	-2106*	-2785*	-2332	-2018**	-2290**
	(1167)	(1144)	(1652)	(1636)	(819)	(1159)
Antisocial	911	932	1873	319		1136
	(1023)	(1015)	(1463)	(1385)		(1041)
Anxious/Depressed	-1103	-1313	-448	-1970		-1046
	(1043)	(1040)	(1585)	(1287)		(1038)
Hyperactive	111	109	382	-579		-67
	(1016)	(1005)	(1538)	(1273)		(1017)
Peer Conflict	399	90	-507	1226		-211
	(874)	(883)	(1250)	(1150)		(891)
Mean of Dep. Variable	23728	23728	23695	23769	23728	23728
(standard deviation)	(22276)	(22276)	(22479)	(22033)	(22276)	(22276)
Number of observations	7283	7283	3973	3310	7283	7283

Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

Appendix Table 4: Estimates of Associations between Child Behavior and Employment, Education, Marital Status, Health and Number of Children

	Employed at Time of Interview			Years of Education			Bachelor's Degree of More		
	Males	Females	Female-Male	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	-0.005	0.015	0.020	0.055	0.215**	0.161*	0.007	0.009	0.002
	(0.012)	(0.012)	(0.017)	(0.068)	(0.065)	(0.094)	(0.008)	(0.010)	(0.013)
Headstrong	-0.002	-0.036**	-0.034*	-0.078	-0.144*	-0.066	-0.008	-0.019	-0.011
	(0.014)	(0.015)	(0.021)	(0.089)	(0.084)	(0.123)	(0.012)	(0.014)	(0.018)
Antisocial	-0.034**	-0.002	0.032	-0.273**	-0.190**	0.083	-0.016*	-0.017	-0.001
	(0.013)	(0.016)	(0.021)	(0.083)	(0.088)	(0.121)	(0.010)	(0.013)	(0.016)
Anxious/Depressed	0.023*	0.017	-0.005	0.147*	0.056	-0.092	0.013	-0.004	-0.018
	(0.013)	(0.014)	(0.019)	(0.082)	(0.079)	(0.113)	(0.010)	(0.012)	(0.015)
Hyperactive	-0.027*	-0.018	0.009	-0.235**	-0.214**	0.021	-0.031**	-0.015	0.016
	(0.014)	(0.016)	(0.021)	(0.078)	(0.084)	(0.115)	(0.010)	(0.012)	(0.015)
Peer Conflict	-0.013	-0.021	-0.007	-0.022	-0.116	-0.094	-0.004	-0.016	-0.011
	(0.012)	(0.015)	(0.019)	(0.071)	(0.075)	(0.104)	(0.009)	(0.011)	(0.014)
Mean of Dep. Variable (standard deviation)	0.72	0.71		10.7	11.5		0.12	0.17	
Number of Obs.	3557	3726	7283	3557	3726	7283	3557	3726	7283
	Married			Poor Health			Number of Children		
	Males	Females	Female-Male	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	0.011	-0.012	-0.024	0.032**	0.005	-0.027**	-0.028	-0.034	-0.006
	(0.012)	(0.013)	(0.018)	(0.009)	(0.010)	(0.013)	(0.033)	(0.036)	(0.049)
Headstrong	-0.007	-0.014	-0.007	-0.017	0.010	0.027*	-0.013	0.054	0.067
	(0.016)	(0.018)	(0.024)	(0.011)	(0.012)	(0.016)	(0.039)	(0.046)	(0.060)
Antisocial	0.000	0.025	0.025	-0.002	-0.014	-0.012	0.145**	0.149**	0.004
	(0.014)	(0.018)	(0.023)	(0.011)	(0.014)	(0.018)	(0.037)	(0.053)	(0.065)
Anxious/Depressed	0.008	0.019	0.011	0.016	0.005	-0.011	-0.045	0.002	0.047
	(0.014)	(0.017)	(0.022)	(0.012)	(0.011)	(0.016)	(0.038)	(0.043)	(0.058)
Hyperactive	-0.002	-0.023	-0.021	0.012	0.012	0.000	0.007	-0.019	-0.026
	(0.014)	(0.015)	(0.021)	(0.011)	(0.012)	(0.016)	(0.033)	(0.046)	(0.057)
Peer Conflict	-0.020	-0.032**	-0.013	-0.000	0.023*	0.024	-0.088**	-0.032	0.056
	(0.013)	(0.016)	(0.020)	(0.011)	(0.012)	(0.016)	(0.031)	(0.043)	(0.053)
Mean of Dep. Variable (standard deviation)	0.23	0.29		0.13	0.15		0.67	1.1	
Number of Obs.	3557	3726	7283	3557	3726	7283	3557	3726	7283

