

The Brother Earnings Penalty

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Abstract

This paper examines the impact of sibling gender on adolescent experiences and adult labor market outcomes for a recent cohort of U.S. women. We document an earnings penalty from the presence of a younger brother (relative to a younger sister), finding that a next-youngest brother reduces adult earnings by about 7 percent. Using rich data on parent-child interactions, parents' expectations, disruptive behaviors, and adult outcomes, we provide a first step at examining the mechanisms behind this result. We find that brothers reduce parents' expectations and school monitoring of female children while also increasing females' propensity to engage in more traditionally feminine tasks. These factors help explain a portion of the labor market penalty from brothers.

Key words: sibling gender, gender roles, earnings

JEL classification: J13, J16, J31

1 Introduction

Growing up with a brother relative to a sister can strongly influence environment. The presence of a male (versus female) sibling can affect parents' treatment of the remaining children, the division of household tasks and development of interests, and even indirectly affect family size. Traditional economic theories suggest that a male sibling may pull parental investment of time, money, or expectations away from females, because boys may be seen as the "higher return" investment (Becker, 1991), or because their more disruptive behavior may change parental expectations for all siblings (Powell & Steelman, 1990). At the same time, psychological evidence indicates that mixed sex environments create stronger gender differentiation (McGuire, McGuire, & Winton, 1979; Cota & Dion, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Abrams, Thomas, & Hogg, 1990; Schneeweis & Zweimüller, 2012; Booth, Cardona, & Nolen, 2013) and, as a result, brothers may cause girls to develop more traditionally feminine behaviors and attitudes and become closer to their mothers relative to their fathers (Grotevant, 1978; Brody & Steelman, 1985; McHale, Crouter, & Tucker, 1999). Finally, brothers may influence parents' fertility choices (if parents have preferences for a child of a specific sex) (Angrist & Evans, 1998; Dahl & Moretti, 2008; Blau, Kahn, Brummund, Cook, & Larson-Koester, 2017).

In this paper, we examine the impact of sibling gender on home environment and adult earnings for a recent cohort of women in the United States. We investigate mechanisms including parental investment, gendered attitudes and behaviors, and participation in risky behaviors.

The existing literature on the impacts of sibling gender focuses largely on cohorts born before 1970, finding no consistent impact of sibling gender on women's educational or labor market outcomes (Butcher & Case, 1994; Kaestner, 1997; Hauser & Kuo, 1998; Conley, 2000; Anelli & Peri, 2015; Rao & Chatterjee, 2017).¹ However, recent work using

¹A related literature looks at the impact of sibling gender on parent-child occupational transmission, generally finding that brothers block father-daughter transmission of occupational preferences. Oguzoglu and Ozbeklik (2016) finds that brothers decrease the likelihood that females with STEM fathers choose STEM majors, and Mishkin (2017) finds that brothers decrease the probability that daughters of self-employed fathers become self-employed themselves. A larger set of papers also looks at the impact of sibling characteristics on long-run outcomes, regardless of sibling gender. See, for example, Yi, Heckman, Zhang, and Conti (2015); Black et al. (2017); Heissel (2017), among others.

large administrative datasets in Europe suggests that more recent cohorts of women may experience an earnings penalty from brothers (Gielen, Holmes, & Myers, 2016; Brenøe, 2018; Peter, Lundborg, Mikkelsen, & Webbink, 2018).² In fact, these papers seem to indicate a growing earnings penalty from brothers for women over time. Peter et al. (2018) finds that a next-youngest brother reduces female earnings by 0.5 percent for females born from 1938-1977 in Sweden; Gielen et al. (2016) finds that a brother who is close in age reduces female earnings by about 2 percent for women born from 1959-1979 in the Netherlands; and Brenøe (2018) finds that a next-youngest brother reduces female earnings by 2 percent for women born from 1962-1975 in Denmark. Little is known, however, about recent cohorts in the United States. Furthermore, the pathways through which sibling gender affects home environment and labor market outcomes are largely unexplored in the literature.

This paper makes use of a unique longitudinal dataset, the National Longitudinal Study of Adolescent to Adult Health (Add Health), which provides a number of advantages. First, Add Health examines a recent cohort of women (born in the late 1970s and early 1980s) relative to the more frequently used surveys such as the National Longitudinal Survey of Youth 1979 (NLSY79).³ Second, it asks detailed questions about childhood environment, behaviors, expectations, and activities. Third, it also contains follow-up interviews that capture information on work, demographic, and attitudinal variables later in life. This longitudinal structure allows us to examine a wide variety of mechanisms, from parents' activities during adolescence (such as interactions with teachers) to attitudes and behaviors during adulthood. Specifically, we examine parents' expectations and school monitoring using responses from the parent survey. We use information on activities (e.g. parents' presence during dinner) to examine parents' time investment, use information on allowances and financial assistance during young adulthood to explore parents' financial support, and use information on medical visits to explore health investment. We use information on activities with mothers versus fathers and reported attitudes on work

²Recent results from East Asia also suggest an education penalty from brothers. For example, Ono (2004); Chen, Chen, and Liu (2017); Lei, Shen, Smith, and Zhou (2017) find that brothers decrease educational attainment in Japan, Taiwan, and China, respectively.

³The NLSY79 focuses on cohorts born in the early to mid-1960s.

and desired family size to examine gender differentiation. Finally, we use a battery of questions on risky behavior in adolescence to explore whether sibling gender affects the propensity to engage in risky behavior.

Following recent papers in the literature on sibling gender composition (Vogl, 2013; Brenøe, 2018; Peter et al., 2018) we restrict our sample to those with at least one younger sibling and examine the effect of sibling gender composition using the gender of the next-youngest sibling, defined as the next sibling born after the sample respondent (regardless of the birth order of the sample respondent herself). We choose to focus on the gender of the next-youngest sibling because it provides the cleanest identification strategy. The gender of an older sibling may in fact indicate parental gender preferences (if parents make fertility choices based on the gender composition of earlier children). Conditional on deciding to have another child, the gender of that next child should be random. This should hold regardless of whether the additional child is the first, second, or third born (and beyond) in the family.⁴ We control for whether a child is the first born child, second born child, or third (or later) born child in all regressions.

We find that the presence of a next-youngest brother lowers earnings for women in their late 20s and early 30s by approximately 7 percent. Our investigation of the mechanisms behind this effect reveals that the presence of a next-youngest brother lowers parental investment in the form of expectations and schoolwork monitoring for daughters and increases daughters' propensity to engage in traditionally feminine tasks.

Besides contributing to a growing literature on the impact of sibling gender (discussed above), our research contributes to the literature on the earnings gap. As noted by Blau and Kahn (2017), despite gains in relative earnings over the past half-century, women continue to earn less than men on both an annual and weekly basis. A variety of mechanisms have been put forward to explain the earnings gap [see Blau and Kahn (2017) for an overview]. These include factors such as differences in occupation and industry (Blau & Kahn, 2017), differences in time spent on home production (including housework

⁴We provide balance tests supporting the exogeneity of the next-youngest sibling's gender by birth order in Section 3. In Section 6, we also show that our main earnings results are similar when including only first born children in our sample. Results for Tables 3-11 with first born children only are available in the Web Appendix. The evidence remains qualitatively unchanged.

and childcare) (Hersch & Stratton, 1997, 2002), differences in the propensity to work very long hours (Gicheva, 2013; Goldin, 2014; Cortés & Pan, 2016), and discrimination, among others. A recent literature has also examined the role of gender norms, noting that women with more traditional gender norms may strive to earn less than their husbands (Bertrand, Kamenica, & Pan, 2015), and that exposure to more working females in adolescence may lead women to have higher labor force participation when they have children (Olivetti, Patacchini, & Zenou, 2018). By noting pathways through which brothers reduce women’s earnings, we show that exogenous changes to family environments can lead women to receive greater parental expectations and reduce the extent of their family responsibilities relative to other household members, potentially reducing earnings gaps between men and women later in life.

Our analysis proceeds as follows. We first outline the potential theoretical implications of sibling gender on women’s labor market outcomes. We then discuss our primary data source and our identification strategy. Next, we detail our results and examine mechanisms. Finally, we provide extensions to our results and conclude.

2 Theoretical Overview

In this Section, we describe in greater detail the theoretical basis for the impact of sibling gender on long-run outcomes. We first examine the role of sibling gender on household size (parents’ fertility choices) and structure, and then explore parental investment, gender differentiation, and risky behavior.

First, one natural way that sibling gender may influence long-run outcomes is through effects on fertility choices. Parents may have preferences over the gender of their offspring. Since parents may want at least one child of each gender (Angrist & Evans, 1998) or want at least one son (Dahl & Moretti, 2008), the birth of a male sibling to a woman’s parents may lead the parents to stop having children, reducing her overall family size (Angrist & Evans, 1998). Smaller family size may increase the resources allocated to each child (Cáceres-Delpiano, 2006), and research has indicated that smaller families may

improve achievement measures such as educational attainment or test scores (Jaeger, 2008; Booth & Kee, 2009; Åslund & Grönqvist, 2010; Silles, 2010).⁵ Fewer children may also increase the labor force participation of mothers, which may then influence daughters' participation (Angrist & Evans, 1998; Fernández, 2013; Boustan & Collins, 2014; Olivetti et al., 2018). In addition to decreasing overall family size, brothers may affect the structure of households. Morgan, Lye, and Condran (1988), Dahl and Moretti (2008), and Blau et al. (2017) document that parents are more likely to be married if there is a male child; thus, females with brothers may be more likely to live in a two-parent household. Two-parent households have also been tied to a variety of positive outcomes, including improved performance in school (Pong, Dronkers, & Hampden-Thompson, 2003; Steele, Sigle-Rushton, & Kravdal, 2009). Overall, the impacts of a brother on household size and structure should generally be positive for women, because reductions in family size, increases in mothers' labor force participation, and presence in a two-parent household all generally have an insignificant or positive impact on hours and/or earnings (see above).

In addition to influencing fertility choices and family structure, brothers may affect females more directly by influencing parents' and siblings' attitudes and behaviors, which may also affect women's long-run outcomes. Below, we provide theoretical motivation for three key mechanisms through which brothers may directly impact long-run earnings: parental investment, gendered attitudes and behaviors, and disruptive behaviors.

