Habits that Make, Habits that Break: Early Childhood Behavior Problems and the Gender Gap in Education in the United States

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Abstract

Over the past three decades, females in the United States have comprised a growing majority of high school and college graduates. An understudied explanation for this female advantage in education is females' lower levels of self-regulation problems and social problems. With macro-level social shifts, including gender parity in parental investments in children and the opening of the labor market for women, males' long-standing behavioral disadvantage in childhood now translates into lower levels of educational attainment compared to females. Using newly-available, prospective panel data on a national sample of children followed from birth to age 22, this study shows that females' lower levels of early childhood behavior problems accounts for 15%-25% of today's female education advantage. Males' higher levels of behavior problems result in part from gender-specific responses to certain parenting practices. Mothers report that boys "act out" more than girls in response to exposure to parental conflict and maternal harshness.

1 Introduction

Today, females in the United States are more likely than males to finish high school, to enroll in college, and to complete a college degree (NCES, 2010). This "gender gap in educational attainment" has emerged over the past several decades, representing one of today's most striking demographic shifts (Diprete and Buchmann, 2006; Goldin et al., 2006; Heckman and LaFontaine, 2010). Today the gap is larger than at any point in the last century. The gender gap in attainment also presents a fascinating social puzzle as a rare case of female advantage amid other gender stratification processes that disadvantage women (Risman, 2004).

Macro-level social and economic changes are a key explanation for the gender gap in educational attainment (Goldin et al., 2006). These changes include the opening of the skilled labor market to women and a decline in the low skill jobs that were once open to women (Goldin et al., 2006; Jacob, 2002). After de-industrialization, remaining higher-paying, low-skill jobs (e.g., construction and manufacturing) are heavily male-dominated (Jacob, 2002). Although these labor market pull factors explain somewhere between 30 and 60 percent of the growing female advantage in educational attainment, still 40 to 70 percent of the gender gap in educational attainment remains unexplained by these macro-level social factors (Goldin et al., 2006).

Research has begun to point to the possibility that a micro-level push factor – individuals' behavior problems – also may help explain the gender gap in educational attainment (Buchmann et al., 2008; Farkas, 2003). Females develop lower levels of self-regulation problems and social problems than boys (Kochanska et al., 2000). This has been true for decades (McFadyen-Ketchum et al., 1996). Self-regulation problems include the inability to sit still, to delay gratification, and to concentrate on a given task despite other distractions (Blair, 2002; Peterson and Zill, 1986; Raver, 2002). Social problems include fighting with others and exhibiting temperamental outbursts. Today, mothers rate girls roughly 0.5 standard deviations lower than boys on the composite measure of self-regulation problems and social problems known as "externalizing problems" (Cooper et al., 2011; Dufur et al., 2008; Matthews et al., 2009; Moiduddin, 2008).

Research shows that the gender difference in adolescent behavior problems predicts females' higher level of college enrollment (Jacob, 2002).[1] Another set of studies finds that gender differences in behavioral development specifically measured in early childhood predict the macro-level gender gap in elementary and middle school test score performance, a key mediator of later educational attainment (Cooper et al., 2011; DiPrete and Jennings, 2012). A final set of studies identifies that behavior problems assessed in early childhood predict individuals' level of high school completion and college enrollment (Alexander et al., 1997; Duncan et al., 2007; McLeod and Kaiser, 2004). However, these extant studies do not focus on how micro-level gender differences in early childhood behavior problems may explain the macro-level gender gap in college completion. Where the emphasis is on the gender gap in educational attainment, little attention has been paid to whether this gender stratification process originates in the earliest stages of the life-course through gender differences in the socialization of early childhood behaviors.

The gender gap in self-regulation problems and social problems has existed for decades, but it may be that women were not able to reap the benefits of their behavioral advantage until barriers in the labor market and in cultural expectations about women's attainment and position in society shifted. Recent decades have witnessed delays in mean age at first marriage, which rose from the early to mid-20s over the past several decades (Goldin et al., 2006). In turn, subsequent mean age at first childbirth has also risen (Goodwin et al., 2009; Goldin et al., 2006; Teachman et al., 2000).

Changes in marriage and fertility timing additionally have been accompanied by social changes in the structure and openness of labor markets, in families, and in cultural norms around men and women's educational expectations and labor market opportunities (Goldin, 2006). Dramatic shifts in the structure of the labor market have included the decline of the manufacturing sector and the growth of a service and technology-based economy (Murphy and Welch, 1993). These shifts have led to heightened demand for skilled workers since the 1950s (Murphy and Welch, 1993). Partly owing to females' lower

[1] Life-course research points to the importance of correctly identifying the stage(s) at which a predictor like behavior problems is linked to an outcome of interest, like educational attainment. It is important to note that Jacob (2002) measures behavior problems in adolescence.

baseline wages, females experienced higher returns to schooling than males over this period (Murphy and Welch, 1989). At the same time, existing unskilled blue collar jobs that do not require higher education (e.g., construction) remain more open to males (England and Farkas, 1986). It is possible that a result of social and economic changes such as these, females' lower levels of externalizing problems came to explain at least part of the relatively newly-emergent gender gap in educational attainment that we see today. These cultural and social shifts may have created the structural circumstances necessary for females to realize the benefits of their long-standing early childhood behavioral advantage.

Perceptions of gender differences in labor market opportunities also may influence links between the gender gap in early childhood self-regulation problems and social problems and educational attainment. Educational expectations are one way parents transmit their perceptions of their child's labor market prospects to their child. Children form their own educational (and labor market) expectations by internalizing these signals from parents, as well as those they receive from peers, teachers, and siblings. If parents today set higher educational expectations for girls than in the past, we may see gender parity in parents' educational expectations. Gender parity in parents' educational expectations may reflect parents' realization that the transition to a service and technology economy calls for a larger population with post-high school training than in the past. In a labor market more open to women than in the past, the high educational expectations parents set for their daughters, who are on average more attentive and socially adept, may facilitate females' higher level of attainment compared to males (Cho, 2007; England and Farkas, 1986; Goldin et al., 2006; Reskin, 1990).

The female behavioral advantage may be compounded additionally because boys' educational expectations for themselves are more likely than girls' to be lowered by social factors in schools. Same-gender peers may internalize anti-school attitudes reflected in the school culture, especially in low socioeconomic status schools (Legewie and DiPrete, 2012). Boys and girls then may ultimately modulate their behaviors differently in response to the differing educational expectations they perceive from peers and influential adults. Or, early childhood behavior problems may persist throughout childhood inde-

pendent of educational expectations. Continuity in behavior problems would suggest that early childhood is an especially critical period for positive behavioral development (Caspi et al., 1995; Cherlin et al., 1998) (for a partial alternative to this behavioral continuity perspective, see McLeod and Kaiser (2004)).

The present study seeks to test these understudied hypotheses. This study utilizes newly-available longitudinal data of children followed from birth to age 22 to ask whether micro-level gender differences in early childhood behavior problems may scale up to help explain today's macro-level gender gap in educational attainment. By bringing insights from life-course research to research on early childhood behavioral development and the female advantage in educational attainment, this study furthers our understanding of gendered early life behaviors as a cause of female advantage in educational attainment.

This work also aims to discern the specific factors within families that contribute to the gender gap in behavior in the first place. Research has shed light on the role of family instability, particularly father absence, in helping account for the gender gap in childhood behavior (Bertrand and Pan, 2011; Cooper et al., 2011). However, other research also shows that children's behaviors are shaped by dynamics within the family – such as parenting styles and parental conflict (Deater-Deckard and Dodge, 1997; Moffitt et al., 2002; Moiduddin, 2008). Gendered responses to common family dynamics may help account for the gender gap in childhood behavior. But, a limited number of studies examined family structure and family dynamics together with an eye toward gender differences in behavioral development (Cooper et al., 2011).

The Gender Gap in Early Childhood Behavior Problems and Educational Attainment

> **Hypothesis 1:** When scaled up to the level of gender groups, girls' lower mean levels of early childhood self-regulation problems and social problems explain a substantial share of today's gender gap in educational attainment.

Findings from recent studies are consistent with this hypothesis, which is depicted by path 2 of the conceptual model shown in Figure 1. Research shows that today's gender gap in early childhood behavior problems is linked to the gender gap in elementary and middle school academic achievement. "Social and behavioral skills" (DiPrete and Jennings, 2012)

and "anti-school attitudes and behavior among boys" (Legewie and DiPrete, 2012) explain roughly one-third to one-half of the gender gap in reading and math test scores at the end of elementary school. The gender gap in adolescent (i.e., eighth grade) school disciplinary and behavioral problems explains a substantial share of the female advantage in college enrollment (Jacob, 2002).

[FIGURE 1 ABOUT HERE]

These findings from studies focused specifically on explaining gender differences in educational achievement and college enrollment are supplemented by other studies that highlight the lasting effects of behavior on education when controlling for gender, but not trying to explain gender differences in education. Early childhood behavioral skills are linked to adult high school completion and college enrollment for national samples of children (McLeod and Kaiser, 2004; Moffitt and Caspi, 2001; Shonkoff and Phillips, 2000), and to years of schooling at age 22 in a regional sample (Entwisle et al., 2005). Research also shows that adolescent behavioral skills are linked to high school completion, college enrollment, and four-year college completion (Farkas, 2003). Having been suspended from school at least once by eighth grade decreases the likelihood of completing high school by 17 percentage points, the likelihood of attending college by 16 percentage points, and the likelihood of being a college graduate by 9 percentage points (Bertrand and Pan, 2011). However, understudied is the association between early childhood behavior problems and college completion net of differences in family context and individual characteristics (paths 1 and 2 of Figure 1). By extension, it is unclear whether females' lower level of behavior problems helps explain today's female advantage in educational attainment.

The Mediating Roles of Gender Differences in Educational Expectations and Continuities in Behavior Problems

> **Hypothesis 2a:** On average, girls' higher level of educational expectations mediate the relationship between girls' lower early childhood behavior problems and today's gender gap in educational attainment.

Research also is inconclusive on the pathways through which early childhood behavior may be linked to educational attainment, particularly college completion. Hypothesis

2a, depicted by paths 4 and 5 of Figure 1, shows that part of the relationship between the gender gaps in early childhood behavior and educational attainment may be mediated by a gender difference in mothers' educational expectations for sons and daughters. Recognizing today's labor market to be more open to women than it was in previous generations, mothers may set as high of educational expectations of girls as boys. Mothers also may be sensitive to the gender differences in children's early behavior, knowing their girls' behaviors may now be rewarded differently in terms of attainment in light of their brighter labor market prospects (path 4).

At the same time, negative sanctions in school and exposure to peers who may foster anti-school attitudes (see Legewie and DiPrete (2012)) may lead boys – especially those with behavior problems – to seek alternatives to formal secondary and post-secondary schooling. Through a combination of teacher and peer influences in school (Legewie and DiPrete, 2012) and parent influences at home, children may adjust their behavior in response to the expectations and encouragement they receive from influential adults and peers (path 5). The result may be a gender gap in levels of educational expectations, which then reinforces a gender gap in late childhood behavior as children modulate their behavior in response to the educational expectations they internalize. Educational expectations may therefore mediate the path between early and late behavior problems. Path 6 of Figure 1 represents any direct correlation between the gender difference in educational expectations and that in educational attainment that does not operate through the gender difference in late childhood behavior problems.

> **Hypothesis 2b:** On average, girls' lower mean levels of late childhood self-regulation problems and social problems mediate the relationship between girls' lower early childhood behavior problems and today's gender gap in educational attainment.

By contrast, research also shows that early behavior problems and college enrollment are linked through continuity between early and late childhood behavior problems (McLeod and Kaiser, 2004). On average, the gender gap in behavior problems between boys and girls remains of similar magnitude throughout childhood (Caspi et al., 1995; Cherlin et al., 1998). In this vein, hypothesis 2b – depicted by paths 3 and 7 of Figure 1 – proposes that the gender difference in mean levels of late childhood behavior prob-

lems also predicts differences in levels of educational attainment. Late childhood behavior problems therefore may help explain the gender gap in educational attainment.

Complicating these hypotheses is some empirical support for the notion that the relationship between early childhood behavior problems and high school completion operates through lower cognitive ability (McLeod and Kaiser, 2004). One way to investigate the hypothesis that, on average, patterns of early childhood behavior persist throughout childhood net of differences in cognitive ability is to control for a temporally-prior measure of early childhood cognitive development. Therefore, rather than relying on school test scores previously used to measure children's grasp of concepts taught in the classroom, I control for children's scores on the Peabody Picture Vocabulary Test (PPVT). PPVT is highly correlated with adult intelligence test scores and measured when children are 2.5 to 4 years of age (Altepeter, 1989; Dunn, 1965). This measure of early childhood cognitive development enables a conceptual shift in focus away from cognitive skills and toward the potentially persistent female advantage in childhood behavior as a primary pathway of interest (paths 3 through 7 of Figure 1).

Taken together, hypotheses 2a and 2b propose that gender differences in mean levels of educational expectations and late childhood behavior problems mediate the path through which gender differences in early childhood behavior problems predict gender differences in levels of educational attainment. As a result, gender differences in educational expectations and/or in late childhood behavior problems may help explain the gender gap in educational attainment.

The Social Drivers of the Gender Gap in Behavior

> **Hypothesis 3:** The gender gap in self-regulation problems and social problems at ages 4 or 5 is driven by boys' more negative (or less positive) responses to similar levels of exposure to parental conflict, harshness, positive discipline and maternal warmth, and cognitive support.

Some research has shown that aspects of family structure and instability help explain the origins of the gender gap in early childhood behavior (Bertrand and Pan 2011; Cooper, Osborne, Beck, and McLanahan 2011). This research highlights gender differences in children's responses to similar levels of exposure to father absence and family instability.

However, psychological and sociological research also shows that family dynamics like parental conflict and parenting styles shape children's behavioral development (Aunola and Nermi 2005; Jekielek 1998; Johnson, Kalil, and Dunifon 2012). Sociologists have not fully contextualized the importance of parental conflict and parental harshness, positive discipline, maternal warmth, and cognitive support for early childhood behavior gap.