See notes to Table 3 in text.

Appendix Table 5: Estimates of Associations between Child Behavior, Math and Reading Achievement and Education, Marital Status, and Health

	Depression (CESD)			Pearlin Mastery			Self-Esteem		
	Males	Females	Female-Male	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	-0.047	-0.082	-0.035	0.021	-0.088	-0.109	-0.040	0.301**	0.340*
	(0.117)	(0.134)	(0.178)	(0.093)	(0.090)	(0.129)	(0.144)	(0.138)	(0.199)
Headstrong	0.000	0.110	0.110	0.057	-0.059	-0.115	-0.035	0.088	0.123
	(0.154)	(0.162)	(0.224)	(0.116)	(0.115)	(0.163)	(0.181)	(0.176)	(0.253)
Antisocial	-0.121	-0.089	0.032	-0.071	0.001	0.072	0.186	-0.029	-0.216
	(0.139)	(0.185)	(0.231)	(0.107)	(0.127)	(0.166)	(0.163)	(0.196)	(0.255)
Anxious/Depressed	0.126	0.281*	0.155	0.007	0.108	0.101	-0.027	-0.256	-0.229
	(0.144)	(0.168)	(0.221)	(0.113)	(0.109)	(0.157)	(0.166)	(0.176)	(0.242)
Hyperactive	0.182	0.437**	0.255	0.299**	0.348**	0.049	-0.322**	-0.429**	-0.107
	(0.138)	(0.173)	(0.221)	(0.104)	(0.107)	(0.149)	(0.161)	(0.171)	(0.234)
Peer Conflict	0.293**	-0.065	-0.358	0.138	0.145	0.007	-0.318**	-0.338*	-0.020
	(0.134)	(0.172)	(0.218)	(0.108)	(0.118)	(0.160)	(0.162)	(0.177)	(0.240)
Mean of Dep. Variable	4.3	5.1		13.2	13.4		32.9	32.6	
(standard deviation)	(3.4)	(4.0)		(2.8)	(2.8)		(4.2)	(4.3)	
Number of Obs.	1529	1599	3128	1529	1599	3128	1529	1599	3128
	Extroversion			Openness			Agreeableness		
	Males	Females	Female-Male	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	-0.033	0.016	0.048	-0.029	-0.030	-0.001	-0.010	0.021	0.031
	(0.046)	(0.041)	(0.062)	(0.037)	(0.034)	(0.050)	(0.036)	(0.034)	(0.050)
Headstrong	0.127**	0.048	-0.079	0.044	0.089**	0.045	-0.010	-0.073*	-0.063
	(0.055)	(0.055)	(0.078)	(0.047)	(0.041)	(0.062)	(0.047)	(0.044)	(0.064)
Antisocial	0.055	0.218**	0.163**	0.084**	0.061	-0.024	-0.059	-0.019	0.040
	(0.052)	(0.058)	(0.078)	(0.040)	(0.046)	(0.061)	(0.041)	(0.048)	(0.063)
Anxious/Depressed	-0.134**	-0.046	0.088	-0.058	-0.113**	-0.055	-0.034	-0.009	0.025
	(0.052)	(0.051)	(0.073)	(0.045)	(0.040)	(0.060)	(0.041)	(0.043)	(0.059)
Hyperactive	0.003	-0.055	-0.059	-0.039	-0.045	-0.006	0.053	-0.031	-0.084
	(0.053)	(0.053)	(0.075)	(0.042)	(0.042)	(0.059)	(0.042)	(0.042)	(0.060)
Peer Conflict	-0.096**	-0.184**	-0.089	0.012	-0.006	-0.018	0.025	0.009	-0.017
	(0.047)	(0.053)	(0.071)	(0.037)	(0.039)	(0.054)	(0.038)	(0.043)	(0.057)
Mean of Dep. Variable	4.5	4.7		5.4	5.4		4.8	5.3	
(standard deviation)	(1.4))	(1.4)		(1.2)	(1.1)		(1.2)	(1.1)	
Number of Obs.	2028	2075	4103	2035	2086	4121	2011	2059	4070