We first consider the impact of sibling gender composition on broadly defined parental investment (including expectations, school monitoring, overall time with children, financial investment, and health care investment). These measures of investment have all been shown to differ across families in developed countries and have been shown to impact long-run earnings.⁶ According to the framework developed by Becker (1991), parents

⁵The effect of brothers through reductions in family size has been labeled the "indirect effect" of brothers, and has been shown to be large and positive in Taiwan (Chen et al., 2017). In contrast, Black, Devereux, and Salvanes (2005) finds little evidence of a causal impact of sibship size on educational attainment or earnings for individuals in Norway when instrumenting for sibship size with twins, and Angrist, Lavy, and Schlosser (2010) finds no impact of sibship size on long-run outcomes in Israel. Black, Devereux, and Salvanes (2010) finds that expected increases in family size do not affect IQ scores for young men in Norway, but unexpected increases in family size decrease IQ scores. However, very few studies to our knowledge indicate that smaller families lead to worse outcomes.

⁶For the influence of parental expectations, see Yamamoto and Holloway (2010), among others. For monitoring, see Wang and Sheikh-Khalil (2014), among others. For parental time and activities, see

choose to maximize the sum of lifetime earnings of their children subject to a resource constraint (time, energy, financial resources, etc.). Thus, parents will invest most in the child with the highest marginal return (or lowest marginal cost). If males have a higher return on investment in the labor market relative to females, parents may invest more resources (money and time) in boys.⁷ Prior to the 1970s, most women worked for short periods of life and had few career opportunities open to them (Blau & Kahn, 2017). As a result, the benefit of investing in the future careers of these women was often lower than the costs, regardless of whether the woman had brothers or sisters. However, in recent years, the earnings potential of women has grown dramatically, so that parents may be more willing to invest in a girl (but still less than in a boy in the presence of constraints).⁸

In addition to affecting parental investment, male siblings may affect gender role views and feminine identity, leading females to specialize in more traditionally feminine tasks and attitudes. A large literature in psychology suggests that siblings strive to “differentiate” themselves from each other, or establish their uniqueness from their siblings [see, e.g., Ansbacher and Ansbacher (1956); Plomin and Daniels (1987); Feinberg and Hetherington (2000)].⁹ This form of sibling differentiation appears to become especially important during adolescence and involves both younger and older siblings trying to differentiate themselves from each other (McHale, Updegraff, Helms-Erikson, & Crouter, 2001). One form of differentiation in mixed-sex environments is gendered behavior and attitudes. The psychology literature has documented that the presence of more members of the opposite gender in a household or group increases the “salience” of one’s own gender (i.e. the importance of gender to overall identity) (McGuire et al., 1979; Cota & Dion, 1986;

Datcher-Loury (1988); Pleck (1997); Zick, Bryant, and Österbacka (2001); Milkie, Nomaguchi, and Denny (2015). For financial investment, see Yeung, Linver, and Brooks-Gunn (2002); Menning (2002). Finally, for health care investment, see Case, Lubotsky, and Paxson (2002) and Datar, Kilburn, and Loughran (2010).

⁷Evidence that parents may invest more in cognitively higher-ability children in the United States is given in Grätz and Torche (2016). For evidence on parental investment in boys relative to girls in India, see Barcellos, Carvalho, and Lleras-Muney (2014). A related literature examines whether parents compensate for or reinforce differences in health endowments between children, with the majority of studies finding that parents reinforce endowment differences [see Almond and Mazumder (2013) for a review of the literature].

⁸In support of this view, studies have shown declining son preference in the United States. Parents before 1980 had more additional children after a firstborn daughter relative to a firstborn son (Dahl & Moretti, 2008), but this son preference has been generally eliminated in recent years (Blau et al., 2017).

⁹This theory is known as sibling deidentification.

Turner et al., 1987; Abrams et al., 1990), which can then lead an individual to engage in behavior more consistent with traditional gender roles and attitudes (Turner, 1982; Cota & Dion, 1986; Favara, 2012; Schneeweis & Zweimüller, 2012; Booth et al., 2013). This gender differentiation may be reinforced if parents of mixed-gender siblings may choose to specialize, with the father spending more time with the son and the mother spending more time with the daughter (Brenøe, 2018). In support of this theory, evidence from sociology indicates that the presence of opposite-gender siblings may lead to the adoption of more traditional sex-typed activities and interests [see Grotevant (1978); Brody and Steelman (1985); McHale et al. (1999)]. The identity framework developed by Akerlof and Kranton (2000) suggests that individuals suffer a utility loss from acting in ways that are in conflict with their perceived identities. Therefore, if a woman raised with brothers develops a stronger traditionally female identity than a woman raised with sisters, she may face a greater cost of acting in traditionally non-feminine ways later in life (e.g., working long hours or in male dominated careers) and may be less likely to do so.

Finally, siblings may influence participation in disruptive behaviors such as criminal activity and substance use. As discussed above, if parents choose to gender specialize, a girl with a brother may spend less time with her father. Since distance from one's father is associated with higher delinquency rates (Bronte-Tinkew, Moore, & Carrano, 2006; Fosco, Stormshak, Dishion, & Winter, 2012), females with brothers may be more likely to engage in substance abuse and/or delinquent behaviors in adolescence, which may in turn affect their health and cognitive development (Volkow, Baler, Compton, & Weiss, 2014), educational outcomes (Bray, Zarkin, Ringwalt, Qi, et al., 2000; Balsa, Giuliano, & French, 2011) and ultimately their labor market outcomes (Ringel, Ellickson, & Collins, 2006). In addition to time spent with father, lower parental expectations and (other) investment as outlined previously may also lead to increases in delinquent behavior.

Below, we use questions on parental expectations, parent-child activities, parental spending, and other factors to examine the importance of these mechanisms in explaining the earnings penalty from brothers.

3 Data and Identification

3.1 Data

The primary data set used in this paper is the National Longitudinal Survey of Adolescent to Adult Health (Add Health).¹⁰ Add Health was designed to study the impact of family, neighborhood, and school environment on adolescents' behavior. In 1994-1995, it collected data from students in grades 7-12 from a nationally representative sample of about 130 private and public schools (Wave I). From the roughly 90,000 students sampled in 1994-1995, a subset of about 20,000 students was selected for a more detailed in-home interview (which included both a student and parent interview). This subsample was again interviewed in 1996 (Wave II), in 2001-2002 (Wave III), and in 2008 (Wave IV). The longitudinal aspect of this data allows us to examine characteristics of the household in adolescence, and employment outcomes and family structure in adulthood.

We use data from Wave I to obtain information about family characteristics of our sample. In Wave I, students are asked to give a detailed household roster listing up to 20 individuals and their relation to the student. We count as brothers those listed as full brothers or half brothers, and count as sisters those listed as full sisters or half sisters. We exclude step siblings and adopted siblings, since the gender of these siblings may be endogenous. As discussed below, our key independent variable is the gender of the next-youngest sibling. Other individual and family characteristics pulled from Wave I include student age (cohort), race, mother's age, parents' education, and parents' immigration status. We also pull information on whether the student lives in a two-parent household, the total number of siblings in the household, mother's working behavior, activities with parents, health care, allowances, disruptive behaviors, parents' expectations, and parents' monitoring of student school performance. We use data from later waves

¹⁰This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

on parents' financial investment over time and on students' family responsibilities and intentions.

Our key dependent variable is log earnings in Wave IV. We include earnings for anyone who reports working at least 10 hours a week in a current or previous job. We exclude those who claim to have worked at least 10 hours per week, but report earnings under \$2000. We also exclude earnings for those in the military or prison.¹¹ We winsorize earnings at the 95th percentile to limit the influence of outliers. We do so by setting earnings above the 95th percentile of log earnings equal to the value for the 95th percentile.

Our final sample includes those with any younger sibling in the household. We exclude those born outside the United States and those who are of Asian descent and have an immigrant parent.¹² Descriptions of our variables and summary statistics for our final sample are presented in Appendix Table A.1. As shown in Table A.1, as of Wave IV, most of the individuals in our sample have a high school degree, and about one-third have a college degree. Over 60 percent of our sample works full time, which is consistent with full time labor force participation rates of women in 2007 (Solis & Hall, 2009).¹³ The average earnings of women in our sample is about \$32,000 per year, and the median earnings is \$28,000. This is consistent with the median weekly earnings for women in 2007 as reported by the Bureau of Labor Statistics (Solis & Hall, 2009).¹⁴

¹¹At a minimum wage of \$5.15 per hour in 2007, \$2000 corresponds to just under 4000 hours per year, or about 40 weeks of work at 10 hours per week. In addition, \$2000 was the minimum earnings amount needed to count as two quarters of work by the Social Security Administration in 2007. See <https://www.ssa.gov/oact/cola/QC.html>

¹²We exclude these groups because there is evidence of sex-selective abortion outside the United States and among Asian American immigrant populations (Almond & Edlund, 2008; Abrevaya, 2009; Sen, 2017), which may interfere with our identification strategy (see Section 3.2).

¹³In particular, roughly 80 percent of those ages 25-34 were in the labor force in 2007. About three-quarters of working women work full time, and thus we estimate that roughly 60 percent of women ages 25-34 work full time. Our measure of any earnings is higher than that in the 80 percent labor force participation reported by Solis and Hall (2009), likely due to our very inclusive definition of employment that allows for any labor force attachment over the previous year (not just attachment in the week of the survey).

¹⁴Specifically, Solis and Hall (2009) reports median weekly earnings of \$597 for those ages 25-34. If we multiply this by 52 weeks, we get earnings of roughly \$31,000 per year, slightly higher than the estimate in our sample.

3.2 Identification

The goal of this paper is to identify the impact of sibling gender on long-run outcomes. A natural approach to answer this question would be to regress long-run earnings on the presence of a brother or total number of brothers in the household. However, as noted by Vogl (2013), Brenøe (2018), Peter et al. (2018), and others, this approach poses identification problems. In particular, the decision to have an additional child is not exogenous, and may depend on the gender composition of previous children. For example, parents with a strong preference for sons may continue having children until the birth of a son. In this family, the presence of a brother would not be exogenous, but would be correlated with family characteristics.

Following a growing literature [see, e.g., Vogl (2013); Brenøe (2018); Peter et al. (2018)], we focus our analysis on the gender of the next-youngest sibling. The idea is that, conditional on the decision to have another child, the gender of that child is random.¹⁵ Focusing on just the next-youngest sibling allows us to obtain a causal estimate of the impact of having an additional male (relative to female) sibling. Since a younger brother may decrease family size (and thus positively impact earnings), our estimated effect may in fact be a lower bound for the estimate of a next-youngest brother conditional on family size.