Parental conflict and parenting styles may shape the gender gap in early childhood self-regulation and social skills through two primary channels (or some combination thereof): 1) boys' and girls' differing exposure to family dynamics, or, 2) boys' and girls' differing responses to relatively similar types of exposure to family dynamics. Recent research shows that, with the rise of gender egalitarianism in households and changing norms and expectations around women's educational opportunities and familial and societal roles, parents' differential investments in sons and daughters have diminished significantly (Buchmann, DiPrete, and McDaniel 2008). It is therefore more likely that the gender gap in early childhood behavior largely results from boys' and girls' differing responses to relatively similar types of exposure to family dynamics.

2 Data and Measures

Data and Sample Restrictions

This study uses data from the 1979 National Longitudinal Survey of Youth (NLSY79) and the Children of the National Longitudinal Survey of Youth (NLSY-C). The NLSY-C consists of the roughly 6,900 children who were born between 1979 and 2010 to NLSY79 women who were aged 14 to 21 in 1979. Between 1986-2010, the NLSY-C collected detailed developmental information biennially for children aged 4 to 16. 2,074 children were born between 1983-1986. Educational attainment at age 22 and behaviors at ages 4 or 5 are available for 1,752 of these 2,074 children; roughly 440 children per birth cohort.

The structure of these data and the timing of variables collection are shown by year, age and birth cohort in Figure 2. The X's indicate the chronological progression of each birth cohort from age 0 to age 22. The brackets detail timing of variables collection and are discussed in the Appendix.

[FIGURE 2 ABOUT HERE]

Treatment of Missing Data and Sensitivity Analyses

Multiple imputation of twenty datasets using the built-in multiple imputation procedure in Stata 11 address item-missingness on key predictors (Royston, 2004). Dependent variables like educational attainment (missing for approximately 15% of cases) and childhood behaviors (missing for roughly 18% of cases, almost all of which were also missing on educational attainment) were included in imputation. Observations with imputed dependent variables were dropped prior to analyses based on the strategy of multiple imputation then deletion (Von Hippel, 2007). Imputed predictor variables with high missingness included: parental conflict (35%), household income at age 4 (16%), cognitive support at age 4 (12%), maternal discipline and warmth at age 4 (12%), and maternal harshness (8%). The imputed working sample consisted of 1,752 observations. Given the extent of item missingness, three sets of sensitivity analyses were conducted: (1) Replication with complete cases only; (2) Replication with a second multiply-imputed dataset in which the variances of imputed items were increased by 10% to partially test violation of the missing-at-random assumption (Allison, 2000; Lynch and Brown, 2014), and; (3) Assessment of systematic biases in item-missingness by regressing a binary indicator for missingness on the dependent variable on observed covariates. This tests whether the dependent variable is missing-at-random as a function of observed predictors. Substantive results did not change, and few systematic biases in missingness were identified.

Measures

Dependent Variables

The following variables correspond to those shown in boxes in Figure 3. Educational attainment (EDU) includes binary indicators for high school and four-year college completion as of age 22 as well as a continuous variable for years of schooling completed.[2,3] Years of schooling is used in addition to four-year college completion partly because it helps capture intermediate attainment outcomes such as college enrollment and partial or 2-year college completion, and partly for methodological reasons described below.

[2]The small number of respondents completing a GED prohibit modeling GED completion separately. Combining high school and GED completion did not change substantively.

[3]Many of the children born in the second half of 1986 begin kindergarten a year after their cohortmates born in the earlier part of 1986 and turn 24 after their survey date in 2010. Therefore, I am only able to report four-year college completion rates as of 2010.

[FIGURE 3 ABOUT HERE]

The second set of dependent variables are summed indexes measuring self-regulation problems and social problems and their composite, externalizing behavior problems, at ages 4 or 5 and 10 or 11 (BEH), as shown in Table 1 (Peterson and Zill 1986).[4,5] The externalizing problems index uses six items based on mother reports for how frequently the child: (1) is impulsive or acts without thinking, (2) is restless, overly active, or can't sit still, (3) has trouble getting along with other kids, (4) breaks his/her own or another's things deliberately, (5) is not liked by other children, and (6) has a strong temper and loses it easily, on a scale of 1 (never) to 3 (often). The externalizing problems scale ranges from six to eighteen and has a Cronbach's alpha of 0.70.[6] The self-regulation problems and social problems sub-scales are shown in Table 1. Note that consistent with most psycho-biologists notion of self-regulation (see Blair (2002)), the self-regulation sub-scale includes a measure of concentration that is excluded from the overall externalizing problems measure to preserve its comparability to other externalizing problems scales: "How frequently does your child have difficulty concentrating?"

[TABLE 1 ABOUT HERE]

The third dependent variable is the average of the mother and child's educational expectations for the child when the child was 8 or 9 years old (EXP). Separately, both mother and child were asked: "How far do you expect [your child] to go in school?" Responses included: 1 (leave high school before graduation), 2 (graduate from high school), 3 (get some college or other training), 4 (graduate from college), or 5 (get more than four years of college). Mother's and child's educational expectations are averaged in order to capture: (1) the way parents transmit their perceptions of their child's labor market opportunities to the child, and (2) the way the child's own educational expectations are shaped by peers, teachers, and parents.

[4]Children's behavior was only observed every other year in the NLSY-C. Some children were assessed at age 4 (or age 10) and others at age 5 (or age 11).

[5]Note that unstandardized scores have high internal validity; standardizing would change the research question by ranking children relative to one another. However, using related behavior scales, DiPrete and Jennings (2012) find that results were consistent across standardized ranks and non-standardized scores.

[6]These six items provide coverage of each of the three sub-scales—self-centered/explosive, attention problems/overactive, and antisocial/aggressive—that are encompassed within the full externalizing problems scale used in the Pre-Kindergarten Behavioral Skills-2nd Edition and Child Behavior Checklist, also shown in Table 1.

Key Predictor Variables

I differentiate between structural factors affecting childhood context (STR) and family dynamics (DYN). Structural factors include: 1) family composition at birth (a dummy for father absent at birth); 2) family composition at age 4 (indicators for single mother, social (i.e. non-biological, residential) father), and; 3) educational and economic resources (mother's years of schooling at birth and household income at age 4 (in $1,000s in models; divided by 25,000 for ease of display in figures). Family dynamics include: a parental conflict scale and three parenting practices scales (maternal harshness, positive discipline and warmth, and cognitive support). Parental conflict (Cronbach's alpha=0.73) is a summed index of mother's responses to the NLSY79 survey administered in 1988: "On a scale of 1 (never) to 4 (often) about how frequently do you and the child's father argue about: chores and responsibilities, money, children, showing affection, religion, leisure time, drinking, other women, or relatives."[7]

The parenting practices summed indexes shown in Table 2 are age-appropriate measures of parent-child interaction between child ages 0 to 5). Maternal harshness (Cronbach's alpha=0.60) includes : (1) an indicator for insecure attachment at age 2 (whose construction is detailed in the footnotes of Table 2, and; (2) an indicator for whether the child was spanked in the past week when she or he was between ages 3 and 4. Insecure attachment and spanking are within a single measure as in prior work combining maternal coercion and non-affection into a single item (McFadyen-Ketchum et al., 1996) and based on research suggesting a bi-directional association between them (Bugental and Happaney, 2004; Carlson, 1998).

[TABLE 2 ABOUT HERE]

Mother's positive discipline and warmth (Cronbach's alpha=0.68) includes indicators for: (1) mother "always" talks to child while working at home (0-2 years); (2) mother hugs, kisses or caresses child during interviewer observation (0-2 years); (3) mother talks to the child when child acts out physically (i.e., tries to hit the mother) (3-4 years), and; (4) mother sends the child for a timeout when child acts out physically (3-4 years).

[7]Items were worded with regard to the biological father even if he was not present in the household. Children were aged 2-5 years at the time parental conflict was collected.

Cognitive support (Cronbach's alpha=0.76) includes indicators for: (1) parent(s) reads to the child every day (0-2 years); (2) child has more than 5 push/pull toys and more than 10 children's books (0-2 years); (3) television is on in the home for less than 3 hours per day (3-5 years); (4) parent(s) takes the child to the grocery at least twice per week (0-2 years), and; (5) child goes outside the house daily (0-2 years).

Demographic & Health Context, Cognitive Skills, and Internalizing Behavior Demographic and contextual factors of the child's birth (DEM) include: mother's age at birth, cognitive development at 3-4 years, asthma or an ear infection by age 4 (mother's report), birth weight (pounds), gestation time (weeks),[8] birth order, race/ethnicity, birth year, and internalizing behavior problems at 4 or 5 years.[9]

Cognitive skills are captured by Peabody Picture Vocabulary Test (PPVT) scores measured at child ages 3 to 4. PPVT is standardized within-age so that the slight upward trend in scores by age is adjusted relative to the scores of other children of the same age at test administration. I use a temporally prior measure of cognitive skills to adjust for variation in cognitive ability without focusing on cognitive ability as a key pathway.

Internalizing problems use maternal reports of: (1) child seems unhappy, sad, or depressed, and; (2) child is too fearful or anxious. Measured on a scale of 1 (never), 2 (sometimes), to 3 (often), these items span the main social withdrawal and the anxiety/somatic problems components of internalizing problems. They appear in the Pre-Kindergarten Behavioral Skills, 2nd Edition (PKBS-2) and the Behavior Problems Index (BPI).[10]

3 Analytic Strategy

To test hypotheses one and two about links between gender differences in mean levels of early and late childhood behavior problems, educational expectations, and educational

[8]Reported by the mother in the first interview period after the child's birth.

[9]At the extreme, boys' behavior problems may be associated with males' higher rates of adolescent criminal activity and high school dropout, whereas girls' behavior problems may be associated with teen pregnancy (Ensminger and Slusarcick, 1992; Sampson and Laub, 1995). Original models therefore also controlled for conviction status (ever-convicted by age 18 for high school completion or age 22 for college completion) and pregnancy (had a child by age 18 for high school completion or age 22 for college completion). Although statistically significant, these have a negligible effect on the gender gap in educational attainment.

[10]Models run with all NLSY-C BPI internalizing problems items did not change substantive results.

attainment, I first test whether the relationships posited by the conceptual model bear out empirically. I estimate a series of regressions shown by numbered paths in Figure 3. Figure 3 operationalizes the conceptual model in Figure 1. I use OLS regressions for paths 1a-1c and 3-5 with semi-continuous outcomes (i.e., educational expectations, behavior) as well as for paths 2, 6, and 7 when the outcome is years of schooling. The continuous outcome for years of schooling tests for robustness of the results against the possibility of bias due to rescaling of the unobserved residual variance when comparing coefficients across nested logit models (Allison, 1999; Karlson et al., 2012). I use logistic regressions for the binary outcomes of high school and college completion (paths 2, 6, and 7). Continuous and semi-continuous predictor variables are centered at their sample-specific means.

The magnitudes of the regression paths gives one indication of meaningful pathways, but it is also useful to know how much of the variance in a given outcome (i.e., educational expectations, behaviors at ages 10-11, attainment) can be attributed to a covariate of interest, net of prior covariates. Therefore, I also fit a series of nested analysis of variance models following the paths shown in Figure 3.[11] I calculate the percent of variance explained by the addition of the covariate of interest net of all other prior covariates using the equation:

$$\textit{\% of variance explained|prior covariates} = \frac{(RSS(y_n|\phi) - RSS(y_n|\phi, x_{n-1}, x_{n-2}, ...)}{RSS(y_n|\phi))} * 100 \quad (1)$$

where RSS is the residual sum of squares, y_n a dependent variable, and ϕ a vector of all prior covariates in Figure 3. Logistic regressions use deviance, not RSS.

Then, directly testing hypotheses one and two, I calculate the percent of the gender gap in educational attainment that can be explained by the gender difference in exposure to the seven potential sets of mechanisms: demographic context, economic resources, family structure, family dynamics, educational expectations, and early behavior problems, and late behavior problems.[12] In the baseline specification $Logit(pr(EDU)) = \beta_0 + \beta_1(Male)$, β_1 is the gender gap in educational attainment. I then fit a series of nested logit models for

[11]Note that analysis of variance is also a goodness-of-fit, or diagnostic, tool. Therefore I do not report additional fit statistics in the appendix tables.

[12]Note that I added family income at age 4 and mother's education at birth separately, but because their effect on the gender gap in attainment is so small, I report them when added together for parsimony.

the binary outcomes of high school completion and college completion, adding sequentially to the baseline model the mechanisms of interest noted above. In specification k (ranging from 1 to 7 for the seven vectors of potential mechanisms):[13]

$$Logit(pr(EDU)) = \beta_0 + (Male)\beta_1 + \sum_{j=1}^{k} z_j\gamma_j \tag{2}$$

where z_j are vectors of covariates for the mechanisms of interest (e.g., demographic characteristics, family structure, etc.) and γ_j are the corresponding coefficient vectors.

The gender gap in educational attainment also may be conceptualized as the relative difference in the odds between males and females, or $e^{\beta_1} - 1$. The percent of this gender gap explained by the gender difference in the added mechanism is the percent change in this relative difference. The difference between models in the cumulative percent of the gender gap explained is the percentage-point increase in explained attainment gap.

Finally, to test hypothesis three about the drivers of the early childhood behavior problems gap, I employ a Oaxaca-Blinder decomposition. This two-stage process identifies the contributions of each family, demographic, and health mechanism to the overall gender gap in externalizing problems at ages 4 or 5, as shown in equation (3) below:

$$\begin{aligned} EXTERN_M - EXTERN_F \;\; &= \;\; \overbrace{(x'_M - x'_F)\beta}^{exposure} \;\; + \;\; \overbrace{\bar{x}'(\beta_M - \beta_F)}^{vulnernability} \end{aligned} \tag{3}$$

where $(x'_M - x'_F)\beta$ is the contribution of a given variable to the gender gap due to gender differences in means (i.e., exposure) of a given predictor, and $\bar{x}'(\beta_M - \beta_F)$ is the contribution due to difference in the effects of each variable for boys compared to girls. Because the results from the decomposition of externalizing problems closely resemble those for self-regulation problems and social problems, I report only the former (but results for self-regulation problems and social problems are available upon request). Finally, in order to address the possibility of reciprocal causality between externalizing problems and cognitive skills, all models were estimated without controlling for cognitive skills (i.e., PPVT). Coefficients on the other observed factors did not change substantially.