See notes to Table 4 in text.

Appendix Table 5, Continued

	Conscientiousness			Emotional Stability		
	Males	Females	Female-Male	Males	Females	Female-Male
Dependent	-0.001	-0.001	-0.000	0.002	-0.037	-0.039
	(0.036)	(0.036)	(0.051)	(0.042)	(0.041)	(0.059)
Headstrong	0.067	0.034	-0.034	-0.077	-0.005	0.072
	(0.045)	(0.040)	(0.060)	(0.049)	(0.052)	(0.071)
Antisocial	0.031	0.030	-0.001	0.059	0.008	-0.051
	(0.040)	(0.047)	(0.062)	(0.045)	(0.059)	(0.075)
Anxious/Depressed	0.007	-0.058	-0.065	-0.012	-0.104**	-0.092
	(0.042)	(0.041)	(0.059)	(0.047)	(0.050)	(0.069)
Hyperactive	-0.168**	-0.143**	0.025	-0.029	-0.015	0.013
	(0.040)	(0.042)	(0.058)	(0.044)	(0.050)	(0.066)
Peer Conflict	-0.010	-0.008	0.002	-0.155**	-0.026	0.129**
	(0.037)	(0.041)	(0.055)	(0.041)	(0.049)	(0.064)
Mean of Dependent Variable	5.7	5.9		5.3	5.0	
(standard deviation)	(1.1)	(1.1)		(1.3)	(1.3)	
Number of Observations	2040	2085	4125	2033	2087	4120

See notes to Table 4 in text.

Appendix Table 6: Estimates of Associations between Child Behavior and Work Styles

	Achievement /Effort Female-Male	Persistence Female-Male	Initiative Female-Male	Leadership Female-Male	Cooperation Female-Male	Concern for Others Female-Male	Social Orientation Female-Male	Self-Control Female-Male
Dependent	-0.004	-0.017	0.001	0.003	-0.012	-0.016	0.003	0.002
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Headstrong	-0.009	0.016	0.015	-0.003	0.004	0.014	-0.002	0.008
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Antisocial	0.001	-0.013	-0.015	-0.006	-0.02	-0.008	-0.004	-0.002
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Anxious/Depressed	-0.021	-0.021	-0.035	-0.005	-0.015	-0.014	-0.008	-0.003
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Hyperactive	0.003	0.003	-0.012	-0.004	0.016	0.012	0.006	-0.012
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Peer Conflict	0.021	0.019	0.013	0.019*	0.011	0.009	0.008	0.007
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Number of Obs.	6159	6159	6159	6159	6159	6159	6159	6159

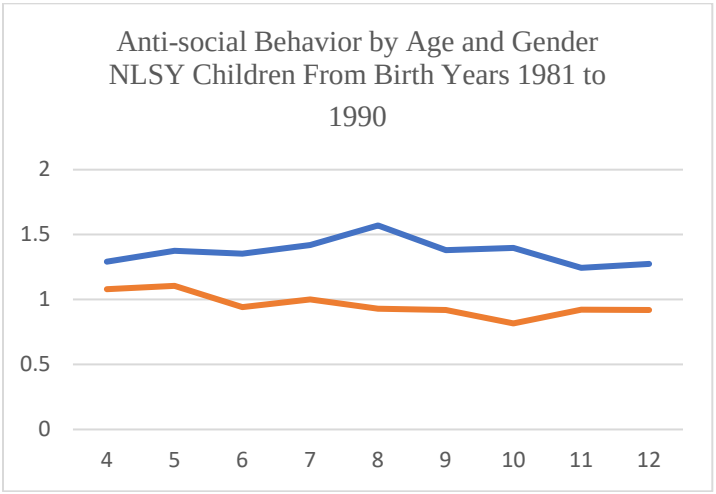
Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