To examine our identification strategy, in Table 1 we present summary statistics of individual and family characteristics for those with a next-youngest brother versus next-youngest sister for the entire sample [panel (a)] and distinguishing by birth order [panels (b)-(d)]. Evidence showing that individual and parent characteristics that are determined prior to birth are the same across groups supports the assumption that sibling gender is distributed randomly. At the bottom of each subtable, we also examine the relationship between the next-youngest sibling's gender and family size, which we do not expect to be balanced across the gender of the next-youngest sibling, as noted in Section 2. As expected, family size is larger for those with younger sisters, due to parental preferences

¹⁵This is true absent widespread sex-selective abortion. There is little evidence of sex-selective abortion among the population born in the United States, with the exception of descendants of Asian immigrants (who are excluded from the sample) (Almond & Edlund, 2008; Abrevaya, 2009).

for sons and/or preferences for at least one child of each gender. Perhaps interestingly, this effect is only significant for first born children. Among the other characteristics, there are few differences between those with a next-youngest brother and next-youngest sister that are statistically significant. Among first born girls, those with a younger sister are slightly older than those with a younger brother. Among second born children, those with a younger sister are slightly less likely to have parents that have completed high school than those with a younger brother. Among the over 30 outcomes studied, only 3 are significant at the 10 percent level and none is significant at the 5 percent level. This is lower than what would be expected by chance, and therefore supports our assumption that the gender of the next-youngest sibling is distributed randomly.

In the sections below, our main independent variable is a dummy that equals 1 if the next-youngest sibling is male (and 0 if she is female).

4 Results

Table 2 presents ordinary least squares (OLS) regressions for females in which the dependent variable is the log of earnings in adulthood, and the key independent variable is an indicator for whether the next-youngest sibling is male. Column (1) includes only controls for student age, student race, birth order, mother's age, and parents' immigration status, column (2) adds controls for mother's education, and column (3) adds controls for father's education. This table shows that the presence of a next-youngest brother decreases female earnings by about 7 percent relative to a sister. We perform similar regressions for males, and display the results in Web Appendix Table A.1.1. For males, the presence of a next-youngest brother shows a positive association with earnings, although the effects do not retain statistical significance once we add controls for parental education. Given the strength of our results for females, we focus on investigation of the mechanisms underlying the penalty for women.

Because our dependent variable is log earnings, women with no earnings are excluded from the regressions in Table 2. To test whether selection into employment is an issue,

we develop a measure “any earnings”. Our measure of “any earnings” is equal to 1 if the individual had any personal income (over \$2000) in the prior year. We run a linear probability model in which the dependent variable is 1 if the individual has earnings in the prior year (and is 0 otherwise). The results are shown in Table 3, column (1). There is no significant impact of the next-youngest sibling’s gender on employment (that is, on selection into our earnings sample), providing confidence that our results are not driven by differential selection into paid employment. We next examine the intensive margin of employment. We create a measure of the log hours worked for individuals who report working at least 10 hours per week in the current or most recent job. Table 3, column (2), shows the relationship between a next-youngest brother and log hours worked. The results indicate that a next-youngest brother decreases weekly hours by about 4 percent.¹⁶

Differences in income may be a result of differences in educational attainment and occupational choice, or differences within educational groups or occupational categories. In Table 3, columns (3)-(5) we examine the impact of a next-youngest brother on educational and occupational outcomes. In column (3), the dependent variable is equal to 1 if the individual has graduated from college. We find no significant difference in college graduation rates by the gender of the next-youngest sibling. Even though the majority of our sample consists of first born females, we do find evidence that those of higher birth order are more likely to be employed and are more likely to complete college, consistent with Black et al. (2005) and others.

In Column (4), the dependent variable is the Nakao-Treas Prestige Score for the individual’s reported occupation [obtained from Ruggles et al. (2016)].¹⁷ We find no significant effect of sibling gender on occupational prestige. In Column (5), the dependent variable is the 1990 occupational earnings score from Ruggles et al. (2016).¹⁸ We again find

¹⁶We cannot construct an accurate measure of hourly earnings, since hours are calculated from the question “How many hours a week (do/did) you usually work at this job?”, answered for the current or most recent job. Earnings are based on total personal earnings in the prior year, and thus the two may not be consistent if the individual changed jobs or changed hours over the past year.

¹⁷In 1989, the General Social Survey asked respondents to rank 110 occupations by social standing on a scale of 1 (low) to 9 (high). The Nakao-Treas Prestige Score converts these average responses into a ranking for each occupation of the 1980 Census from 0 to 100, and women in our sample have occupations ranking from 17 to 86. See Nakao and Treas (1994) for details on the methodology.

¹⁸The occupational earnings score takes the median earnings in a given occupation in the 1990 Census, standardizes it, and then converts it to a percentile, and women in our sample have occupations ranking

no significant impact of the next-youngest sibling's gender on the self-reported occupation's median earnings.

We view decisions about hours, education, and occupation as part of the larger set of work-related outcomes. These factors jointly determine earnings and are likely influenced by the same mechanisms. As a result, in our examination of mechanisms below, we use regressions without hours, education, or occupation controls. This allows us to examine the impact of these mechanisms on earnings in totality rather than focusing on whether these differences come through education, occupation, hours, or earnings within group.

5 Mechanisms

We now consider the mechanisms through which the presence of a brother may affect women's earnings.

5.1 Fertility Choices and Family Structure

As noted above, the presence of an additional brother may affect women by changing family size and structure. In Table 4, we examine whether the gender of the next-youngest sibling is related to the total number of siblings in the household [column (1)], the probability of being in a two-parent household [column (2)], and the probability that the mother works outside the home [column (3)]. Consistent with the literature, we find that sibling gender diversity is associated with smaller families: having a next-youngest brother reduces the number of siblings by 0.1. However, as discussed in Section 2, the literature suggests that, if anything, smaller family size should be beneficial for long-run outcomes. The estimates on mother working and two-parent household are not statistically significant.

from 7 to 100. See <https://usa.ipums.org/usa-action/variables> for more details.

5.2 Parental Investment

We separate our analysis of parental investment into four categories: school monitoring and expectations, time investment, financial investment, and health care investment. We separate these forms of investment because they reflect very different pathways through which parents may invest in children.

First, we consider whether sibling gender affects **school-specific monitoring or expectations** of a child. To measure this form of investment, we use three questions asked of parents in Wave I. The three questions are: “Have you talked with any of NAME’s teachers about (his/her) school work this school year, either informally or in a regularly scheduled parent-teacher conference?” (answers are 0=no or 1=yes), labeled “Talked with Child’s Teachers”; “In the past week, have you and NAME talked about (his/her) school work or grades?” (answers are 0=no or 1=yes), labeled “Talked with Child about School or Grades”; and “How disappointed would you be if NAME did not graduate from college?” (answers range from 1=Not Disappointed to 3=Very Disappointed, and transformed by us into a dummy of 0=Not Disappointed or Somewhat Disappointed and 1=Very Disappointed), labeled “Disappointed if Child not Grad Coll”. In Table 5, we examine whether these measures of school monitoring/expectations vary by the gender of the next-youngest sibling. As shown in the table, the presence of a next-youngest brother reduces parents’ monitoring and expectations for female students’ academic achievement across all three categories. Interestingly, there also appears to be a positive association between high parental expectations and being the first born child.

We next consider **parents’ general time investment**, which we measure by the frequency of parent-child activities. The Wave I survey asks students whether they engaged in a variety of activities with their parents over the past four weeks. We create variables for each of these activities that equal 2 if the student has engaged in the activity with both the mother and the father over the past four weeks, 1 if she has engaged in the activity with one parent, and 0 otherwise. The questions are: “Have you gone to a movie, play, museum, concert, or sports event?”, labeled “Event”; “Have you played a sport?”, labeled “Sports”; “Have you gone shopping?”, labeled “Shopping”; and “Have you talked

about someone you're dating, or a party you went to?" or "Have you had a talk about a personal problem you were having?", labeled "Conversation".¹⁹ Finally, we also use the frequency of parents and children eating meals together to measure parental time investment. We use the Wave I question: "On how many of the past 7 days was at least one of your parents in the room with you while you ate your evening meal?" (answers range from 0=None to 7=All), labeled "Meal Days". To test for differences in parental time investment by sibling gender, we present regressions for each of the parent-child activities in Table 6. The results in columns (1)-(5) indicate that a next-youngest brother (relative to a sister) generally has a statistically insignificant impact on time investment by parents as measured by parent-child activities. Thus, this evidence does not point towards differences in parental time investment by sibling gender.

We next consider parents' **financial investment**. We use two variables in Add Health to measure parents' financial investment. First, we use the Wave I question, "How much is your allowance each week? If you don't receive your allowance weekly, how much would it be each week?" (answers range from \$0 to \$95). We create a dummy variable for whether or not the student received an allowance based on the answer to this question, which is labeled "Received Allowance during Adolescence". Next, we use two questions from Wave III to estimate financial help in adulthood. The first question is: "Has HE/SHE [MOTHER/FATHER] given you any money or paid for anything significant for you during the past 12 months? Don't include regular birthday or holiday gifts" (answers are 0=no or 1=yes). The second question is: "Please give an estimate of this financial help in the past 12 months. Include money given directly to you and the cost of significant items bought for you by [MOTHER/FATHER]" (answers range from 1=less than \$200 to 4=\$1000 or more). We create a dummy variable equal to 1 if either parent has given financial help of \$1000 or more, and 0 otherwise, which is labeled "Parent Helped Financially during Adulthood". In Table 7, we examine whether parents' financial investment varies by the gender of the next-youngest sibling. The results in Table 7 indicate that parents' financial

¹⁹These last two questions are combined into an indicator for "Conversation", which takes a value of 2 if the student has done either activity with both parents, 1 if she has done either activity with one parent, and 0 otherwise.

investment as measured by our two variables does not vary significantly by the gender of the next-youngest sibling. Thus, Table 7 provides suggestive evidence that financial investment differences may not strongly contribute to the earnings penalty from brothers.

Finally, we examine our last measure of parents' investment: **health care investment**. To measure this, we use three questions from Wave I about medical care over the prior year: "In the past year, have you had a routine physical examination?" (answers are 0=no or 1=yes). We create a dummy variable that equals 1 if an individual had a physical in the last year, labeled "Routine Physical." Next, we use the question: "When did you last have a dental examination by a dentist or hygienist?" (answers range from 1=less than a year ago to 4=never), and create a dummy equal to 1 if the individual had a dental examination less than a year ago, labeled "routine dental." Finally we use the question, "Has there been any time over the past year when you thought you should get medical care, but you did not?" (answers are 0=no 1=yes). We create a dummy equal to 1 if the individual always received medical care when needed, labeled "Medical Care Received".²⁰ In Table 8, we examine whether health care investment varies by sibling gender. As shown in columns (1)-(3), we find no significant evidence of a difference in these basic items for health care. We again interpret this as suggestive evidence that differences in health care investment do not drive our results.²¹

Overall, our results on parental investment provide suggestive evidence that parents display less interest in students' academic performance and lower expectations for academic performance in the presence of a younger brother. We do not find evidence of other parental investment mechanisms we test at work. However, our measures (particularly those of financial and health care investment) are limited, and it is possible that there are differences in forms of parental investment we cannot observe.