[13] I use corresponding OLS models for the continuous outcome of years of schooling completed.

4 Results

In line with prior research, children in this national sample born between 1983 and 1986 exhibit marked gender differences in childhood behavior and educational attainment (see Figure 4 and Appendix Table A.1). Girls display lower levels of self-regulation problems (0.29 standard deviations, t=6.22), social problems (0.21 standard deviations, t=4.82), and externalizing problems (0.28 standard deviations, t=6.49) at ages 4 or 5. At the group level, means for behavior remain of roughly similar magnitudes at ages 10 or 11. The gender gap in externalizing problems, self-regulation problems, and social problems also grows only slightly by ages 10 or 11. Females out-pace males in rates of high school completion by 7%, or roughly 0.18 standard deviations (t=-4.63) and four-year college completion by 7% (0.20 standard deviation; t=-3.45). Girls also express and receive from mothers educational expectations on par with the expectations received by boys. On average both girls and boys say at ages 8 or 9 that they expect to "graduate from college." Parents also on average expect both their sons and daughters to "get some college or other training." However, it is worthwhile to note that girls fall on average a significant 0.17 points higher than boys in terms of mother's educational expectations of them (0.17 standard deviations; t=-3.41), and rate their own expectations on average 0.12 points higher than do boys (0.11 standard deviations; t=-2.29). A discussion of gender differences in the other variables are in the Appendix.

[FIGURE 4 ABOUT HERE]

Pathways Between Childhood Behavior, Educational Expectations, and Educational Attainment

A shown by path 2 of Figure 3, I predicted that early childhood self-regulation problems and social problems would be on average associated with lower levels of educational attainment, including college completion. The results shown in Table 3 support this claim, revealing that early childhood behavior is a significant predictor of educational attainment (see also appendix tables A.2-A.4). Children who fall one unit above the mean in self-regulation problems, social problems, or externalizing behavior problems at ages 4 or

5 on average experience 5, 9, and 7 percent lower odds of high school completion, net of controls. They experience 8, 16, and 7 percent lower odds of 4-year college completion. And, they receive on average 0.10, 0.08, and 0.09 fewer years of schooling.

An analysis of the variance in educational attainment explained by the addition of early childhood behavior problems at ages 4 or 5, net of controls, provides an assessment of model fit underlying the significant associations between early childhood behavior and educational attainment into context. Table 3 shows that early childhood self-regulation problems, social problems, and externalizing problems reduce the unexplained variance in high school completion by 12%, 24%, and 31%. They reduce the unexplained variance in 4-year college completion by 5%, 4%, and 8%. In line with prior research (Entwisle et al., 2005), early childhood behavior problems are key predictors of educational attainment.

[TABLE 3 ABOUT HERE]

As shown by paths 3 and 7 of Figure 3, I posited that late childhood self-regulation problems and social problems and educational expectations on average would mediate the relationship between early childhood self-regulation problems and social problems and educational attainment. Table 3 shows that early childhood behavior problems are partially associated with educational attainment through late childhood behavior problems. Path 3 of Table 3 shows that children one unit above the mean in self-regulation problems, social problems, and externalizing behavior problems at ages 4 or 5 on average fall 0.40, 0.34, and 0.39 units higher in the corresponding behavior problem at ages 10 or 11. Early behavior problems also explain a share of the unexplained variance in late childhood behavior. Self-regulation problems, social problems, and externalizing problems at ages 4 or 5 explain 12%, 13% and 15% of the unexplained variance in the corresponding behavior problem at 10 or 11. Although this may seem like a modest percent of variance explained, other results (see Appendix A.2-A.4) indicate that when early childhood behavior is added to a model of educational attainment on late childhood behavior, the relationship between early behavior and educational attainment loses statistical significance and the odds ratio becomes essentially 1. This indicates late childhood behavior is a key mediator of the association between early behavior and educational attainment.[14]

[14]A correlation matrix was also generated to examine shifts in behavior problem scores between early

Results also point to path dependencies between early behavior problems and educational expectations. Path 4 of Figure 3 and Table 3 shows that children one unit above the mean in self-regulation problems, social problems, and externalizing behavior problems at ages 4 or 5 on average fall 0.10 points lower in mother and child's average educational expectations. Path 5 shows that children whose average educational expectations are one unit above the mean are 0.32, 0.14, and 0.23 units lower in self-regulation problems, social problems, and externalizing behavior problems at ages 10 or 11.

Hypothesis 2a posited that educational expectations mediate the link between early behavior problems and educational attainment for both genders. Despite the significant pathways between early childhood behavior problems, educational expectations and late childhood behavior problems (paths 4 of Figure 3 and Table 3), early childhood behavior problems explain under 2% of the unexplained variance in educational expectations net of demographic, health, and family predictors. Educational expectations explain under 4% of the variance in childhood behavior problems at ages 10 or 11, net of behavior problems at ages 4 or 5 and demographic controls (path 5). Educational expectations predict educational attainment. But, as we will see, early and late childhood behaviors explain more of the unexplained variance in educational attainment, net of controls.

To test the first part of hypothesis 2b, path 7 of Figure 3 and path 6 of Table 3 display that late childhood behavior problems predict educational attainment. Children who fall one unit above the mean level of self-regulation problems, social problems, or externalizing behavior problems at ages 10 or 11 experience roughly 9% lower odds of high school completion for each behavioral measure. They experience 24%, 14%, and 17% lower odds of 4-year college completion. And, they earn on average 0.12, 0.08, and 0.08 fewer years of schooling. Late childhood self-regulation problems, social problems, or externalizing problems explain 41%, 36%, and 37% of the unexplained variance in high school completion net of demographic, health, and family covariates, early behavior

and late childhood. Results (available upon request) suggest over half of children experienced a downward shift (by 2 to 3 points) in behavior problem scores by ages 10 or 11. But, children's positions in the behavioral distribution did not change substantially. This suggests continuity in behavioral problems relative to one's same-aged peers over time, in spite of a general trend toward lower levels of behavioral problems for most children as they age.

problems, and educational expectations. Late childhood self-regulation problems, social problems, or externalizing problems explain 44%, 10%, and 24% of the unexplained variance in 4-year college completion, and 47%-48% of the unexplained variance in years of schooling. The larger percent of unexplained variance accounted for by late (v.s. early) childhood behavior problems reflects the temporal proximity between late childhood behavior and educational attainment. In line with prior research, behavior problems tend to explain more of the variance in high school rather than college outcomes (McLeod and Kaiser, 2004). Self-regulation problems in late childhood are most robustly associated with post-secondary outcomes, explaining 44% of the variation in college completion.

Gender, Childhood Behavior Problems, and Educational Attainment

The gender component of the hypothesis 1 proposed that, when individuals' micro-level behavior problems scores are scaled up to the group level, the gender gap in early childhood behavior problems in the mid-to-late 1980s would help account for today's gender gap in educational attainment. In order to contextualize results for the differing mechanisms that might account for the gender gap in educational attainment, Figure 5 displays the cumulative percentage of the gender gap in high school completion, 4-year college completion, and years of schooling explained by seven sets of possible mechanisms: demographic and health context (including internalizing problems), family structure, family economic resources, family dynamics, mother's and child's average educational expectations (hypothesis 2a), early behavior problems at ages 4 or 5 (hypothesis 1), and late behavior problems at ages 10 or 11 (hypothesis 2b).

Models 2 through 5 of Figure 5 show that gender differences in demographic, health context, and internalizing behavior problems, mother's education and family economic resources, family structure, and family dynamics together explain between 6% and 10% of the gender gap in high school completion, college completion, and total years of schooling.[15]

[15]Results not shown here indicate that gender differences in conviction status and pregnancy explain under 1 percentage-point of the gap in any educational attainment outcome beyond that explained by prior predictors. In the case of conviction status, this might be because few individuals (under 5%) have a criminal record, or because the effects of the marked gender differences in criminal convictions are highly correlated with other observed predictors of the gender gap in educational attainment.

[FIGURE 5 ABOUT HERE]

Hypothesis 2a predicted that, since daughters on average perceive educational and labor market incentives on par with or even slightly higher than sons' (Jacob 2002) and are less likely to have educational expectations lowered by same-gender peers (Legewie and DiPrete, 2012), gender gaps in parents' and children's educational expectations would play an important role in accounting for the gender gap in educational attainment (paths 4, 5, and 6 of Figure 3). Model 6 of Figure 5 reveals that gender differences in educational expectations account for an additional 0 to 7 percentage-points of the gender gap in educational attainment.[16] This result lends at best modest support to hypothesis 2a.

In support of hypothesis 1 (path 2 of Figure 3), models 7(a) through 7(c) of Figure 5 reveal that the gender gap in educational attainment is explained in part by the gender difference in mean levels of early childhood behavior problems (see also appendix tables A.2-A.5).[17] Model 7(a) shows that early self-regulation problems account for an additional 15-20 percentage-points of the gender gap in educational attainment. Model 7(b)-7(c) show that early social problems explain an additional 25 and 11 percentage-points of the gender gap in high school and college completion compared to model 6, and an additional 13 percentage points in years of schooling. Early externalizing problems account for an additional 12-25 percentage-points of the gap in high school and college completion and years of schooling. Although results indicate that early behavior problems are more predictive of high school completion than college completion, the gender gap in early self-regulation problems explains slightly more of the gender gap in four-year college completion than it does of the gap in high school completion.

Taken together, the gender gap in early externalizing problems explains roughly 80% of the component of the gender gap in high school completion explained by observed factors, or roughly 25% of the total gap. Early externalizing problems account for 60% of the component of the gender gap in college completion accounted for by observed factors,

[16]The percentage point of the gap in attainment explained is the difference between the cumulative percent of the gender gap explained between models.

[17]Note that, since educational expectations are measured at ages 8 or 9, whereas behavior is measured at ages 4 or 5, as a sensitivity check I reversed the order in which I added educational expectations and the early behavior problems scale to the final model. Results did not change.

or roughly 14% of the total gap. And early externalizing problems account for 45% of the component of the gender gap in years of schooling explained by observed factors, or 15% of the total gap. Importantly, when behavior is added to the model first, results indicate that behavior problems explain an even larger share of the gender gap in each educational attainment outcome. However, in order to preserve chronological ordering within the life-course, behavior is added after demographic and family environment factors.

In support of hypothesis 2b, models 8(a) through 8(c) of Figure 5 (which correspond to paths 3 and 7 of Figure 3) show that continuity in mean gender differences in behavior problems between early and late childhood mediates the gender gap in educational attainment. Models 8(a)-8(c) of Figure 5 add to models 7(a)-7(c) the corresponding behavior problems score at ages 10-11. We know that late childhood behavior problems are significant predictors of educational attainment, as shown in Table 3. For high school completion, models 8(a)-8(c) show that the slightly larger mean gender difference in late behavior problems accounts for roughly an additional 5 percentage-points of the gender gap in high school completion than the mean gender difference in all prior covariates in models 1-7, including early childhood behavior problems. However, these additional 5 percentage points are roughly only 20% to half as much as that explained by the gender gap in early childhood behavior problems.[18]

For college completion, models 8(a)-8(c) of Figure 5 indicate that the mean gender difference in late childhood self-regulation problems accounts for roughly an additional 3 percentage-points of the gender gap in college completion than that explained by the mean gender difference in early childhood self-regulation problems, net of all other prior covariates. The gender difference in late childhood social problems and externalizing problems explain no more of the gap in college completion than that explained by that in early childhood social problems and externalizing problems, ceteris paribus. For years of schooling completed, the mean gender difference in each late childhood behavior problem explains between roughly 0.5-3 percentage points more of the gender gap in years

[18]However, it is important to note that if late childhood behavior problems are added without early childhood behavior problems, a large share of the explanatory power attributed to early childhood behavior problems is attributed to late childhood behavior problems. Implications are discussed in the discussion.

of schooling than that explained by the mean gender difference in each early childhood behavior problem, ceteris paribus.[19] Together, these results indicate that the gender difference in late childhood behavior problems mediates the relationship between the gender gap in early childhood behavior problems and the gender gap in educational attainment.

Drivers of the Gender Gap in Behavior Problems

The third hypothesis regarding gender predicted that the gender gap in self-regulation problems and social problems at ages 4 or 5 would be driven by boys' more negative responses to similar levels of exposure to parental conflict and harshness, and less-positive responses to positive discipline and maternal warmth and cognitive support.[20] The decomposition results presented in Table 4 support this hypothesis. Results are presented for the decomposition of externalizing problems because this scale encompasses most facets of self-regulation problems and social problems and because the sub-scale results do not change substantive conclusions (results for self-regulation problems and social problems available upon request). Columns (1) and (2) of Table 4 display uncontrolled, gender-specific means for all family, demographic, and health variables used in the prior analyses. As in other regression analyses, continuous variables are centered at their overall sample mean. Columns (3) and (4) display coefficients for each variable's association with externalizing problems, by gender. Column (5) shows how much male-female differences in exposure at particular levels (i.e. means) of each predictor contribute to the overall gender gap, as shown in the first part of equation (3). The largest gender difference in exposure is to parental conflict. Males are exposed on average to slightly higher levels of parental conflict than females. This differential exposure to parental conflict accounts for

[19]Results shown in models 8(a)-8(c) of appendix tables A.2-A.4 reinforce this finding. When late childhood behavior problems are added in to models 8(a)-8(c), the odds ratio (or OLS coefficient in the case of the model for highest grade completed) for early childhood behavior problems approaches 1 (and the OLS coefficient approaches 0).

[20]A related question concerns whether the gender gap in behavior problems at ages 4 or 5 is driven by the worst- compared to the best-behaved children and, in particular, by the worst-behaved children in high-conflict families. Results indicate that the magnitude of the gender gap increases from the 10th to the 90th percentile in the overall sample (as shown in Appendix A.1) and that this pattern is even more pronounced among children raised in high vs. low parental conflict families (as shown in the Appendix A.2). For example, Appendix A.1 shows that the gender gap in externalizing problems increases from just 0.27 points among the best-behaved boys and girls to 3.5 times that – or 0.94 points – among the least. This result is more pronounced for the self-regulation problems and social problems scales, where the gender gap is 0.14 and 0.01 between the best-behaved boys and girls and over 7 and 130 times as large between the worst-behaved boys and girls.