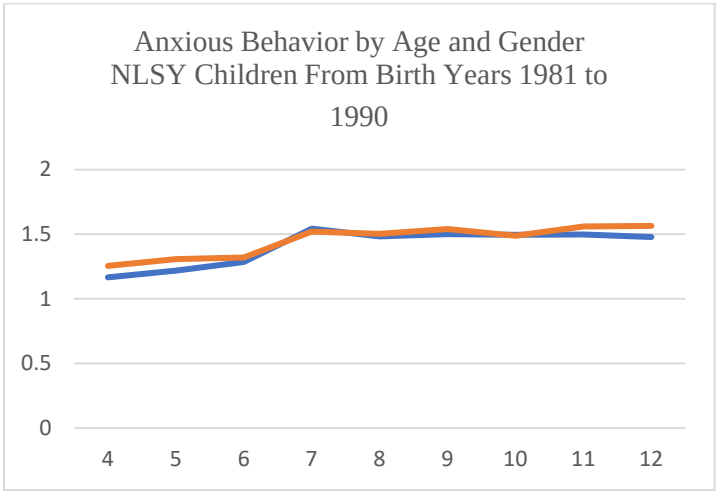
Appendix Table 6 (cont.): Estimates of Associations between Child Behavior and Work Styles

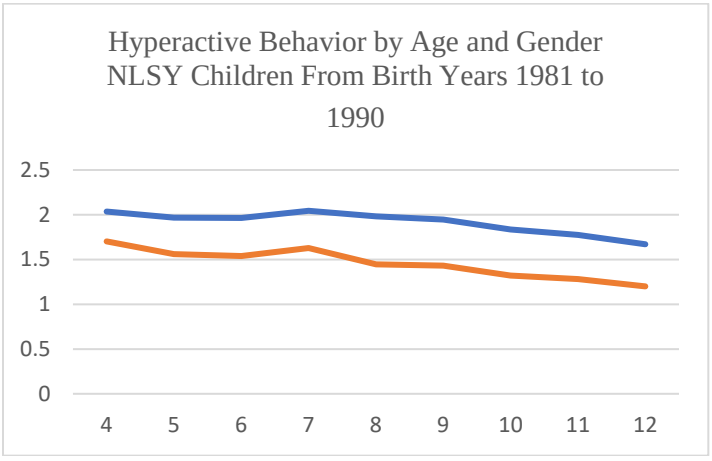
	Stress-Tolerance Female-Male	Adaptability /Flexibility Female-Male	Dependability Female-Male	Attention to Detail Female-Male	Integrity Female-Male	Independence Female-Male	Innovation Female-Male	Analytical-Thinking Female-Male
Dependent	-0.008	-0.017	-0.003	-0.024	-0.005	-0.018	-0.037**	-0.021
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Headstrong	-0.001	0.023	0.007	0.018	-0.007	0.007	0.003	0.011
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Antisocial	0.00	-0.035	-0.006	-0.022	-0.008	-0.001	-0.011	-0.002
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Anxious/Depressed	-0.012	-0.004	-0.025	-0.011	-0.02	-0.009	-0.007	-0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Hyperactive	-0.009	-0.024	0.003	0.001	0.001	0.022	0.026	0.029*
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
Peer Conflict	0.005	0.018	0.001	0.011	0.013	-0.004	0.018	0.003
	(0.01)	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)
Number of Obs.	6159	6159	6159	6159	6159	6159	6159	6159