²⁰Although Add Health has extensive information on specific medical conditions, we do not use this information because parents' investment could affect the likelihood of being diagnosed as well as the likelihood of developing a condition.

²¹Since medical care may be more constrained in lower income families, we also test whether health care investment varies by the gender of the next-youngest child for the subsample of low-income families only (those reporting family income at or below \$37,000 per year in 1994, the median of the sample). Even in this subsample, we find no evidence that health care investment varies significantly by the gender of the next-youngest sibling. Results are available in the Web Appendix.

5.3 Gender Specialization

As highlighted in Section 2 above, siblings may increase specialization in traditionally sex-typed activities and interests. This may come from siblings' own desire to differentiate themselves, or from gendered parenting (i.e. girls with brothers spend more time with mothers relative to fathers, leading them to develop more traditionally feminine interests). While Add Health does not ask detailed questions about preferences for many gender-specific tasks (such as housework) in adolescence, one can gain insight into gender specialization by looking at the time spent with the same-gender versus opposite-gender parent. To examine time with same versus opposite-gender parent, we use the questions about activities with parents from Table 6 (parental time investment) described above. We sum up the total activities done with mother and the total activities done with father [from those used in columns (1)-(4) of Table 6]. We create a variable equal to total number of activities with mother, and one for the total number of activities with father (each ranging from 0 to 4).

We further explore gender specialization by using questions on attitudes toward family/household tasks during Wave IV. Specifically, we use the following questions: “(In the past 12 months/Since you started your current job/In the last year of your most recent job), how often on your primary job (have you had/did you have) to cut back your hours or turn down overtime because of your family responsibilities?” [answers range from 1=frequently or sometimes to 4=never]. We create a dummy variable equal to 1 if the answer to this question is “frequently or sometimes” (and 0 otherwise), and the variable is labeled “Family Interruptions to Work.” To further examine traditional gender attitudes, we also use a question on total number of children intended: “Including any children you may already have, how many children, in total, do you intend to have?” (answers range from 0 to 9). We use the answer to this question as the variable “Number of Children Intended”.

Table 9 examines whether gender specialization (as measured by these variables) is associated with the gender of the next-youngest sibling. As shown in column (1), total activities with mother is positively and significantly affected by a next-youngest brother;

total activities with father [column (2)] is not significantly impacted. The results in column (4) also indicate that those with a next-youngest brothers display greater orientation toward traditionally feminine activities and tasks as indicated by preferences for children.

5.4 Disruptive Behavior

The final mechanism we consider is that of disruptive behavior (i.e. delinquency and substance use). Add Health asks numerous questions about adolescents' risky behavior. For each behavior listed in the questions below, we create a dummy variable equal to 1 if the individual has ever engaged in the behavior (and 0 otherwise). We use the following questions: "Since school started this year/During the 1994-1995 school year, how often have you had trouble getting along with your teachers?" (answers range from 0=never to 4=everyday), labeled "Trouble with Teachers"; "Do you ever drink beer, wine, or liquor when you are not with your parents or other adults in your family?" (answers are 1=yes and 0=no), labeled "Alcohol"; "Have you ever tried cigarette smoking, even just 1 or 2 puffs?" (answers are 1=yes and 0=no); "During your life, how many times have you used marijuana?" (answers range from 0 to 950), labeled "Marijuana". The Add Health survey also contains questions pertaining to criminal activity, ranging from petty crimes to serious offenses. We use the following questions about property damage or graffiti: "In the past 12 months, how often did you deliberately damage property that didn't belong to you?" (answers range from 0=never to 3=5 or more times); and "In the past 12 months, how often did you paint graffiti or signs on someone else's property or in a public place?" (answers range from 0=never to 3=5 or more times). We create a dummy variable equal to 1 if the individual has engaged in either behavior, labeled "Damage or Graffiti." We also use two questions about theft: "In the past 12 months, how often did you steal something worth more than \$50?" (answers range from 0=never to 3=5 or more times); and "How often did you steal something worth less than \$50?" (answers range from 0=never to 3=5 or more times). We create a dummy variable equal to 1 if the individual reports stealing any item (regardless of price), labeled "Steal".

In Table 10, we test whether these behaviors are related to the gender of the next-

youngest sibling. We find suggestive evidence that the presence of younger brothers may be associated with more disruptive behavior. The coefficients on marijuana use, alcohol use, and trouble with teachers are significant and positive. This suggests there is a positive impact of having a younger brother on disruptive behavior (as measured by these questions).

5.5 Testing the Mechanisms

We now test the relative strength of the mechanisms in explaining the earnings penalty from brothers.

To reduce the dimensionality of the data for each of the mechanisms described above, we use principal component analysis (PCA) to create indexes of expectations, school monitoring, time investment, financial investment, health care investment, gender specialization, and disruptive behavior.²² Details on the composition of each of the indexes can be found in the Web Appendix.

We test the strength of the various mechanisms by adding them one at a time into our main earnings regression. Table 11 displays the results. We begin in column (1) by repeating our main regression [column (3) of Table 2] for the subsample of individuals with non-missing information on the variables used to construct our indexes of mechanisms. In columns (2)-(8), we then add our indexes to the regression one at a time. Table 11 shows that parental expectations and gender specialization appear to explain the largest portion of the earnings penalty. When adding the different indexes jointly in a horse race [column (9)], the expectations and gender specialization mechanisms appear most potent.²³ Taken as a whole, our evidence seems to indicate that brothers may primarily reduce women's earnings by lowering investment in the form of expectations and encouraging greater

²²PCA is an orthogonal transformation that converts a set of correlated variables into a fewer number of orthogonal variables (each called a principal component). The first principal components, our indexes, account for the most variance in the data. Because we do not have multiple measures of parental expectations, we use just the variable displayed in column (3) of Table 5 as our measure of parental expectations.

²³To investigate whether these results are driven by multicollinearity, we examine the correlation between our indexes. Of the seven indexes, the largest positive correlation between any two given indexes is 0.22 (correlation between time and financial investments), and the greatest negative correlation is -0.24 (correlation between time investment and disruptive behavior). This suggests that our results are not due to multicollinearity. Results are available in the Web Appendix.

gender specialization.

6 Additional Evidence

In this Section, we extend our evidence as follows. We first examine results when focusing on the sample of first born children only. We then consider as our main explanatory variable the total number of brothers in the household, rather than just the next-youngest brother. Finally, we discuss the results obtained when using an even more recent cohort of women in the National Longitudinal Study of Youth 1979 Child and Young Adult (NLSY-CYA) data.

As noted above, to achieve identification, we focus our analysis on the gender of the next-youngest sibling. There are two potential downsides to using this independent variable. First, women from larger families are more likely to be in our sample (because they are more likely to have a younger sibling). Second, our estimate is only for a next-youngest brother, and an older brother or second-youngest brother may affect women differently than a next-youngest brother. We perform two sets of regressions to address these concerns. First, we address the concern that individuals from larger families are more likely to be in our sample. To show that our results hold when we pull equally from all families with at least 2 children, we perform regressions restricting our sample to first born children with at least one younger sibling. In Table 12, we repeat Table 2 for the sample of female oldest children. As shown in columns (1)-(3), a next-youngest brother continues to exert a negative impact on women's earnings. The magnitude of the estimate is larger, but the standard errors are also larger (likely due to a decrease in sample size).²⁴

Second, we examine the associations between having any additional brother in the household and earnings. The identification strategy used in this paper only allows us to obtain a causal effect of having a younger brother versus a younger sister. However, the literature indicates that both older and younger siblings influence each other's behaviors

²⁴In Web Appendix Table A.1.4, we test for the presence of heterogeneity of results by birth order. We interact the dummies for first born, second born, and third born and higher with the dummy for whether the next-youngest sibling is a brother. We then test whether these interactions are statistically different from each other with F-tests for the equality of coefficients. As shown at the base of the table, we do not find evidence of significant differences of the effect of a next-youngest brother by birth order.

and attitudes (Whiteman & Christiansen, 2008; Whiteman, Becerra, & Killoren, 2009; Whiteman, Jensen, & McHale, 2017).²⁵ We repeat our main regressions using as the independent variable the total number of brothers in the household. This allows our sample to include those without any younger siblings. The results are shown in Table 13.²⁶ They indicate that an additional brother is associated with an earnings decline of roughly 8 percent. Although this regression cannot fully account for the endogeneity of fertility choices, it provides suggestive evidence that any additional brother, not just a next-youngest brother, may lower earnings.

Finally, we also examine the effect of the next-youngest brother in the NLSY-CYA survey, which includes women mostly born in the 1980s and 1990s. Although the sample size is small, we find a qualitatively similar estimate of the effect of the next-youngest brother on earnings which is higher in magnitude than our results in Table 2.²⁷

7 Conclusion

This paper provides the first estimates of the impact of sibling gender composition on women’s earnings for recent U.S. cohorts and provides a first step at examining the mechanisms through which this effect may occur. In particular, we find that the presence of a next-youngest brother lowers earnings by approximately 7 percent for a woman in her late 20s or early 30s. The magnitude of our results for both men and women is somewhat larger than the ones obtained in studies using data from northern Europe, which have indicated that brothers decrease women’s earnings by about 2 percent. However, the United States as a whole displays greater earnings dispersion than European countries,

²⁵The literature indicates that, while older siblings may be more influential in childhood and early adolescence when they have greater responsibilities and ability than their younger siblings, sibling relationships become more egalitarian and younger siblings become more likely to influence older siblings in adolescence (Buhrmester & Furman, 1990; Buhrmester, 1992).

²⁶In these regressions, we do not control for total number of siblings since fertility choices may be endogenous (see Section 2). However, the magnitude and significance of our results is unchanged if we control for the total number of siblings.