6.6% (or 0.036 points) of the overall (0.59 point) gender gap in externalizing problems.

[TABLE 4 ABOUT HERE]

In contrast to differences in exposure, column (6) shows how much of each variable's raw point contribution to the gender gap is attributable to male-female differences in the effects of each predictor at the sample-average level of exposure, as shown in the second part of equation (3). The majority of the positive effects of parental conflict on the gender gap in externalizing problems arise from parental conflict's otherwise more negative association with males' externalizing problems. Column (7) sums the point-contribution of each variable due to differences in both exposure and effects, showing each variable's contribution to the overall gender gap. The sum of column (7) is 0.59 – the magnitude of the overall gender gap in externalizing problems also shown in Figure 4 and Table A.1. Columns (8) and (9) translate the magnitudes into percentage terms. For all predictors that are associated with an increase in the gap, column (8) calculates the proportion of the total positive effects that are due to gender differences in the levels and effects of each variable. Parental conflict, parental harshness, and positive discipline and warmth, for example, accounts for 50.1%, 10.7%, and 15.8% of all positive effects on the gender gap in externalizing problems. These three factors account for over 75% of the positive effects on the gender gap in externalizing problems at ages 4 or 5.[21] Column (9) does the same for all variables whose overall effects are associated with a decrease in the magnitude of the gender gap. Cognitive support, for example, accounts for 11.3% of all negative ("gap-narrowing") effects.

Sensitivity Analyses

Given the extent of item-missingness due largely to attrition from the sample between birth and age 22, three sets of sensitivity analyses investigate the possibility of systematic attrition and biases in my estimates due to my treatment of missing data. First, I conducted logistic regressions containing binary indicators for item-missingness on each variable shown in 3 on all temporally prior predictor variables. Few systematic patterns were identified (results available upon request). The last two analyses helped test the

[21] In line with decomposition results, the gender gap does not seem to be driven as strongly by the worst-behaved children in single-mother families at age 4 (as shown in Appendix A.2).

sensitivity of results to any partial violation of the missing at random assumption (Allison, 2000). I replicated analyses on complete cases only. Then I constructed another sample of 20 imputed datasets where the variance on imputed items was increased by 10%. The latter tested whether introducing noise in the multiple imputation procedure would significantly weaken the associations between the pathways of interest. In both cases, results did not change substantively.

Two additional sensitivity analyses addressed possible issues of reverse-causality in the prediction of gender gaps in early childhood behavior. First, it is possible that children's behavior shapes both cognitive ability and parenting, although I model the reverse associations. I therefore estimated all models predicting the gender gap in behavior without controls for cognitive ability (i.e., PPVT score). Results indicated that substantive conclusions did not change. Second, to adjust for the possibility that parental conflict and parenting were responsive to children's behavior, I included controls for child temperament at ages 2 to 4. I found that the associations between parental conflict or parenting practices and children's behavior did not change significantly.

Finally, this sample of 1983-1986 births in the Children of the NLSY were to mothers aged 18 to 29. That these children were born to younger mothers raises the question of whether results hold even for children born later, to older mothers. As a robustness check, analyses for high school completion were replicated for children born in 1990 to mothers aged 25 to 32 years at birth. Substantive conclusions about the paths between early childhood behavior problems and high school completion, the relationships between the gender gap in behavior and attainment, and the drivers of the gender gap in behavior did not change.

5 Discussion

This study uses prospective panel data of children followed from birth to age 22 to begin to develop a theoretical and empirical framework for understanding the origins of today's female advantage in educational attainment. Past research has focused on the effects of the opening of the labor market to women, which creates larger incentives for women's

college attainment (Jacob, 2002; Kane, 1994; Murphy and Welch, 1989, 1992). The present study finds support for an alternative, but complementary perspective: this rare case of female advantage in status attainment is linked to the female advantage in childhood self-regulation and social skills originating as early as age four.

Although research on the effects of women's higher returns to schooling has gained substantial empirical support in explaining today's gender gap in attainment, it has tended to shift emphasis away from the possibility that the gender gap in educational attainment may originate early in life. The present study highlights gender differences in early behaviors as important factors in understanding the gender gap in educational attainment evident today. Expanding on status attainment research's emphasis on educational expectations, this study shows that parents' perceptions of sons and daughters' differing labor market opportunities are also key. Parents' educational expectations partly are shaped by their perceptions of the feasibility of their child earning a college degree. "Feasibility" may be shaped partly by awareness that females may now mobilize their long-standing behavioral advantage into college attainment and participation in white-collar jobs. Responsive to girls' behavioral advantage, parents set high educational expectations for their daughters. Girls respond positively to these high expectations while boys' behavior is more negatively influenced by a peer culture that defines success outside of the traditional channels of formal schooling. The behavior gap then persists into late childhood.

At least partly through these pathways, the present study extends to college completion previously established associations between early childhood behavior problems and high school completion and college enrollment (Entwisle et al., 2005; McLeod and Kaiser, 2004; Moffitt and Caspi, 2001; Shonkoff and Phillips, 2000). It finds that a one-unit increase above the sample mean level of behavior problems at ages 4 or 5 is associated with a 14 to 24 percent reduction in the odds of four-year college completion. Although educational expectations are a key component of the status attainment model, they have not been considered in prior studies of the gender gap in educational attainment. Parents' educational expectations are important because children's early educational and labor market expectations are filtered through their parents. Children's own educational ex-

pectations are also important because they reflect messages from peers, teachers, siblings, and parents about how far the child can and should aspire to go in school and in the labor market. Together, early childhood behavior responds to parenting, and parent and child educational expectations respond to early childhood behavior. In turn, children's late childhood behavior is to some degree shaped by educational expectations and ultimately helps explain much of the variation in educational attainment.

This study also begins to consolidate theories about the importance of family dynamics in stratification processes by highlighting aspects of family context not generally considered within the status attainment model (for an exception, see Astone and McLanahan (1991)). The female advantage in self-regulation and social skills is driven by dynamics within the family, such as parental conflict and parenting practices. Although boys and girls are exposed to similar family dynamics, boys respond more negatively to parental conflict and harsh parenting, and less positively to positive discipline and maternal warmth than girls. Gendered responses to these family dynamics account for roughly 75% of the gender gap in behavior at ages 4 or 5. These findings add nuance to sociological understanding of the importance of social origins. Status attainment theory has tended to focus on structural aspects of social origins that bear lasting associations with adult outcomes. The incorporation of nuanced, but often overlooked, family dynamics such as parenting practices and parental conflict into research in the status attainment tradition advances sociological understanding of how gender differences in children's behaviors shape female advantages in educational attainment.

These findings begin to cohere into an empirically-supported theory of the importance of the gender gap in early childhood behavior for explaining today's gender gap in educational attainment. For those focused on identifying interventions for boys at high risk for school dropout, the findings presented here point to the potential efficacy of programs and policies that address boys' behavioral development as a route for boosting educational attainment and also potentially avoiding their engagement in deviant behavior more broadly. For those concerned with the broad landscape of female disadvantage in its many forms – segregation by field of study, institutional selectivity, occupational seg-

regation, motherhood penalties, and earnings inequality – the present study offers insight into how females leverage their behavioral advantage within one particular arena.

Findings also illuminate a number of outstanding quandaries. Further investigation of the following questions would advance sociological understanding in the area of family dynamics, children's behavior, educational attainment, and gender gaps in each. First, through what mechanisms do boys and girls respond differently to dynamics within families even when they are exposed to almost identical levels of these dynamics? Past research highlights physiological differences and gene-environment interactions that lead to sex differences in responses to family disruptions (with worse behavioral and educational outcomes for boys) (Deater-Deckard and Dodge, 1997; Krein and Beller, 1988).

However, two related but additional mechanisms also may be implicated. The first is environmental. Girls have higher levels of father absence at birth and single motherhood at age 4. These patterns suggest that boys' exposure to higher conflict may be due to the fact that parents are more likely to remain in bad marriages if they have a son. Boys also are more likely to live with stepparents. Future research should investigate whether boys are more vulnerable to parental conflict because of their higher levels of exposure to environments associated with parental conflict. Research also should explore which environments are most implicated.

The second potential mechanism is social psychological. Boys on average may be sensitized to negative stereotypes about their proclivity toward problem behavior. This awareness may manifest as a self-fulfilling prophesy analogous to that of stereotype threat for minority students and academic performance (see Steele and Aronson (1995) and Owens and Massey (2011)) or women in math and science/engineering or entrepreneurship (Correll and Ridgeway, 2006; Thebaud, 2010). Through the internalization of negative-ability stereotypes of "behavior-problem boys" potentially accompanied by a sense of academic fatalism, boys may respond more negatively to family dynamics like parental conflict and harsh parenting and less positively to positive discipline and maternal warmth. Identification of these processes should be a primary aim of further research.

Second, the present study emphasizes children's responses to parents, but do parents'

responses to children also vary based on the behavior of sons and daughters? A limitation of the present study is its inability to investigate how parenting practices are affected by children's behavior problems. Because parenting is based on age-appropriate measures of parents' interactions with their children, much of the information on parenting collected in early childhood is not available after ages 4 or 5 when behaviors are collected. Sensitivity analyses discussed above indicate that the associations between parental conflict and parenting and behavior remain even after controlling for temperament, which helps address the possibility of reverse-causality. In addition, the pathway between children's behavior and parents' educational expectations may pick up on some aspects of parents' responses to children's behavior, since parents' educational expectations likely incorporate feedback due to children's behaviors. Nonetheless, the strongest claims from this study relate to the unidirectional mechanism through which children respond to parenting, and not the other way around. Sociological understanding would be strengthened by future research examining the bi-directionality of the effects of parent-child interactions.

Third, this study is based on investigation of between-person differences in the pathways of interest; that is, it identifies some degree of continuity in mean gender differences in behaviors throughout childhood, as do Belsky et al. (1998); Cherlin et al. (1998). But are early childhood behaviors linked to educational attainment as strongly for boys and girls whose behaviors change by late childhood? What are the most common behavioral trajectories for boys and girls whose behaviors change substantially throughout childhood?

Finally, the present study examines whether links between gender gaps in behavior and educational operate through gender gaps in parent and child educational expectations. It finds limited support for this hypothesis, suggesting that other indirect paths are more centrally implicated. Future research should investigate the pathways that mediate associations between the gender gap in early childhood behavior and those in educational attainment. Related, that the mean gender difference in late childhood behavior problems explains a similar proportion of the gender gap in educational attainment as the gender difference in early childhood behavior problems (and slightly more in the case of high school completion) raises a policy question about the best point in the life-course

to target any interventions aimed at minimizing the gender difference in behavior problems. Future research should identify whether early- or late-childhood interventions have greater impact specifically for gender differences in behavioral development.

Fourth, this study focuses on links between gender gaps in behavior and educational attainment at the aggregate level, controlling for social class. However, research points to social class differences in gender gaps in both educational attainment (Bailey and Dynarski, 2011) and childhood development (Moiduddin, 2008). The gender gap in educational attainment is largest in the top quartile of the income distribution, although it permeates the income spectrum (Bailey and Dynarski, 2011). The gender gap in childhood development is also ubiquitous across the social class distribution (based on proxies for social class such as neighborhood resources and family structure) (Hetherington et al., 1982; Krein and Beller, 1988; Moiduddin, 2008). There is also some evidence that parenting practices vary by socioeconomic status, suggesting a possible mechanism for the gender gap in childhood development especially among lower socioeconomic status families (Moiduddin, 2008). Future research should examine socioeconomic gradients in the links between gender gaps in childhood development and educational attainment.

Salient changes in educational attainment in the last three decades paint a rosy picture for women when using the broadest measures of educational attainment, as is the case in the present study. But, these shifts in certain of women's educational fortunes should not eclipse the importance of other forms of persistent gender inequality. Women continue to experience segregation in field of study, institutional prestige, and occupation. The aim of this study is to shed light on the mechanisms by which women have attained relative success in one particular area within a wider landscape that continues to be marked by gender inequality. The hope is that by better understanding the processes through which certain gains have been made, future research and policy may be better suited to address the other faces of gender inequality. In this light, future research should also examine the disconnects whereby female advantages in early childhood behaviors may fail to translate into advantages in the labor market, particularly in terms of occupational segregation.

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Table 1: Items in the Externalizing Problems, Self-Regulation Problems, and Social Problems Scales in the NLSY-C

SELF-REGULATION PROBLEMS:
(I) Attention Problems/Overactive
-Is impulsive/acts without thinking
-Is restless, overly active, can't sit still
(II) Concentration
-Has difficulty concentrating
SOCIAL PROBLEMS:
(I) Antisocial/Aggressive
-Has trouble getting along with other kids
-Breaks own or another's things deliberately
-Is not liked by other children
(II) Self-Centered/Explosive
-Has a strong temper and loses it easily
Cronbach's Alpha (full scale): 0.70
NOTES: Items are based on mother reports on a scale of 1 (never) to 3 (often). The externalizing scale used here consists of the subset of Child Behavior Checklist (CBCL) items selected by Peterson and Zill (1986) for use in the Behavior Problems Index (BPI) that overlaps with items used in the equally well-known Pre-Kindergarten Behavioral Skills Scale, 2nd edition (PKBS-2). This subset of items has been established to be a more valid index of externalizing than that used in the BPI alone (Guttmanova et al. 2007). The resulting externalizing scale is an index that sums 6 of the 7 items shown above from across the lack of self-regulation and lack of social skills subscales. Only the item measuring concentration is excluded from the overall externalizing scale to preserve comparability with other commonly-used externalizing scales, which usually do not include concentration. The lack of self-regulation and lack of social skills scales are distinct subsets of the overall externalizing scale, as indicated above. The lack of self-regulation scale includes the item measuring concentration because concentration is a central part of most psycho-biologists' notion of self-regulation (Blair 2002).