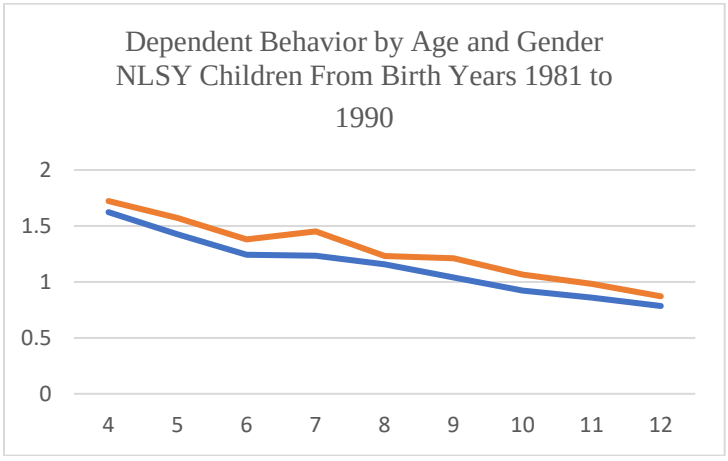
Notes: Sample includes children born between 1981 and 1990 and observed as an adult between ages of 24 to 30. All regression models include dummy variables for child's race (white, black, Hispanic), each year of age, each birth year and each birth order, and quartiles of PIAT math and reading scores. Regressions also include mother's characteristics: dummy variables for each age at birth; dummy variables for education (LTHS, HS, some college, BA or more); AFQT score and its square; marital status at birth (married, never married, other); dummy variables for quartile of self-esteem scale; dummy variables for quartile of Rotter scale; and dummy variables indicating whether household of child had magazines, newspapers and a library card. Child behaviors are measured in standard deviation units. Robust standard errors clustered within person in parentheses. * 0.10<=p-value<0.05, ** p-value<=0.05.

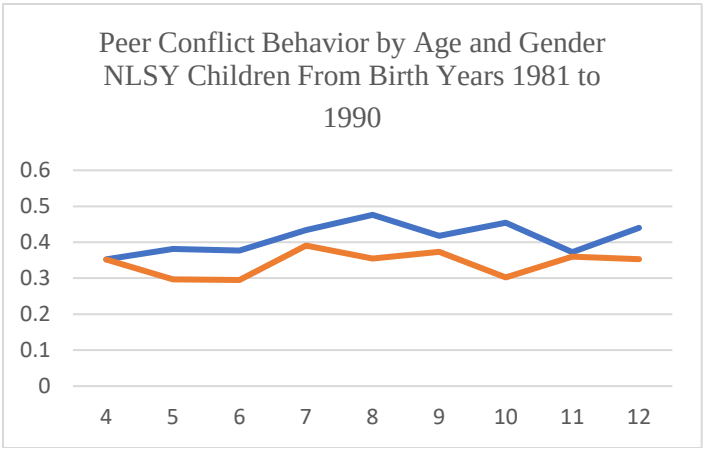
Appendix Figure 1. Behavioral Problems Sub-scales by Age and Gender

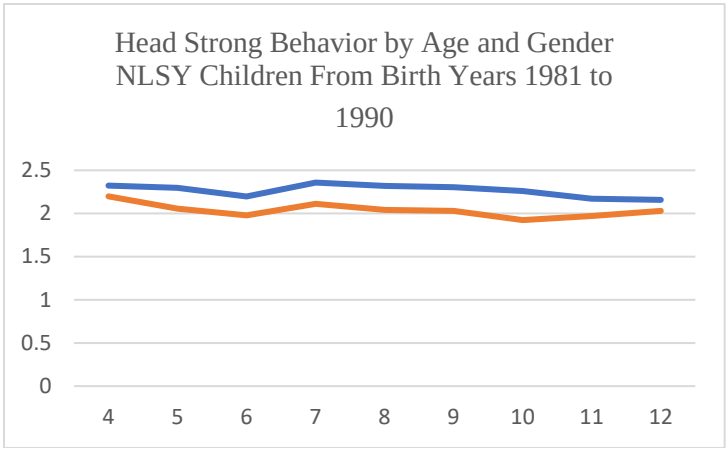












Note: blue lines represent boys; orange lines represent girls.