²⁷We also examine the earlier cohort represented in the NLSY79. Consistent with earlier work, we find no impact of sibling gender composition on earnings for women in this survey. However, we do find that women with a next-youngest brother (or any additional brother) are significantly less likely to be in the labor force (by about 3-5 percentage points) in most survey years between 1986 and 2012. We suspect that the mechanisms may be operating along the extensive margin for these earlier cohorts (born before 1970). Results using both the NLSY79 and NLSY-CYA data are available upon request.

and we examine more recent cohorts, where a greater fraction of women may be working.

The unique contribution of this paper is to provide a first investigation of the mechanisms that may underly the effect of sibling gender on earnings. We find evidence that females experience lower parental expectations and adopt more traditional attitudes and behaviors toward gender in the presence of brothers. Our results help advance the literature on the continuing earnings gap between men and women, suggesting that both parents' attitudes toward their children and gendered behavior/family responsibilities are important in shaping women's earnings. Future research could explore in more detail the interplay between interactions with parents and direct interactions with siblings in adolescence (akin to peer effects) in shaping choices later on in life.

8 References

- Abrams, D., Thomas, J., & Hogg, M. A. (1990). Numerical distinctiveness, social identity and gender salience. *British Journal of Social Psychology*, 29(1), 87–92.
- Abrevaya, J. (2009). Are there missing girls in the United States? Evidence from birth data. *American Economic Journal: Applied Economics*, 1(2), 1–34.
- Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, 115(3), 715–753.
- Almond, D., & Edlund, L. (2008). Son-biased sex ratios in the 2000 United States Census. *Proceedings of the National Academy of Sciences*, 105(15), 5681–5682.
- Almond, D., & Mazumder, B. (2013). Fetal origins and parental responses. *Annu. Rev. Econ.*, 5(1), 37–56.
- Anelli, M., & Peri, G. (2015). Gender of Siblings and Choice of College Major. *CESifo Economic Studies*, 61(1), 53–71.
- Angrist, J. D., & Evans, W. N. (1998). Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size. *The American Economic Review*, 88(3), 450–477.
- Angrist, J. D., Lavy, V., & Schlosser, A. (2010). Multiple experiments for the causal link between the quantity and quality of children. *Journal of Labor Economics*, 28(4), 773–824.
- Ansbacher, H. L., & Ansbacher, R. R. (1956). *The individual psychology of Alfred Adler*. New York: Harper Colophon Books.
- Åslund, O., & Grönqvist, H. (2010). Family size and child outcomes: Is there really no trade-off? *Labour Economics*, 17(1), 130–139.
- Balsa, A. I., Giuliano, L. M., & French, M. T. (2011). The effects of alcohol use on academic achievement in high school. *Economics of education review*, 30(1), 1–15.
- Barcellos, S. H., Carvalho, L. S., & Lleras-Muney, A. (2014). Child Gender and Parental Investments in India: Are Boys and Girls Treated Differently? *American Economic Journal: Applied Economics*, 6(1), 157–189.
- Becker, G. S. (1991). *A Treatise on the Family*, enl. ed. Cambridge, Mass: Harvard.

- Bertrand, M., Kamenica, E., & Pan, J. (2015). Gender Identity and Relative Income within Households. *The Quarterly Journal of Economics*, 130(2), 571–614.
- Black, S. E., Breining, S., Figlio, D. N., Guryan, J., Karbownik, K., Nielsen, H. S., ... Simonsen, M. (2017). Sibling Spillovers. NBER Working Paper 23062.
- Black, S. E., Devereux, P. J., & Salvanes, K. G. (2005). The More the Merrier? The Effect of Family Size and Birth Order on Children's Education. *The Quarterly Journal of Economics*, 120(2), 669–700.
- Black, S. E., Devereux, P. J., & Salvanes, K. G. (2010). Small family, smart family? Family size and the IQ scores of young men. *Journal of Human Resources*, 45(1), 33–58.
- Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, 55(3), 789–865.
- Blau, F. D., Kahn, L. M., Brummund, P., Cook, J., & Larson-Koester, M. (2017). Is there Still Son Preference in the United States? NBER Working Paper 23816.
- Booth, A., Cardona, L., & Nolen, P. (2013). Do single-sex classes affect exam scores? an experiment in a coeducational university.
- Booth, A., & Kee, H. J. (2009). Birth order matters: the effect of family size and birth order on educational attainment. *Journal of Population Economics*, 22(2), 367–397.
- Boustan, L. P., & Collins, W. J. (2014). The Origin and Persistence of Black-White Differences in Women's Labor Force Participation. In *Human capital in history: The American record* (pp. 205–240). University of Chicago Press.
- Bray, J. W., Zarkin, G. A., Ringwalt, C., Qi, J., et al. (2000). The relationship between marijuana initiation and dropping out of high school. *Health Economics*, 9(1), 9–18.
- Brenøe, A. A. (2018). Origins of Gender Norms: Sibling Gender Composition and Women's Choice of Occupation and Partner. University of Zurich Department of Economics Working Paper No. 294.
- Brody, C. J., & Steelman, L. C. (1985). Sibling Structure and Parental Sex-typing of

- Children's Household Tasks. *Journal of Marriage and the Family*, 265–273.
- Bronte-Tinkew, J., Moore, K. A., & Carrano, J. (2006). The father-child relationship, parenting styles, and adolescent risk behaviors in intact families. *Journal of Family Issues*, 27(6), 850–881.
- Buhrmester, D. (1992). The developmental courses of sibling and peer relationships. *Children's sibling relationships: Developmental and clinical issues*, 19–40.
- Buhrmester, D., & Furman, W. (1990). Perceptions of sibling relationships during middle childhood and adolescence. *Child development*, 61(5), 1387–1398.
- Butcher, K. F., & Case, A. (1994). The Effect of Sibling Sex Composition on Women's Education and Earnings. *The Quarterly Journal of Economics*, 109(3), 531–563.
- Cáceres-Delpiano, J. (2006). The impacts of family size on investment in child quality. *Journal of Human Resources*, 41(4), 738–754.
- Case, A., Lubotsky, D., & Paxson, C. (2002). Economic status and health in childhood: The origins of the gradient. *American Economic Review*, 92(5), 1308–1334.
- Chen, S. H., Chen, Y.-C., & Liu, J.-T. (2017). The Impact of Family Composition on Educational Achievement. *Forthcoming in Journal of Human Resources*.
- Conley, D. (2000). Sibship sex composition: Effects on educational attainment. *Social Science Research*, 29(3), 441–457.
- Cortés, P., & Pan, J. (2016). When Time Binds: Returns to Working Long Hours and the Gender Wage Gap among the Highly Skilled.
- Cota, A. A., & Dion, K. L. (1986). Salience of gender and sex composition of ad hoc groups: An experimental test of distinctiveness theory. *Journal of Personality and Social Psychology*, 50(4), 770.
- Dahl, G. B., & Moretti, E. (2008). The Demand for Sons. *The Review of Economic Studies*, 75(4), 1085–1120.
- Datar, A., Kilburn, M. R., & Loughran, D. S. (2010). Endowments and parental investments in infancy and early childhood. *Demography*, 47(1), 145–162.
- Datcher-Loury, L. (1988). Effects of mother's home time on children's schooling. *The review of economics and statistics*, 367–373.

- Favara, M. (2012). The Cost of Acting “Girly”: Gender Stereotypes and Educational Choices. Working Paper.
- Feinberg, M. E., & Hetherington, E. M. (2000). Sibling differentiation in adolescence: Implications for behavioral genetic theory. *Child Development*, *71*(6), 1512–1524.
- Fernández, R. (2013). Cultural change as learning: The evolution of female labor force participation over a century. *American Economic Review*, *103*(1), 472–500.
- Fosco, G. M., Stormshak, E. A., Dishion, T. J., & Winter, C. E. (2012). Family relationships and parental monitoring during middle school as predictors of early adolescent problem behavior. *Journal of Clinical Child & Adolescent Psychology*, *41*(2), 202–213.
- Gicheva, D. (2013). Working long hours and early career outcomes in the high-end labor market. *Journal of Labor Economics*, *31*(4), 785–824.
- Gielen, A. C., Holmes, J., & Myers, C. (2016). Prenatal Testosterone and the Earnings of Men and Women. *Journal of Human Resources*, *51*(1), 30–61.
- Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, *104*(4), 1091–1119.
- Grätz, M., & Torche, F. (2016). Compensation or reinforcement? The stratification of parental responses to childrens early ability. *Demography*, *53*(6), 1883–1904.
- Grotevant, H. D. (1978). Sibling Constellations and Sex Typing of Interests in Adolescence. *Child Development*, 540–542.
- Hauser, R. M., & Kuo, H.-H. D. (1998). Does the Gender Composition of Sibships Affect Women’s Educational Attainment? *Journal of Human Resources*, 644–657.
- Heissel, J. A. (2017). Teenage Motherhood and Sibling Outcomes. *American Economic Review*, *107*(5), 633–37.
- Hersch, J., & Stratton, L. S. (1997). Housework, fixed effects, and wages of married workers. *Journal of Human Resources*, 285–307.
- Hersch, J., & Stratton, L. S. (2002). Housework and wages. *Journal of Human resources*, 217–229.
- Jaeger, M. M. (2008). Do large sibships really lead to lower educational attainment?