Table 2: Parenting Measures Used in Analyses of the NLSY-Children Born 1983-1986

Scale Description	Item Description[3]	Age(s)
Maternal Harshness (0-2)	Cronbach's alpha=.6027	0-5
Maternal Attachment Type: Insecure Attachment (0-1)[1]	Binary "insecure attachment" classification constructed from maternal responses to a subset of the Rothbart Behavior Questionnaire and Kagan's Compliance Scale, which comprise the Attachment Insecurity Scale[1]	2
Spanking (0-1)	Binary measure of whether or not mother has spanked child in the past week	3-5
Positive Discipline and Warmth (0-4)	Cronbach's alpha=0.6782	0-5
Maternal Warmth (0-2)	Binary measure for whether mother "always" talks to child while working around the house	0-2
	Binary measure for whether mother caressed, kissed, or hugged child at least once during interviewer observation	0-2
Positive Discipline (0-2)	Binary measure for whether one of the mother's responses to being hit by child is to send the child to his/her room	3-5
	Binary measure for whether one of the mother's responses to being hit by child is to talk to the child	3-5
Cognitive Support (0-5)	Cronbach's alpha=0.7575	0-5
Literacy Environment (0-3)[2]	Binary measure for whether mother reads to child "every day"	0-2
	Binary measure for whether child has more than 5 push/pull toys AND more than 10 children's books	0-2
	Binary measure for whether television is on in home for less than 3 hours per day, on average	3-5
Exploration Outside Home (0-2)	Binary measure for whether parent(s) take child to the grocery at least twice per week	0-2
	Binary measure for whether child goes outside the house "daily"	0-2

[1]The Attachment Insecurity Scale (INSECUR) has an observed scale range of 5-40 based on maternal responses to the Rothbart Infant Behavior Questionnaire and Kagan's Compliance Scale. Items include: trouble soothing or calming; stays close to mother during play; copies mother's behavior; cries when left alone; demanding and impatient when mother is busy; gets worried when mother is upset; wants help). Following a classification scheme based on patterns observed nationally in the ECLS-B and in the Ainsworth studies in which 54-55% of children age 2 are identified as "insecure" (see page 24 in "Chapter 8: Toddler's Security of Attachment Status" in the ECLS-B Toddler Attachment Sort 45 data documentation), I classified the lowest 60 percent of scores as "secure" and highest 40 percent as "insecure".

[2]Based on research indicating that the national average for hours of television per day among children under 7 ranges from 2 to 2.5 (see Boller et al. 2004 and Rideout et al. 2003), with only 29 percent of this programming educational in nature (Bickham et al. 2003), I classify 3 or more hours of television per day as 0 (not improving the home literacy environment), and under 3 hours of television per day as 1 (literacy-enhancing).

[3]All items are based on maternal report, except the second item of maternal warmth (whether mother hugged, kissed, or caressed child during observation), which is based on interviewer report.

Table 3: Hierarchical Anova Table Corresponding to the Path Model of Figure 3

Path	Dependent Variable	Mediating Covariate[1]	Mediating Behavior Problem (at 4-5)[2]	Odds Ratio	Sig	% of Variance Explained[3]	Path	Dependent Variable	Mediating Covariate[1]	Mediating Behavior Problem (at 4-5)[2]	β	Sig	% of Variance Explained[3]	Path	Dependent Variable	Mediating Covariate[1]	Mediating Behavior Problem (at 10-11)[2]	Odds Ratio	Sig	% of Variance Explained[3]
2	High School Completion	BEH4-5|φ	SR	0.950	*	11.669	3	Behavior at 10-11	BEH4-5|φ	SR	0.403	***	11.660	6	High School Completion	BEH10-11|EXP, BEH4-5,φ	SR	0.916	*	40.842
			S	0.906	*	23.942				S	0.340	***	12.859				S	0.914	*	35.866
			E	0.929	*	30.748				E	0.388	***	15.385				E	0.914	*	37.138
2	4-yr Coll. Completion	BEH4-5|φ	SR	0.839	**	4.692	4	Education Expect.	BEH4-5|φ	SR	-0.081	***	1.540	6	4-yr Coll. Completion	BEH10-11|EXP, BEH4-5,φ	SR	0.756	***	43.499
			S	0.928	*	3.954				S	-0.098	***	1.690				S	0.860	*	10.345
			E	0.922	*	7.553				E	-0.061	***	1.339				E	0.830	**	24.394
2	Years of Schooling	BEH4-5|φ	SR	-0.097	**	13.245	5	Behavior at 10-11	EXP|BEH 4-5, φ	SR	-0.317	***	3.806	6	Years of Schooling	BEH10-11|EXP, BEH4-5,φ	SR	-0.120	**	47.676
			S	-0.040	+	4.527				S	-0.135	**	1.603				S	-0.084	*	46.599
			E	-0.059	*	8.168				E	-0.227	**	1.983				E	-0.076	*	47.016

[1]Variable numbers are the same as those used in Figure 3. The mediating covariate is added to the nested model conditional on temporally preceding covariates. Phi (φ) represents the family context variables also shown in Figure 3.

[2]SR=Self-regulation problems; S=Social problems; E=Externalizing problems.

[3]The "explained variance" is the percent of the previously unexplained variance that is accounted for by the addition of the mediating covariate of interest, net of controls (see equation 1). The residual sum of squares (RSS) is used to capture the difference between the predicted and observed values in the case of OLS regression (paths 3, 4, and 5 as well as paths 2 and 6 for years of schooling), while the deviance is used with logistic regressions (paths 2 and 6 for high school and college completion).

Table 4: Two-Way Decomposition of Gender Differences in Externalizing Problems at Ages 4 or 5: Levels vs. Effects of Parenting, Family Context, and Demographic and Health Factors in the Late 1980s

	Means		Coefficients				Decomp of Levels	Decomp of Effects	Overall Effect of Levels & Coefficients	Prop. of positive effects on gap	Prop. of negative effects on gap
	(1) M	(2) F	(3) M	Sig	(4) F	Sig	(5)	(6)	(7)	(8)	(9)
Parental Conflict Scale	2.099	2.019	0.611	***	0.286	*	0.036	0.669	0.705	**0.501**	0.000
Parental Harshness Scale	1.289	1.275	0.537	***	0.425	***	0.007	0.144	0.151	**0.107**	0.000
Positive Discipline and Warmth Scale	1.967	1.977	0.063		-0.050		0.000	0.223	0.223	**0.158**	0.000
Cognitive Support Scale	1.330	1.412	-0.100		-0.029		0.005	-0.097	-0.092	0.000	**0.113**
Mother's Years of Schooling at Birth[1]	0.037	-0.035	-0.116	**	-0.096	*	-0.008	0.000	-0.008	0.000	0.009
Household Income, Age 4[1]	0.016	-0.015	-0.045		-0.009		-0.001	0.000	-0.001	0.000	0.001
Father Absent at Birth	0.248	0.301	0.182		0.070		-0.007	0.031	0.024	0.017	0.000
Single Mother, Age 4	0.280	0.321	0.168		0.130		-0.006	0.011	0.005	0.004	0.000
Social Father, Age 4	0.030	0.027	0.191		0.326		0.001	-0.004	-0.003	0.000	0.004
Mother's Age at Birth[1]	0.104	-0.097	0.050		0.010		0.006	0.000	0.006	0.004	0.000
PPVT Score[1]	0.003	-0.002	-0.282	***	-0.136	*	-0.001	0.000	-0.001	0.000	0.001
Internalizing Score, Age 4[1]	4.000	4.000	0.000		0.000		0.000	0.000	0.000	0.000	0.000
Birthweight[1]	0.128	-0.120	-0.004		-0.111	+	-0.014	0.000	-0.014	0.000	0.017
Gestation Time[1]	-0.006	0.006	0.007		-0.039		0.000	0.000	0.000	0.000	0.000
Birth Order	1.940	1.900	-0.097		-0.012		-0.002	-0.163	-0.165	0.000	**0.203**
Asthma Diagnosis by Age 4	0.073	0.044	0.312		0.131		0.006	0.011	0.017	0.012	0.000
Ear Infection Diagnosis by age 4	0.015	0.011	-0.362		0.646		0.001	-0.013	-0.013	0.000	0.015
Black	0.276	0.307	-0.274		0.219		0.001	-0.144	-0.143	0.000	**0.175**
Hispanic	0.192	0.183	-0.334	+	0.129		-0.001	-0.087	-0.088	0.000	**0.108**
Born 1984	0.253	0.245	-0.271		0.272	+	0.000	-0.135	-0.135	0.000	**0.166**
Born 1985	0.249	0.220	-0.331		0.208		-0.002	-0.126	-0.128	0.000	**0.157**
Born 1986	0.219	0.229	-0.069		0.047		0.000	-0.026	-0.026	0.000	0.032
_Cons	1.000	1.000	7.176	***	6.901	***	0.000	0.275	0.275	0.196	0.000
							0.022	0.568	0.590	1.000	1.000
% of Gender Gap Driven by Levels vs. Effects:							**0.023**	**0.977**			

[1]Variable centered at the late-1980s sample-specific mean. See Appendix A.1 for uncentered means.

Figure 1: Conceptual Model of the Associations Between Childhood Self-regulation and Social Skills, Educational Expectations, and Educational Attainment

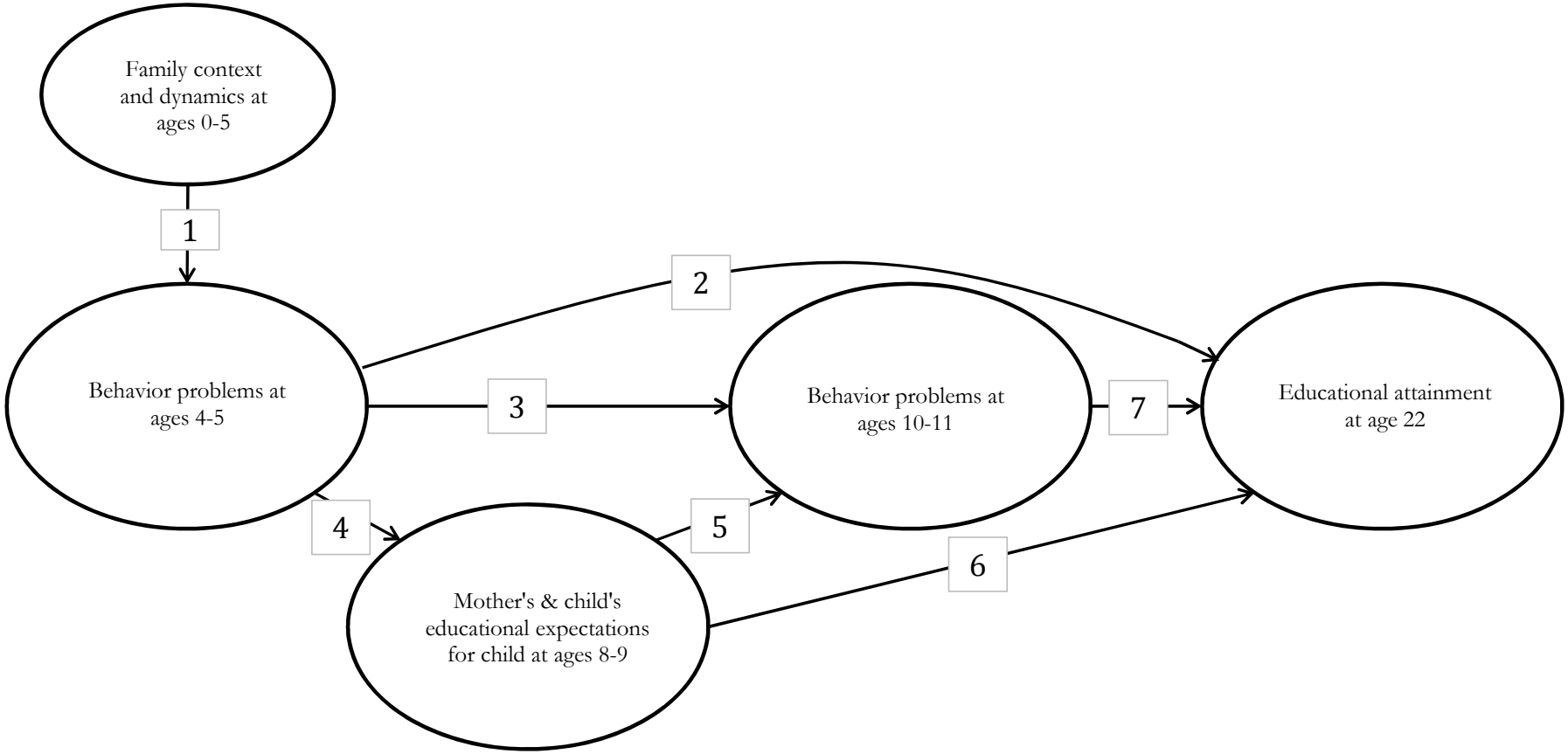
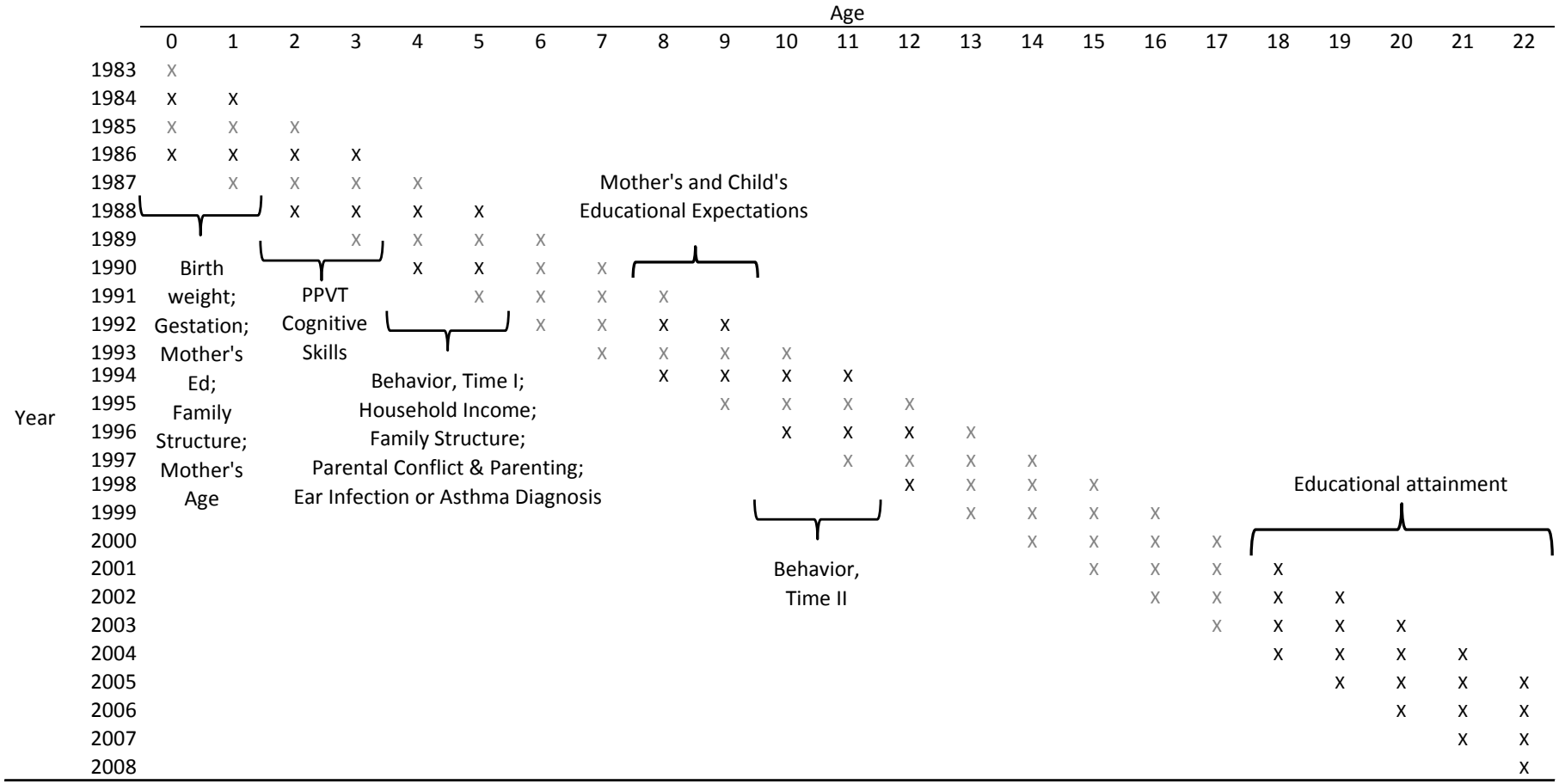