- New evidence from quasi-experimental variation in couples' reproductive capacity. *Acta Sociologica*, 51(3), 217–235.
- Kaestner, R. (1997). Are Brothers Really Better? Sibling Sex Composition and Educational Achievement Revisited. *Journal of Human Resources*, 32(2).
- Lei, X., Shen, Y., Smith, J. P., & Zhou, G. (2017). Sibling gender compositions effect on education: evidence from China. *Journal of population economics*, 30(2), 569–590.
- McGuire, W. J., McGuire, C. V., & Winton, W. (1979). Effects of household sex composition on the salience of one's gender in the spontaneous self-concept. *Journal of Experimental Social Psychology*, 15(1), 77–90.
- McHale, S. M., Crouter, A. C., & Tucker, C. J. (1999). Family Context and Gender Role Socialization in Middle Childhood: Comparing Girls to Boys and Sisters to Brothers. *Child Development*, 70(4), 990–1004.
- McHale, S. M., Updegraff, K. A., Helms-Erikson, H., & Crouter, A. C. (2001). Sibling influences on gender development in middle childhood and early adolescence: A longitudinal study. *Developmental Psychology*, 37(1), 115.
- Menning, C. L. (2002). Absent parents are more than money: The joint effect of activities and financial support on youths' educational attainment. *Journal of Family Issues*, 23(5), 648–671.
- Milkie, M. A., Nomaguchi, K. M., & Denny, K. E. (2015). Does the amount of time mothers spend with children or adolescents matter? *Journal of Marriage and Family*, 77(2), 355–372.
- Mishkin, E. (2017). Gender and Sibling Dynamics in the Intergenerational Transmission of Entrepreneurship.
- Morgan, S. P., Lye, D. N., & Condran, G. A. (1988). Sons, daughters, and the risk of marital disruption. *American journal of sociology*, 94(1), 110–129.
- Oguzoglu, U., & Ozbeklik, S. (2016). Like Father, Like Daughter (Unless There Is a Son): Sibling Sex Composition and Women's STEM Major Choice in College. IZA Discussion Paper 10052.
- Olivetti, C., Patacchini, E., & Zenou, Y. (2018). Mothers, Peers and Gender-Role

- Identity. *Forthcoming in Journal of the European Economic Association*.
- Ono, H. (2004). Are Sons and Daughters Substitutable?: Allocation of Family Resources in Contemporary Japan. *Journal of the Japanese and International Economies*, 18(2), 143–160.
- Peter, N., Lundborg, P., Mikkelsen, S., & Webbink, D. (2018). The effect of a siblings gender on earnings and family formation. *Labour Economics*, 54, 61–78.
- Pleck, J. H. (1997). Paternal involvement: Levels, sources, and consequences.
- Plomin, R., & Daniels, D. (1987). Why are children in the same family so different from one another? *Behavioral and Brain Sciences*, 10(1), 1–16.
- Pong, S.-l., Dronkers, J., & Hampden-Thompson, G. (2003). Family policies and children’s school achievement in single-versus two-parent families. *Journal of marriage and family*, 65(3), 681–699.
- Powell, B., & Steelman, L. C. (1990). Beyond sibship size: Sibling density, sex composition, and educational outcomes. *Social Forces*, 69(1), 181–206.
- Rao, N., & Chatterjee, T. (2017). Sibling Gender and Wage Differences. *Applied Economics*, 1–21.
- Ringel, J. S., Ellickson, P. L., & Collins, R. L. (2006). The relationship between high school marijuana use and annual earnings among young adult males. *Contemporary Economic Policy*, 24(1), 52–63.
- Schneeweis, N., & Zweimüller, M. (2012). Girls, girls, girls: Gender composition and female school choice. *Economics of Education review*, 31(4), 482–500.
- Sen, A. (2017). More than 100 million women are missing. In *Gender and rights* (pp. 81–84). Routledge.
- Silles, M. A. (2010). The implications of family size and birth order for test scores and behavioral development. *Economics of Education Review*, 29(5), 795–803.
- Solis, H. L., & Hall, K. (2009). Women in the labor force: A databook. *US Bureau of Labor Statistics. Report, 1018*, 1–98.
- Steele, F., Sigle-Rushton, W., & Kravdal, Ø. (2009). Consequences of family disruption on childrens educational outcomes in Norway. *Demography*, 46(3), 553–574.

- Turner, J. C. (1982). Towards a cognitive redefinition of the social group. *Social identity and intergroup relations*, 15–40.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Basil Blackwell.
- Vogl, T. S. (2013). Marriage Institutions and Sibling Competition: Evidence from South Asia. *The Quarterly Journal of Economics*, 128(3), 1017–1072.
- Volkow, N. D., Baler, R. D., Compton, W. M., & Weiss, S. R. (2014). Adverse health effects of marijuana use. *New England Journal of Medicine*, 370(23), 2219–2227.
- Wang, M., & Sheikh-Khalil, S. (2014). Does parental involvement matter for student achievement and mental health in high school? *Child Development*, 85(2), 610–625.
- Whiteman, S. D., Becerra, J. M., & Killoren, S. E. (2009). Mechanisms of sibling socialization in normative family development. *New directions for child and adolescent development*, 2009(126), 29–43.
- Whiteman, S. D., & Christiansen, A. (2008). Processes of sibling influence in adolescence: Individual and family correlates. *Family Relations*, 57(1), 24–34.
- Whiteman, S. D., Jensen, A. C., & McHale, S. M. (2017). Sibling influences on risky behaviors from adolescence to young adulthood: Vertical socialization or bidirectional effects? *New directions for child and adolescent development*, 2017(156), 67–85.
- Yamamoto, Y., & Holloway, S. D. (2010). Parental expectations and children’s academic performance in sociocultural context. *Educational Psychology Review*, 22(3), 189–214.
- Yeung, W. J., Linver, M. R., & Brooks-Gunn, J. (2002). How money matters for young children’s development: Parental investment and family processes. *Child development*, 73(6), 1861–1879.
- Yi, J., Heckman, J. J., Zhang, J., & Conti, G. (2015). Early Health Shocks, Intra-household Resource Allocation and Child Outcomes. *The Economic Journal*, 125(588), F347–F371.

Zick, C. D., Bryant, W. K., & Österbacka, E. (2001). Mothers' employment, parental involvement, and the implications for intermediate child outcomes. *Social Science Research*, 30(1), 25–49.

9 Tables and Figures

Table 1: Balance Tests

(a) All Females

	(1)	(2)	(3)	(4)
	Next-Youngest Brother	Next-Youngest Sister	<i>T-Stat</i>	<i>P-Value</i>
White	0.67	0.67	0.28	0.78
Black	0.18	0.19	-0.88	0.38
Latino	0.12	0.11	0.32	0.75
Asian	0.01	0.01	1.31	0.19
Other Race	0.03	0.03	-0.34	0.73
Immigrant Parent	0.12	0.12	0.24	0.81
Age	15.06	15.23	-1.93	0.06
Mother's Age	38.64	38.41	1.06	0.29
Mother Completed High School	0.8	0.78	0.99	0.32
Mother Completed College	0.21	0.23	-0.81	0.42
Father Completed High School	0.81	0.81	0.32	0.75
Father Completed College	0.22	0.2	1.04	0.3
Total Siblings in HH in Wave I	1.86	1.97	-2.04	0.04
Birth Order	1.43	1.47	-0.72	0.47
Observations	1814	1786		

(b) First Born Females

	Next-Youngest Brother	Next-Youngest Sister	<i>T-Stat</i>	<i>P-Value</i>
White	0.7	0.69	0.19	0.85
Black	0.18	0.18	-0.11	0.91
Latino	0.09	0.1	-0.31	0.76
Asian	0.01	0.01	1.03	0.3
Other Race	0.02	0.03	-0.59	0.56
Immigrant Parent	0.11	0.11	-0.29	0.78
Age	14.98	15.16	-1.91	0.06
Mother's Age	37.96	37.69	1.11	0.27
Mother Completed High School	0.83	0.82	0.48	0.63
Mother Completed College	0.23	0.24	-0.32	0.75
Father Completed High School	0.82	0.85	-1.12	0.26
Father Completed College	0.21	0.2	0.39	0.69
Total Siblings in HH in Wave I	1.59	1.74	-2.55	0.01
Birth Order	1	1		
Observations	1240	1192		

(c) Second Born Females

	Next-Youngest Brother	Next-Youngest Sister	<i>T-Stat</i>	<i>P-Value</i>
White	0.68	0.67	0.21	0.84
Black	0.16	0.19	-0.74	0.46
Latino	0.14	0.13	0.32	0.75
Asian	0.01	0.01	0.79	0.43
Other Race	0.02	0.02	-0.3	0.76
Immigrant Parent	0.1	0.11	-0.27	0.79
Age	15.34	15.43	-0.58	0.56
Mother's Age	39.92	39.32	1.33	0.19
Mother Completed High School	0.81	0.74	1.7	0.09
Mother Completed College	0.19	0.23	-1.38	0.17
Father Completed High School	0.83	0.75	1.73	0.09
Father Completed College	0.27	0.22	1.46	0.15
Total Siblings in HH in Wave I	2.22	2.33	-1.18	0.24
Birth Order	2	2		
Observations	398	423		

(d) Third Born (and Beyond) Females

	Next-Youngest Brother	Next-Youngest Sister	<i>T-Stat</i>	<i>P-Value</i>
White	0.49	0.48	0.11	0.92
Black	0.22	0.31	-1.44	0.15
Latino	0.23	0.18	0.77	0.45
Asian	0.01	0	1.36	0.18
Other Race	0.05	0.03	0.78	0.44
Immigrant Parent	0.29	0.18	1.25	0.22
Age	15.08	15.18	-0.43	0.67
Mother's Age	41.24	41.7	-0.73	0.47
Mother Completed High School	0.57	0.63	-0.78	0.43
Mother Completed College	0.14	0.13	0.18	0.86
Father Completed High School	0.72	0.63	1.01	0.32
Father Completed College	0.17	0.16	0.18	0.86
Total Siblings in HH in Wave I	2.96	2.82	0.61	0.54
Birth Order	3.56	3.64	-0.43	0.67
Observations	176	171		

Note: Means are reported in Columns (1) and (2). The T-Statistics and P-Values are from tests of differences in means between Columns (1) and (2). Wave I sampling weights are used in all calculations.

Table 2: Next-Youngest Brother and Earnings in Adulthood, Females

	(1)	(2)	(3)
	Log Earnings	Log Earnings	Log Earnings
Next Youngest is Brother	-0.0678* (0.0357)	-0.0725** (0.0353)	-0.0771** (0.0350)
Mother's Age	0.187*** (0.0547)	0.124** (0.0537)	0.111** (0.0508)
Mother's Age Squared	-0.00205*** (0.000688)	-0.00137** (0.000674)	-0.00124* (0.000638)
First Child	0.0839 (0.0611)	0.00408 (0.0627)	-0.0148 (0.0621)
Second Child	-0.00542 (0.0678)	-0.0562 (0.0673)	-0.0765 (0.0655)
Mother HS Graduate		0.264*** (0.0555)	0.220*** (0.0579)
Mother College Graduate		0.187*** (0.0535)	0.129** (0.0537)
Father HS Graduate			0.209*** (0.0732)
Father College Graduate			0.125 (0.0756)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	2315	2315	2315
R^2	0.087	0.115	0.127

Note: OLS Parameter estimates and standard errors (in parentheses) are reported. Standard errors are clustered at the school level. Unless otherwise specified, all controls are for Wave I, and Wave I sampling weights are used in all calculations. Race controls include indicators for Black, Latino, Asian, and Other Race (with the omitted category being White). Cohort controls include dummies for the student's age. All regressions also include an indicator for whether the mother is an immigrant and whether the father is an immigrant. If parents' education, age, immigration status, or respondent's birth order is missing, we set the value equal to zero and include a dummy for the presence of a missing value. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Next-Youngest Brother and Educational and Other Labor Market Outcomes, Females

	(1)	(2)	(3)	(4)	(5)
	Any Earnings	Log Weekly Hours Worked	College	Occupational Prestige Score	Occupational Earnings Score
Next Youngest is Brother	-0.0120 (0.0152)	-0.0384*** (0.0139)	-0.0189 (0.0181)	-0.338 (0.596)	-0.323 (1.237)
Mother's Age	-0.0119 (0.0198)	-0.00808 (0.0164)	0.0877*** (0.0239)	1.472* (0.829)	1.370 (1.760)
Mother's Age Squared	0.000237 (0.000237)	0.0000791 (0.000196)	-0.000890*** (0.000300)	-0.0156 (0.0101)	-0.0128 (0.0212)
First Child	0.0977** (0.0411)	0.0191 (0.0275)	0.154*** (0.0470)	2.933** (1.138)	5.668** (2.572)
Second Child	0.0741 (0.0464)	0.0119 (0.0291)	0.108*** (0.0407)	1.106 (1.440)	2.868 (2.884)
Mother HS Graduate	0.0534** (0.0269)	0.0169 (0.0213)	0.131*** (0.0248)	3.295*** (1.007)	4.361** (2.000)
Mother College Graduate	0.00490 (0.0206)	-0.00525 (0.0306)	0.147*** (0.0338)	1.559** (0.781)	4.993*** (1.786)
Father HS Graduate	0.0579* (0.0343)	0.0498* (0.0263)	0.121*** (0.0294)	2.617** (1.128)	6.168*** (1.993)
Father College Graduate	-0.0135 (0.0260)	0.0303 (0.0372)	0.270*** (0.0304)	4.300*** (0.926)	8.747*** (2.152)
Cohort controls	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes
Observations	2678	2105	2836	2777	2777
R^2	0.044	0.031	0.263	0.123	0.097
Dep Var Mean	0.872	3.677	0.332	45.49	44.98

Note: See notes to Table 2. The occupational prestige score refers to the Nakao-Treas Prestige Score [see Nakao and Treas (1994)], obtained from Ruggles et al. (2016). The occupational earnings score is obtained from Ruggles et al. (2016).

Table 4: Family Structure in Adolescence, Females

	(1)	(2)	(3)
	Number of Siblings in HH	Two-parent Household	Mother Worked
Next Youngest is Brother	-0.108** (0.0471)	-0.00144 (0.00954)	0.0232 (0.0207)
Mother's Age	-0.00260 (0.0649)	-0.0137 (0.0125)	0.0385 (0.0282)
First Child	-1.136*** (0.161)	0.0201 (0.0202)	0.0525 (0.0351)
Second Child	-0.511*** (0.159)	0.00139 (0.0187)	0.0927** (0.0374)
Mother HS Graduate	-0.210*** (0.0785)	0.0162 (0.0133)	0.187*** (0.0310)
Mother College Graduate	-0.172*** (0.0451)	0.00141 (0.0131)	0.0814*** (0.0254)
Father HS Graduate	0.0455 (0.0913)	0.0171 (0.0149)	0.0203 (0.0370)
Father College Graduate	0.0877 (0.0626)	-0.00445 (0.0100)	-0.0138 (0.0327)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	3600	3600	3600
R^2	0.208	0.781	0.139
Dep Var Mean	1.914	0.707	0.725

Note: See notes to Table 2.

Table 5: Mechanisms: Parents' School Monitoring and Parents' School Expectations, Females

	(1)	(2)	(3)
	Talked with Child's Teachers	Talked with Child about School or Grades	Disappointed if Child not Grad College
Next Youngest is Brother	-0.0452* (0.0229)	-0.0347* (0.0194)	-0.0350* (0.0181)
Mother's Age	0.0362 (0.0280)	0.00778 (0.0273)	-0.00725 (0.0309)
Mother's Age Squared	-0.000477 (0.000343)	-0.000123 (0.000340)	0.000102 (0.000381)
First Child	-0.0164 (0.0445)	-0.0214 (0.0373)	0.0841* (0.0499)
Second Child	0.0108 (0.0488)	-0.0192 (0.0342)	0.0161 (0.0480)
Mother HS Graduate	0.0309 (0.0322)	0.0890*** (0.0340)	0.00824 (0.0343)
Mother College Graduate	0.00525 (0.0265)	0.0130 (0.0232)	0.147*** (0.0309)
Father HS Graduate	0.0441 (0.0335)	0.00372 (0.0368)	-0.0431 (0.0353)
Father College Graduate	0.0574* (0.0330)	0.0288 (0.0252)	0.113*** (0.0296)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	3212	3600	3206
R^2	0.022	0.035	0.060
Dep Var Mean	0.349	0.771	0.410

Note: See notes to Table 2.

Table 6: Mechanisms: Parents' Time Investment, Females

	(1)	(2)	(3)	(4)	(5)
	Event	Sports	Shopping	Conversation	Meal Days
Next Youngest is Brother	0.0632** (0.0285)	0.0219 (0.0258)	0.0262 (0.0222)	0.0429 (0.0339)	0.0119 (0.104)
Mother's Age	0.105** (0.0428)	0.0364 (0.0302)	0.0180 (0.0321)	-0.0703 (0.0458)	-0.0175 (0.142)
Mother's Age Squared	-0.00129** (0.000527)	-0.000564 (0.000376)	-0.000281 (0.000396)	0.000795 (0.000568)	0.000339 (0.00176)
First Child	0.100* (0.0551)	-0.00454 (0.0434)	-0.00238 (0.0423)	0.00743 (0.0488)	0.339** (0.169)
Second Child	0.0619 (0.0523)	-0.0203 (0.0485)	0.0226 (0.0510)	-0.0305 (0.0522)	0.0733 (0.192)
Mother HS Graduate	0.121*** (0.0404)	0.0531* (0.0308)	0.0663** (0.0303)	0.0801** (0.0386)	-0.0462 (0.163)
Mother College Graduate	0.0295 (0.0407)	0.0740* (0.0391)	-0.00319 (0.0347)	0.0623 (0.0427)	-0.229 (0.164)
Father HS Graduate	0.0535 (0.0538)	0.0939* (0.0476)	-0.0911** (0.0452)	-0.00417 (0.0596)	0.163 (0.191)
Father College Graduate	0.161*** (0.0457)	0.0539 (0.0466)	0.0199 (0.0355)	0.0413 (0.0438)	0.262 (0.211)
Cohort controls	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes
Observations	3382	3382	3382	3382	3580
R^2	0.083	0.137	0.071	0.120	0.123
Dep Var Mean	0.450	0.327	0.959	0.947	4.703

Note: See notes to Table 2.

Table 7: Mechanisms: Parents' Financial Investment, Females

	(1)	(2)
	Received Allowance during Adolescence	Parent Helped Financially during Adulthood
Next Youngest is Brother	-0.0260 (0.0251)	-0.00591 (0.0190)
Mother's Age	-0.00247 (0.0357)	0.0498** (0.0238)
Mother's Age Squared	0.0000350 (0.000439)	-0.000516* (0.000298)
First Child	0.164*** (0.0418)	0.110*** (0.0353)
Second Child	0.0903** (0.0436)	0.0792** (0.0364)
Mother HS Graduate	0.0118 (0.0348)	0.0350 (0.0214)
Mother College Graduate	0.0768** (0.0296)	0.0978*** (0.0287)
Father HS Graduate	0.0386 (0.0420)	0.0551** (0.0261)
Father College Graduate	0.0450 (0.0342)	0.123*** (0.0268)
Cohort controls	Yes	Yes
Race Controls	Yes	Yes
Observations	3554	3600
R^2	0.076	0.114
Dep Var Mean	0.459	0.241

Note: See notes to Table 2.

Table 8: Mechanisms: Parents' Health Care Investment, Females

	(1)	(2)	(3)
	Routine Physical	Routine Dental	Medical Care Received
Next Youngest is Brother	0.0221 (0.0183)	-0.0117 (0.0195)	-0.00572 (0.0175)
Mother's Age	0.0255 (0.0350)	0.0855*** (0.0253)	-0.0401* (0.0236)
Mother's Age Squared	-0.000309 (0.000428)	-0.00100*** (0.000316)	0.000494* (0.000287)
First Child	0.0891* (0.0466)	0.105*** (0.0397)	0.00392 (0.0287)
Second Child	0.0611 (0.0461)	0.0713* (0.0393)	-0.0111 (0.0287)
Mother HS Graduate	-0.0239 (0.0276)	0.0573** (0.0283)	0.0418 (0.0277)
Mother College Graduate	0.0387 (0.0378)	0.00482 (0.0267)	-0.0128 (0.0326)
Father HS Graduate	0.0842** (0.0384)	0.0512 (0.0364)	0.00342 (0.0289)
Father College Graduate	0.0154 (0.0324)	0.103*** (0.0268)	0.0144 (0.0220)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	3579	3589	3599
R^2	0.016	0.070	0.043
Dep Var Mean	0.662	0.683	0.793

Note: See notes to Table 2.

Table 9: Mechanisms: Gender Task Specialization, Females

	(1)	(2)	(3)	(4)
	Total Activities with Mother	Total Activities with Father	Family Interruptions to Work	Number of Children Intended
Next Youngest is Brother	0.105*** (0.0396)	0.0523 (0.0319)	0.0295 (0.0192)	0.163** (0.0780)
Mother's Age	0.0606 (0.0464)	0.0257 (0.0438)	-0.00970 (0.0241)	0.0493 (0.0907)
Mother's Age Squared	-0.000810 (0.000577)	-0.000478 (0.000547)	0.0000388 (0.000301)	-0.000609 (0.00113)
First Child	0.0298 (0.0880)	0.0514 (0.0676)	-0.0348 (0.0391)	0.0142 (0.125)
Second Child	-0.0167 (0.0838)	0.0429 (0.0853)	-0.0322 (0.0378)	-0.0452 (0.130)
Mother HS Graduate	0.196*** (0.0478)	0.104** (0.0477)	-0.0677** (0.0304)	-0.102 (0.0963)
Mother College Graduate	0.124** (0.0591)	0.0504 (0.0590)	-0.0280 (0.0257)	0.139 (0.115)
Father HS Graduate	-0.0550 (0.0597)	0.132* (0.0711)	-0.0320 (0.0314)	0.00232 (0.101)
Father College Graduate	0.0964* (0.0543)	0.153** (0.0613)	-0.0337 (0.0314)	-0.00830 (0.0984)
Cohort controls	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes
Observations	3507	3473	2986	3032
R^2	0.052	0.276	0.038	0.013
Dep Var Mean	1.897	0.802	0.213	2.403

Note: See notes to Table 2.