Figure 2: Data Structure and Measure Coverage, by Age and Birth Cohort



NOTE: A black X indicates that coverage for a given set of measures is available for a particular birth cohort and age.

Figure 3: Path Model of the Associations Between Childhood Self-Regulation and Social Skills, Educational Expectations, and Educational Attainment

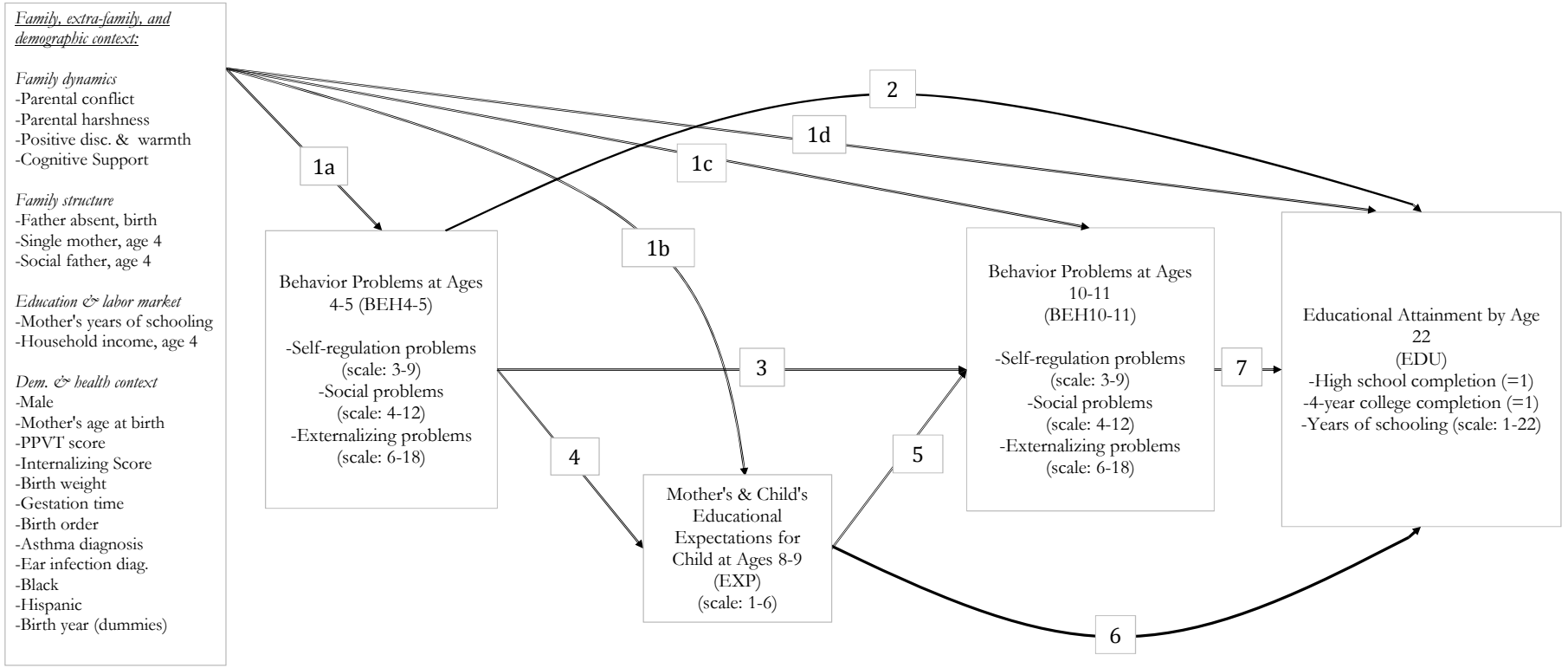


Figure 4: Means of Variables Used in the Analyses, by Gender

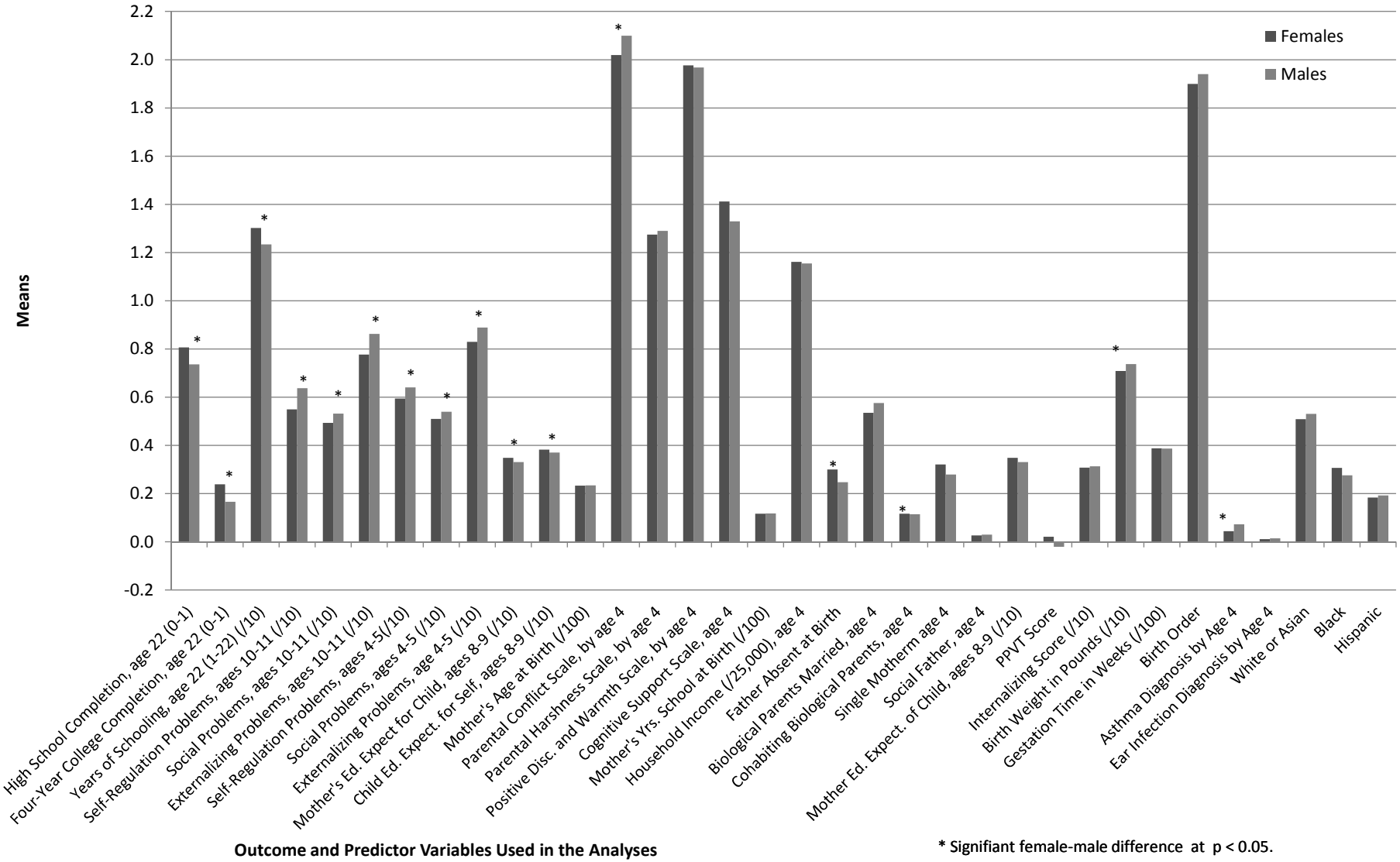
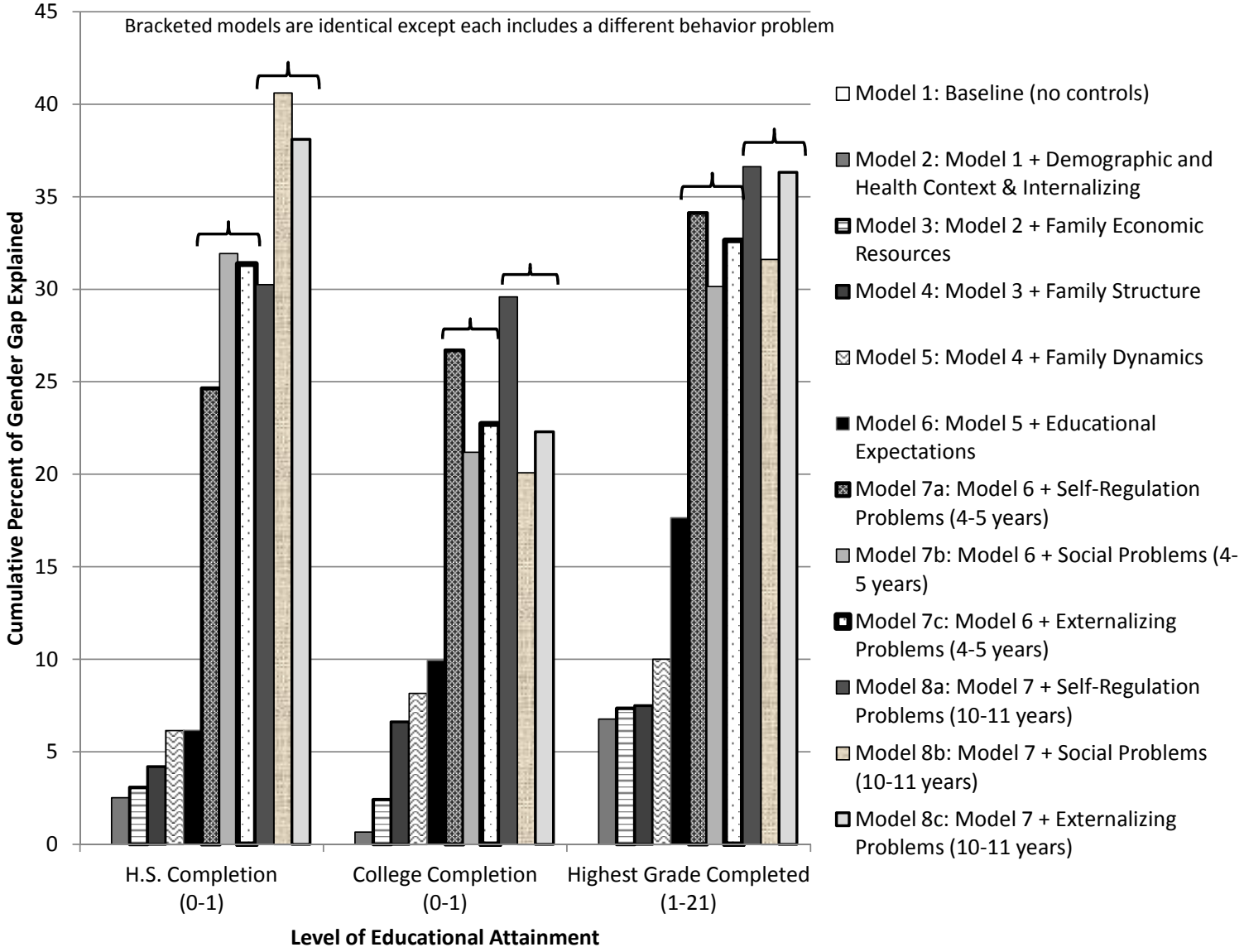


Figure 5: Cumulative Percent of the Gender Gap in High School Completion, College Enrollment, and 2- or 4-Year College Completion Explained through the Addition of Demographic, Health, and Family Context, Educational Expectations, and Behavior Problems



Appendix

Scale Construction

Externalizing problems, self-regulation problems, social problems, and internalizing problems scales are commonly used in the child development literature (Peterson and Zill, 1986). Although complete sets of well-known scales, such as the Pre-Kindergarten Behavioral Skills, 2nd Edition (PKBS-2), are most comprehensive, many studies use subsets of the full scales due to time and budget constraints when fielding surveys (Crone and Whitehurst, 1999). In the NLSY-C, the Behavior Problems Index (BPI) derived from the Achenbach Child Behavior Checklist consists of ten externalizing behaviors items. However, research shows that a subset of these ten externalizing behaviors items – those that overlap with the externalizing behaviors scale derived from the equally well-known PKBS-2 – are a more valid set of measures (Guttmannova et al., 2008). Of the ten externalizing behaviors items in the NLSY-C, six items overlap across the both the subset of BPI externalizing behaviors items in the NLSY-C and the PKBS-2 externalizing problems scale. That the externalizing problems scale used here includes only 60% of all 10 BPI items available is common practice. For example, the full PKBS-2 externalizing problems scale consists of 27 externalizing problems items, but a subset of only 8 are used to measure externalizing problems in large, national datasets such as the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). Importantly, items common across both datasets are worded virtually identically, measured at the same ages, and collected from the same reporting party (in this case, maternal reports). Similarly, of the fifteen items in the PKBS-2 internalizing problems scale, two are available in the NLSY-C through the BPI. For the validity and comparability reasons discussed above, I rely on these two internalizing problems items described in the variables section.