Table 10: Mechanisms: Disruptive Behaviors, Females

	(1)	(2)	(3)	(4)	(5)	(6)
	Trouble with Teachers	Alcohol	Cigarettes	Marijuana	Damage or Graffiti	Steal
Next Youngest is Brother	0.0392* (0.0207)	0.0395* (0.0236)	0.00520 (0.0193)	0.0399** (0.0198)	0.00808 (0.0183)	0.0119 (0.0175)
Mother's Age	-0.0688*** (0.0262)	0.00149 (0.0331)	-0.0461 (0.0299)	-0.0206 (0.0226)	-0.0137 (0.0228)	0.00512 (0.0214)
Mother's Age Squared	0.000786** (0.000336)	0.00000967 (0.000423)	0.000487 (0.000377)	0.000232 (0.000283)	0.000143 (0.000270)	-0.0000650 (0.000264)
First Child	-0.0522 (0.0440)	0.000493 (0.0368)	-0.0469 (0.0394)	-0.0162 (0.0340)	0.0246 (0.0270)	0.00184 (0.0357)
Second Child	0.00679 (0.0458)	0.0515 (0.0450)	-0.00217 (0.0398)	0.0343 (0.0413)	0.0691** (0.0269)	-0.00613 (0.0354)
Mother HS Graduate	0.0103 (0.0319)	-0.00507 (0.0337)	0.0177 (0.0314)	0.00107 (0.0268)	-0.0239 (0.0263)	-0.00194 (0.0251)
Mother College Graduate	0.00221 (0.0277)	-0.0373 (0.0284)	-0.0160 (0.0278)	-0.000355 (0.0243)	-0.0187 (0.0181)	-0.0207 (0.0216)
Father HS Graduate	-0.0541 (0.0445)	0.00109 (0.0349)	-0.0900** (0.0370)	0.0211 (0.0297)	0.00466 (0.0274)	-0.0353 (0.0345)
Father College Graduate	0.00648 (0.0340)	-0.0370 (0.0373)	-0.0611* (0.0326)	-0.0505* (0.0285)	0.0129 (0.0236)	0.0196 (0.0255)
Cohort controls	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3531	3580	3589	3569	3587	3585
R^2	0.032	0.101	0.064	0.089	0.026	0.026
Dep Var Mean	0.552	0.397	0.334	0.249	0.147	0.172

Table 11: Testing the Mechanisms: Earnings in Adulthood, Females

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Log Earnings	Log Earnings	Log Earnings	Log Earnings	Log Earnings	Log Earnings	Log Earnings	Log Earnings	Log Earnings
Next Youngest is Brother	-0.0901** (0.0398)	-0.0824** (0.0394)	-0.0817** (0.0396)	-0.0932** (0.0401)	-0.0901** (0.0398)	-0.0871** (0.0400)	-0.0785* (0.0404)	-0.0897** (0.0400)	-0.0645 (0.0406)
Mother's Age	0.0995* (0.0584)	0.0964 (0.0582)	0.103* (0.0579)	0.0976* (0.0584)	0.0995* (0.0582)	0.0943 (0.0582)	0.104* (0.0569)	0.0969* (0.0579)	0.0997* (0.0560)
Mother's Age Squared	-0.00109 (0.000733)	-0.00105 (0.000732)	-0.00114 (0.000730)	-0.00107 (0.000735)	-0.00109 (0.000732)	-0.00104 (0.000731)	-0.00116 (0.000718)	-0.00106 (0.000728)	-0.00110 (0.000708)
First Child	0.00633 (0.0697)	0.00892 (0.0680)	-0.0170 (0.0678)	0.00448 (0.0698)	0.00635 (0.0696)	-0.00988 (0.0678)	0.000493 (0.0682)	0.00660 (0.0677)	-0.0325 (0.0640)
Second Child	-0.0651 (0.0779)	-0.0684 (0.0762)	-0.0796 (0.0758)	-0.0653 (0.0771)	-0.0651 (0.0778)	-0.0781 (0.0757)	-0.0673 (0.0762)	-0.0590 (0.0757)	-0.0917 (0.0708)
Mother HS Graduate	0.218*** (0.0699)	0.208*** (0.0696)	0.222*** (0.0687)	0.207*** (0.0711)	0.218*** (0.0700)	0.214*** (0.0700)	0.196*** (0.0696)	0.215*** (0.0687)	0.183*** (0.0692)
Mother College Graduate	0.104* (0.0598)	0.101* (0.0603)	0.0812 (0.0602)	0.105* (0.0594)	0.104* (0.0600)	0.0953 (0.0605)	0.111* (0.0595)	0.102* (0.0601)	0.0815 (0.0609)
Father HS Graduate	0.221*** (0.0775)	0.225*** (0.0776)	0.227*** (0.0786)	0.220*** (0.0773)	0.221*** (0.0777)	0.217*** (0.0773)	0.208** (0.0796)	0.221*** (0.0772)	0.211** (0.0810)
Father College Graduate	0.133 (0.0908)	0.130 (0.0902)	0.109 (0.0910)	0.121 (0.0913)	0.133 (0.0894)	0.114 (0.0899)	0.122 (0.0878)	0.128 (0.0900)	0.0743 (0.0856)
School Monitoring Index		0.0489* (0.0257)							0.0360 (0.0255)
Parental Expectations			0.151*** (0.0398)						0.137*** (0.0415)
Time Investment Index				0.0336 (0.0262)					0.0185 (0.0271)
Health Investment Index					-0.000129 (0.0234)				-0.00314 (0.0231)
Financial Investment Index						0.0463** (0.0222)			0.0387* (0.0226)
Gender Specialization Index							-0.0876*** (0.0256)		-0.0858*** (0.0252)
Disruptive Behavior Index								-0.0350 (0.0249)	-0.0122 (0.0242)
Cohort controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1785	1785	1785	1785	1785	1785	1785	1785	1785
R ²	0.116	0.120	0.125	0.117	0.116	0.119	0.128	0.118	0.142

Note: See notes to Table 2.

Table 12: Earnings in Adulthood, Firstborn Females

	(1)	(2)	(3)
	Log Earnings	Log Earnings	Log Earnings
Next Youngest is Brother	-0.0857* (0.0449)	-0.0861* (0.0444)	-0.0865* (0.0445)
Mother's Age	0.190** (0.0782)	0.120 (0.0814)	0.109 (0.0786)
Mother's Age Squared	-0.00209** (0.000991)	-0.00135 (0.00103)	-0.00122 (0.000997)
Mother HS Graduate		0.294*** (0.0714)	0.267*** (0.0751)
Mother College Graduate		0.192*** (0.0618)	0.141** (0.0620)
Father HS Graduate			0.132 (0.0840)
Father College Graduate			0.127 (0.0773)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	1613	1613	1613
R^2	0.095	0.126	0.133

Table 13: Total Number of Brothers and Earnings in Adulthood, Females

	(1)	(2)	(3)
	Log Earnings	Log Earnings	Log Earnings
Total Number of Brothers	-0.0906*** (0.0242)	-0.0816*** (0.0241)	-0.0833*** (0.0242)
Mother's Age	0.150*** (0.0401)	0.0967** (0.0417)	0.0867** (0.0416)
Mother's Age Squared	-0.00160*** (0.000487)	-0.00104** (0.000503)	-0.000934* (0.000502)
First Child	0.0878* (0.0483)	0.0340 (0.0464)	0.0215 (0.0482)
Second Child	0.0547 (0.0550)	0.0200 (0.0518)	0.00762 (0.0528)
Mother HS Graduate		0.227*** (0.0546)	0.187*** (0.0577)
Mother College Graduate		0.185*** (0.0457)	0.122** (0.0491)
Father HS Graduate			0.174*** (0.0661)
Father College Graduate			0.138** (0.0690)
Cohort controls	Yes	Yes	Yes
Race Controls	Yes	Yes	Yes
Observations	3248	3248	3248
R^2	0.072	0.096	0.107

Note: See notes to Table 2.

10 Appendix

Table A.1: Data Description, Females with a Younger Sibling

Variable	Mean	Std Deviation	Description
Wave I			
White	0.67	0.47	Dummy variable equal to 1 if respondent reported being white
Black	0.18	0.39	Dummy variable equal to 1 if respondent reported being black
Latino	0.11	0.32	Dummy variable equal to 1 if respondent reported being Hispanic/Latino
Asian	0.01	0.1	Dummy variable equal to 1 if respondent reported being Asian
Other Race	0.03	0.16	Dummy variable equal to 1 if respondent reported being of another race (not white, black, Latino, or Asian)
Mother is Immigrant	0.08	0.26	Dummy variable equal to 1 if residential mother is an immigrant
Father is Immigrant	0.09	0.29	Dummy variable equal to 1 if residential father is an immigrant
Immigrant Parent	0.12	0.32	Dummy variable equal to 1 if at least one parent is an immigrant
Age	15.14	1.72	Respondent's age in years as of June 1, 1995
Mother's Age	38.52	4.69	Respondent's mother's age in years
Mother HS Graduate	0.79	0.4	Dummy variable equal to 1 if respondent's mother has a high school diploma
Mother College Graduate	0.22	0.41	Dummy variable equal to 1 if respondent's mother has a college degree
Father HS Graduate	0.81	0.39	Dummy variable equal to 1 if respondent's father has a high school diploma
Father College Graduate	0.21	0.41	Dummy variable equal to 1 if respondent's father has a college degree
Birth Order	1.45	0.83	Birth order (among children of biological parents)
Total Siblings in HH	1.91	1.1	Total Siblings in HH in Wave I
Wave IV			
High School Graduate	0.92	0.27	Dummy variable equal to 1 if respondent has a high school diploma
College Graduate	0.33	0.47	Dummy variable equal to 1 if respondent has a college degree
Weekly Hours Worked	40.95	10.51	Weekly Hours Worked in Current or Most Recent Job (if over 10 Hours)
Works 35+ Hours	0.62	0.48	Dummy variable equal to 1 if respondent has current job and works at least 35 hours per week
Any Earnings	0.87		Dummy variable equal to 1 if respondent reports any earnings over \$2000 in the previous year
Average Earnings	31808.16	33145.95	Average personal earnings in the previous year (if respondent reports any earnings over \$2000)
Median Earnings	28000		Median personal earnings in the previous year (if respondent reports any earnings over \$2000)
Observations	3600		

Note: See notes to Table 2.