Sensitivity analyses to examine the internal and predictive validity of the externalizing problems, self-regulation problems, social problems, and internalizing problems scales revealed high correlations between each scale and the complete corresponding scale from which the subset items draw (results available upon request). For example, in the NLSY-C, the externalizing problems behaviors scale comes from the Behavior Problems Index,

which is a subset of ten items taken from the Achenbach Child Behavior Checklist. Each sub-scale is highly correlated (above 0.90) with the complete set of externalizing problems items available within its respective dataset. Similar sensitivity analyses were carried out in the construction of the internalizing problems scale discussed below.

Timing of Variables Collection

The timing of variables collection is shown by age and birth cohort in Figure 2. Black X's indicate that coverage for a given measure is available for the indicated cohort and age group. Behavioral skills (including externalizing problems, self-regulation problems, social problems, and internalizing problems) are collected in 1988 at ages 4 (1984 birth cohort) and 5 (1983 birth cohort), and in 1990 at ages 4 (1986 birth cohort) and 5 (1985 birth cohort). Similar patterns of data collection hold for household income, family structure, parental conflict and parenting, educational expectations, and ear infection or asthma diagnosis by the present age, each of which is measured concurrently with behavior, as discussed below. Birth weight, gestation time, mother's education, family structure, and mother's age at birth are collected in 1984 for the 1983 and 1984 birth cohorts and in 1986 for the 1985 and 1986 birth cohorts. PPVT score is collected in 1986 at ages 2 and 3 for the 1984 and 1983 birth cohorts, respectively, and in 1988 for the 1986 and 1985 birth cohorts.

Gender Differences in Means of Predictor Variables

There are no statistically significant differences in boys' vs. girls' exposure to parenting styles (maternal harshness, positive discipline and warmth, or cognitive support). But, boys are exposed to significantly higher levels of parental conflict than girls at age 4 (t=3.55), which could be because, in the 1980s, biological fathers were more likely to remain in the household if they had a son than a daughter (t=2.99). Girls experience greater single mothering at age 4 (t=-2.12). There are no statistically significant differences by gender in mothers' years of schooling at the birth of the child, household income at age 4, odds of married biological parents at age 4, cohabiting parents at age 4, or the presence of a social father at age 4. There also are few statistically significant differences by gender in demographic and health context, except that boys on average weigh 0.28 pounds

(t=5.27) more than girls at birth and have slightly higher odds of asthma diagnosis by age 4 (t=2.89).

Table A.1: Means and Standard Deviations of Variables Used in the Analyses, by Gender

	Females (N=867)		Males (N=901)		Raw Item Range	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Min	Max
Educational Attainment						
High School Completion	0.806	0.395	0.736	0.441	0	1
Four-Year College Completion	0.239	0.426	0.166	0.373	0	1
Years of Schooling Completed	13.023	2.397	12.342	2.308	1	21
Behavior Problems Scales (Ages 10-11)						
Self-Regulation Problems	5.494	1.670	6.378	2.081	3	9
Social Problems	4.934	1.264	5.317	1.554	4	12
Externalizing Behavior Problems	7.770	1.930	8.624	2.396	6	18
Behavior Problems Scales (Ages 4-5)						
Self-Regulation Problems	5.941	1.638	6.411	1.793	3	9
Social Problems	5.106	1.268	5.401	1.419	4	12
Externalizing Behavior Problems	8.299	1.982	8.888	2.177	6	18
Educational Expectations						
Of Mother for Child at Ages 8-9	3.482	1.026	3.309	1.082	0	6
Of Child for Him/herself at Ages 8-9	3.825	1.137	3.703	1.152	0	6
Family Dynamics (Age 4)						
Parental Conflict Scale	2.019	0.518	2.099	0.530	1	4
Parental Harshness Scale	1.275	0.621	1.289	0.590	0	2
Positive Discipline and Warmth Scale	1.977	1.051	1.967	1.089	0	4
Cognitive Support Scale	1.412	1.133	1.330	1.080	0	5
Structural Factors Affecting Childhood						
Mother's Years of Schooling at Birth	11.655	2.157	11.778	2.076	0	20
Household Income at Age 4 (/25,000)	1.161	0.970	1.155	0.920	0	7.347
Father Absent at Birth	0.301	0.459	0.248	0.432	0	1
Biological Parents Married at Age 4	0.536	0.499	0.575	0.494	0	1
Biological Parents Cohabiting at Age 4	0.117	0.321	0.115	0.319	0	1
Single Mother at Age 4	0.321	0.467	0.280	0.449	0	1
Social Father at Age 4	0.027	0.161	0.030	0.171	0	1
Demographic Factors and Health Context						
Mother's Age at Birth	23.316	2.549	23.460	2.432	18	29
PPVT Score	0.022	0.949	-0.021	0.971	-4.037	3.644
Internalizing Score	3.079	1.684	3.139	1.644	0	4
Birth Weight in Pounds	7.089	1.300	7.373	1.390	0.823	16.750
Gestation Time in Weeks	38.769	2.254	38.726	2.302	24	46.514
Birth Order	1.900	1.021	1.940	1.005	1	7
Asthma Diagnosis by Age 4	0.044	0.205	0.073	0.261	0	1
Ear Infection Diagnosis by Age 4	0.011	0.104	0.015	0.122	0	1
White or Asian	0.509	0.500	0.531	0.499	0	1
Black	0.307	0.461	0.276	0.447	0	1
Hispanic	0.183	0.387	0.192	0.394	0	1
Born 1983	0.306	0.461	0.279	0.448	0	1
Born 1984	0.245	0.430	0.253	0.435	0	1
Born 1985	0.220	0.414	0.249	0.432	0	1
Born 1986	0.229	0.420	0.219	0.414	0	1

Table A.2: Demographic, Health, Family, and Behavioral Factors as Predictors of H.S. Completion, and as Mechanisms to Help Explain the Gender Gap in H.S. Completion (Reporting Odds Ratios)

	(1)	(2)	(3)	(4)	(5)	(5)	(6)	(7a)	(7b)	(7c)	(8a)	(8b)	(8c)
Gender Gap:								(Self-Reg. ages 4-5)	(Social ages 4-5)	(Extern. ages 4-5)	(Self-Reg. ages 10-11)	(Social ages 1-11)	(Extern. ages 10-11)
Male	0.643***	0.652***	0.654***	0.658***	0.647**	0.665***	0.665***	0.731*	0.757*	0.755*	0.751*	0.788*	0.779*
	(0.077)	(0.074)	(0.078)	(0.078)	(0.097)	(0.078)	(0.081)	(0.091)	(0.095)	(0.096)	(0.100)	(0.097)	(0.099)
Demographic & Health Context and Internalizing Behaviors:													
Internalizing Behavior Score[1]		0.944	0.969	0.967	Omitted	0.959	0.985	0.995	0.993	0.999	1.027	1.052	1.050
		(0.061)	(0.063)	(0.063)		(0.063)	(0.066)	(0.067)	(0.069)	(0.070)	(0.081)	(0.083)	(0.082)
Mother's Age at Birth of Child[1]		1.124***	1.085**	1.083**	1.137*	1.083**	1.082**	1.077*	1.075*	1.073*	1.062*	1.066*	1.064*
		(0.031)	(0.031)	(0.031)	(0.059)	(0.031)	(0.031)	(0.031)	(0.032)	(0.032)	(0.031)	(0.031)	(0.031)
PPVT Score[1]		1.243**	1.164+	1.169+	1.280+	1.189*	1.131	1.134	1.151+	1.159+	1.063	1.063	1.063
		(0.097)	(0.093)	(0.094)	(0.173)	(0.096)	(0.093)	(0.094)	(0.097)	(0.098)	(0.091)	(0.091)	(0.090)
Birth weight[1]		0.942	0.923	0.920	0.902	0.925	0.919	0.923	0.924	0.920	0.936	0.930	0.932
		(0.051)	(0.050)	(0.050)	(0.091)	(0.051)	(0.051)	(0.051)	(0.052)	(0.052)	(0.051)	(0.051)	(0.051)
Gestation[1]		1.017	1.024	1.024	1.035	1.025	1.024	1.023	1.021	1.024	1.017	1.017	1.018
		(0.034)	(0.035)	(0.035)	(0.063)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.037)	(0.038)	(0.038)
Birth Order		0.669***	0.733***	0.733***	0.753*	0.725***	0.734***	0.742***	0.745***	0.742***	0.758***	0.764***	0.760***
		(0.040)	(0.046)	(0.046)	(0.087)	(0.047)	(0.047)	(0.048)	(0.049)	(0.049)	(0.051)	(0.051)	(0.051)
Asthma Diagnosis by Age 4		0.967	0.977	0.963	0.810	0.979	0.980	0.990	0.935	0.979	0.986	0.990	0.987
		(0.215)	(0.219)	(0.216)	(0.322)	(0.221)	(0.222)	(0.226)	(0.212)	(0.224)	(0.236)	(0.237)	(0.236)
Ear Infection Diagnosis by Age 4		4.230+	4.228+	4.322*	7.180+	4.535*	4.460*	4.777*	4.715*	4.732*	6.482+	6.105+	6.267+
		(3.131)	(3.137)	(3.212)	(7.390)	(3.376)	(3.323)	(3.602)	(3.562)	(3.578)	(6.456)	(6.085)	(6.240)
Black (ref=White or Asian)		1.401*	1.406*	1.427*	1.446	1.378+	1.265	1.263	1.262	1.257	1.296	1.295	1.286
		(0.219)	(0.225)	(0.244)	(0.454)	(0.237)	(0.221)	(0.222)	(0.225)	(0.225)	(0.234)	(0.231)	(0.230)
Hispanic (ref=White or Asian)		1.042	1.180	1.175	1.362	1.171	1.066	1.072	1.071	1.074	1.023	1.003	1.008
		(0.164)	(0.190)	(0.190)	(0.382)	(0.190)	(0.176)	(0.178)	(0.180)	(0.181)	(0.174)	(0.168)	(0.170)
Born 1984 (ref=born 1983)		1.102	1.108	1.115	0.985	1.130	1.129	1.156	1.151	1.145	1.005	0.977	0.986
		(0.180)	(0.182)	(0.184)	(0.324)	(0.194)	(0.195)	(0.201)	(0.204)	(0.204)	(0.185)	(0.180)	(0.181)
Born 1985 (ref=born 1983)		1.067	1.039	1.038	1.135	1.044	1.042	1.078	1.054	1.061	0.948	0.926	0.931
		(0.178)	(0.175)	(0.175)	(0.400)	(0.189)	(0.190)	(0.198)	(0.197)	(0.199)	(0.173)	(0.170)	(0.169)
Born 1986 (ref=born 1983)		1.073	0.998	1.016	1.127	1.018	1.036	1.047	1.050	1.049	1.003	0.995	0.998
		(0.196)	(0.184)	(0.188)	(0.430)	(0.196)	(0.201)	(0.205)	(0.209)	(0.209)	(0.203)	(0.201)	(0.201)
Family Structure & Economic Resources:													
Mother's Years of Schooling[1]			1.117***	1.120***	1.129*	1.121***	1.095**	1.096**	1.095**	1.095**	1.099*	1.092*	1.091*
			(0.036)	(0.036)	(0.070)	(0.036)	(0.037)	(0.037)	(0.038)	(0.038)	(0.044)	(0.044)	(0.044)
Income[1]			1.219*	1.170+	1.120	1.178+	1.134	1.145	1.143	1.149	1.004	1.005	1.005
			(0.105)	(0.107)	(0.161)	(0.109)	(0.104)	(0.106)	(0.106)	(0.107)	(0.004)	(0.004)	(0.004)
Father Absence at Child's Birth				1.154	0.809	1.144	1.183	1.188	1.260	1.265	1.245	1.249	1.252
				(0.191)	(0.269)	(0.192)	(0.200)	(0.202)	(0.218)	(0.220)	(0.222)	(0.221)	(0.223)
Social Father at Age 4 (ref=married or				0.874	2.655	0.877	0.899	0.898	0.865	0.873	0.911	0.909	0.911
cohabiting at 4)				(0.309)	(2.334)	(0.310)	(0.320)	(0.324)	(0.311)	(0.314)	(0.316)	(0.312)	(0.313)
Single Mother at Age 4 (ref=married or				0.775+	1.065	0.784	0.780	0.805	0.799	0.807	0.789	0.791	0.793
cohabiting at 4)				(0.118)	(0.546)	(0.120)	(0.120)	(0.125)	(0.126)	(0.127)	(0.129)	(0.129)	(0.129)
Interpersonal Family Behaviors:													
Parental Conflict Score					0.811	1.194	1.194	1.188	1.205	1.212	1.246	1.247	1.259
					(0.163)	(0.199)	(0.204)	(0.207)	(0.207)	(0.210)	(0.190)	(0.189)	(0.193)
Maternal Harshness Score					1.011	0.967	0.964	0.973	0.969	0.984	0.913	0.916	0.921
					(0.177)	(0.101)	(0.101)	(0.103)	(0.104)	(0.106)	(0.099)	(0.097)	(0.098)
Maternal Discipline and Warmth Score					0.936	0.941	0.938	0.930	0.944	0.935	0.985	0.992	0.992
					(0.103)	(0.058)	(0.059)	(0.058)	(0.061)	(0.060)	(0.065)	(0.065)	(0.065)
Maternal Cognitive Support Score					0.906	0.949	0.944	0.946	0.945	0.947	0.937	0.941	0.937
					(0.092)	(0.057)	(0.057)	(0.058)	(0.058)	(0.059)	(0.059)	(0.059)	(0.059)
Educational Expectations:													
Mother's Educational Expectations of					1.169	Omitted	1.248***	1.237**	1.194**	1.204**	1.216*	1.216**	1.216**
Child[1]					(0.131)		(0.081)	(0.081)	(0.081)	(0.082)	(0.092)	(0.089)	(0.090)
Child's Educational Expectations of Self[1]					0.970	Omitted	1.040	1.035	1.047	1.040	1.019	1.029	1.026
					(0.101)		(0.060)	(0.061)	(0.062)	(0.062)	(0.061)	(0.062)	(0.063)
Behavior Problems:													
Externalizing Probs./Self-Reg. Probs./								0.946*	0.906*	0.929**	0.978	0.941	0.962
Social Probs. Score, Ages 4-5[1]								(0.065)	(0.074)	(0.050)	(0.041)	(0.050)	(0.033)
Externalizing Probs./Self-Reg. Probs./											0.916*	0.914*	0.914*
Social Probs. Score, Ages 10-11[1]											(0.046)	(0.062)	(0.040)
Constant	4.183***	7.513***	6.295***	6.604***	0.062	6.055***	2.514+	2.561+	2.558+	2.519+	0.721	0.844	0.818
	(0.352)	(1.442)	(1.230)	(1.323)	(0.164)	(2.623)	(1.260)	(1.288)	(1.299)	(1.284)	(1.074)	(1.246)	(1.215)
Cum. % of Gender Gap Explained: [2]	--	2.521	3.081	4.202	20.516	6.162	6.162	24.650	31.933	31.373	30.252	40.616	38.095
N	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752

Robust standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Results based on 20 imputed datasets.

[1]Variable centered at the sample-specific mean. See Appendix A.1 for uncentered means.

[2]The cumulative percent of the gender gap explained = $((e^{\beta baseline} - 1) - (e^{\beta model\ m} - 1))/(e^{\beta baseline} - 1)$, where baseline refers to the baseline model (1) and m refers to a given subsequent, nested model (2 through 8).

Table A.3: Demographic, Health, Family, and Behavioral Factors as Predictors of 4-Year College Completion, and as Mechanisms to Help Explain the Gender Gap in 4-Year College Completion (Reporting Odds Ratios)

	(1)	(2)	(3)	(4)	(5)	(5)	(6)	(7a)	(7b)	(7c)	(8a)	(8b)	(8c)
Gender Gap:								(Self-Reg. ages 4-5)	(Social ages 4-5)	(Extern. ages 4-5)	(Self-Reg. ages 10-11)	(Social ages 10-11)	(Extern. ages 10-11)
Male	0.547***	0.550***	0.558***	0.577***	0.551***	0.584***	0.592***	0.668**	0.643**	0.650**	0.681**	0.638**	0.648**
	(0.068)	(0.073)	(0.072)	(0.072)	(0.079)	(0.074)	(0.079)	(0.090)	(0.088)	(0.089)	(0.096)	(0.090)	(0.092)
Demographic & Health Context and Internalizing Behaviors:													
Internalizing Behavior Score[1]		0.715***	0.732***	0.734***	Omitted	0.745***	0.746**	0.771**	0.748**	0.755**	0.848	0.811+	0.830+
		(0.059)	(0.063)	(0.063)		(0.065)	(0.068)	(0.070)	(0.070)	(0.070)	(0.089)	(0.088)	(0.089)
Mother's Age at Birth of Child[1]		1.199***	1.091**	1.088**	1.099+	1.086**	1.086*	1.093**	1.081*	1.082*	1.067+	1.067+	1.068+
		(0.034)	(0.034)	(0.034)	(0.059)	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)	(0.041)	(0.041)	(0.041)
PPVT Score[1]		1.598***	1.391***	1.392***	1.136	1.347***	1.232**	1.215*	1.238**	1.237**	1.189*	1.219*	1.214*
		(0.112)	(0.104)	(0.104)	(0.120)	(0.102)	(0.097)	(0.096)	(0.098)	(0.098)	(0.095)	(0.097)	(0.096)
Birth weight[1]		1.033	0.990	0.982	1.065	0.981	0.974	0.984	0.991	0.989	1.015	0.999	1.005
		(0.060)	(0.061)	(0.061)	(0.103)	(0.061)	(0.062)	(0.062)	(0.064)	(0.064)	(0.065)	(0.064)	(0.064)
Gestation[1]		1.009	1.014	1.016	1.001	1.016	1.017	1.011	1.010	1.010	0.998	0.999	0.999
		(0.036)	(0.038)	(0.039)	(0.057)	(0.039)	(0.040)	(0.040)	(0.040)	(0.040)	(0.039)	(0.039)	(0.039)
Birth Order		0.697***	0.862+	0.862+	0.799+	0.861+	0.874	0.867+	0.889	0.887	0.894	0.906	0.904
		(0.054)	(0.072)	(0.072)	(0.102)	(0.073)	(0.076)	(0.074)	(0.078)	(0.077)	(0.085)	(0.087)	(0.087)
Asthma Diagnosis by Age 4		0.687	0.723	0.708	0.934	0.672	0.707	0.722	0.730	0.747	0.624	0.619	0.619
		(0.199)	(0.212)	(0.208)	(0.520)	(0.199)	(0.213)	(0.216)	(0.220)	(0.225)	(0.211)	(0.209)	(0.209)
Ear Infection Diagnosis by Age 4		1.061	1.083	1.151	1.543	1.086	0.927	0.941	0.892	0.895	0.861	0.808	0.805
		(0.468)	(0.503)	(0.538)	(0.756)	(0.514)	(0.461)	(0.471)	(0.446)	(0.446)	(0.466)	(0.438)	(0.436)
Black (ref=White or Asian)		0.925	0.798	0.839	0.453*	0.902	0.731	0.754	0.747	0.747	0.727	0.720	0.718
		(0.154)	(0.140)	(0.156)	(0.149)	(0.170)	(0.143)	(0.146)	(0.147)	(0.147)	(0.157)	(0.152)	(0.153)
Hispanic (ref=White or Asian)		0.907	1.038	1.050	0.907	1.051	0.852	0.896	0.860	0.862	0.864	0.854	0.857
		(0.152)	(0.183)	(0.185)	(0.262)	(0.187)	(0.156)	(0.163)	(0.159)	(0.160)	(0.168)	(0.164)	(0.165)
Born 1984 (ref=born 1983)		0.802	0.778	0.783	0.918	0.691+	0.728	0.787	0.756	0.751	0.810	0.776	0.781
		(0.146)	(0.146)	(0.147)	(0.331)	(0.135)	(0.147)	(0.156)	(0.153)	(0.152)	(0.164)	(0.156)	(0.158)
Born 1985 (ref=born 1983)		0.758	0.719+	0.718+	0.719	0.624*	0.654*	0.717	0.681+	0.675+	0.782	0.745	0.750
		(0.137)	(0.134)	(0.134)	(0.253)	(0.127)	(0.136)	(0.147)	(0.143)	(0.141)	(0.172)	(0.161)	(0.163)
Born 1986 (ref=born 1983)		0.771	0.656*	0.661*	0.595	0.574**	0.616*	0.650*	0.636*	0.632*	0.698+	0.655*	0.665+
		(0.147)	(0.131)	(0.132)	(0.214)	(0.120)	(0.133)	(0.138)	(0.138)	(0.137)	(0.151)	(0.140)	(0.143)
Family Structure & Economic Resources:													
Mother's Years of Schooling[1]			1.402***	1.403***	1.387***	1.390***	1.310***	1.280***	1.315***	1.313***	1.270***	1.269***	1.263***
			(0.060)	(0.061)	(0.110)	(0.061)	(0.059)	(0.055)	(0.059)	(0.059)	(0.066)	(0.065)	(0.065)
Income[1]			1.234**	1.189*	0.947	1.172+	1.115	1.136	1.134	1.135	1.000	1.000	1.000
			(0.096)	(0.097)	(0.110)	(0.097)	(0.094)	(0.096)	(0.097)	(0.097)	(0.001)	(0.001)	(0.001)
Father Absence at Child's Birth				0.999	0.817	1.046	1.140	1.120	1.141	1.149	1.083	1.057	1.071
				(0.203)	(0.352)	(0.214)	(0.242)	(0.235)	(0.243)	(0.245)	(0.236)	(0.227)	(0.231)
Social Father at Age 4 (ref=married or cohabiting at 4)				0.522	1.045	0.525	0.570	0.569	0.558	0.557	0.782	0.739	0.745
				(0.250)	(0.770)	(0.253)	(0.283)	(0.282)	(0.278)	(0.277)	(0.383)	(0.358)	(0.361)
Single Mother at Age 4 (ref=married or cohabiting at 4)				0.802	0.792	0.789	0.756	0.794	0.762	0.764	0.834	0.841	0.837
				(0.145)	(0.412)	(0.144)	(0.141)	(0.147)	(0.143)	(0.144)	(0.158)	(0.159)	(0.158)
Interpersonal Family Behaviors:													
Parental Conflict Score					0.959	0.905	0.853	0.848	0.835	0.839	0.945	0.940	0.946
					(0.224)	(0.151)	(0.154)	(0.149)	(0.151)	(0.151)	(0.153)	(0.150)	(0.151)
Maternal Harshness Score					0.693*	0.838	0.839	0.845	0.839	0.847	0.828+	0.810+	0.813+
					(0.121)	(0.093)	(0.095)	(0.094)	(0.095)	(0.097)	(0.093)	(0.091)	(0.092)
Maternal Discipline and Warmth Score					1.220+	1.201**	1.195*	1.162*	1.193*	1.191*	1.185*	1.189*	1.189*
					(0.132)	(0.084)	(0.086)	(0.083)	(0.086)	(0.086)	(0.085)	(0.084)	(0.085)
Maternal Cognitive Support Score					1.063	1.053	1.045	1.027	1.045	1.045	1.008	1.017	1.013
					(0.095)	(0.066)	(0.066)	(0.065)	(0.067)	(0.067)	(0.070)	(0.069)	(0.069)
Educational Expectations:													
Mother's Educational Expectations of Child[1]					1.883***	Omitted	1.528***	1.533***	1.522***	1.520***	1.450***	1.498***	1.487***
					(0.233)		(0.129)	(0.128)	(0.128)	(0.129)	(0.130)	(0.133)	(0.132)
Child's Educational Expectations of Self[1]					1.275*	Omitted	1.338***	1.328***	1.343***	1.335***	1.224**	1.233**	1.236**
					(0.134)		(0.101)	(0.099)	(0.102)	(0.102)	(0.092)	(0.094)	(0.094)
Behavior Problems:													
Externalizing Probs./Self-Reg. Probs./ Social Probs. Score, Ages 4-5[1]								0.912*	0.928*	0.922*	1.012	1.034	1.032
								(0.042)	(0.038)	(0.038)	(0.059)	(0.072)	(0.048)
Externalizing Probs./Self-Reg. Probs./ Social Probs. Score, Ages 10-11[1]											0.756***	0.860*	0.830**
											(0.060)	(0.074)	(0.051)
Constant	0.386***	0.747	0.474***	0.509**	0.000***	0.519	0.041***	0.043***	0.041***	0.041***	0.049+	0.032+	0.035+
	(0.029)	(0.154)	(0.104)	(0.114)	(0.000)	(0.241)	(0.025)	(0.026)	(0.025)	(0.025)	(0.088)	(0.057)	(0.062)
Cum. % of Gender Gap Explained: [2]	--	0.662	2.428	6.623	20.516	8.168	9.934	26.711	21.192	22.737	29.581	20.088	22.296
N	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752

Robust standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Results based on 20 imputed datasets.

[1]Variable centered at the sample-specific mean. See Appendix A.1 for uncentered means.

[2]The cumulative percent of the gender gap explained = $((e^{\beta baseline} - 1) - (e^{\beta model\ m} - 1))/(e^{\beta baseline} - 1)$, where baseline refers to the baseline model (1) and m refers to a given subsequent, nested model (2 through 8).

Table A.4: Demographic, Health, Family, and Behavioral Factors as Predictors of Years of Schooling, and as Mechanisms to Help Explain the Gender Gap in Years of Schooling (Reporting OLS Coefficients)

	(1)	(2)	(3)	(4)	(5)	(6)	(7a) (Self-Reg. ages 4-5)	(7b) (Social ages 4-5)	(7c) (Extern. ages 4-5)	(8a) (Self-Reg. ages 10-11)	(8b) (Social ages 10-11)	(8c) (Extern. ages 10-11)
Gender Gap:												
Male	-0.680***	-0.634***	-0.630***	-0.629***	-0.612***	-0.563***	-0.448***	-0.475***	-0.458***	-0.431***	-0.465***	-0.433***
	(0.114)	(0.106)	(0.103)	(0.102)	(0.103)	(0.101)	(0.100)	(0.102)	(0.100)	(0.102)	(0.099)	(0.100)
Demographic & Health Context and Internalizing Behaviors:												
Internalizing Behavior Score[1]		-0.282***	-0.233***	-0.228***	-0.220***	-0.185***	-0.159**	-0.188***	-0.174**	-0.102	-0.147*	-0.118+
		(0.057)	(0.056)	(0.056)	(0.056)	(0.055)	(0.054)	(0.057)	(0.057)	(0.063)	(0.065)	(0.065)
Mother's Age at Birth of Child[1]		0.188***	0.111***	0.106***	0.105***	0.101***	0.097***	0.096***	0.099***	0.092***	0.089***	0.091***
		(0.025)	(0.026)	(0.026)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
PPVT Score[1]		0.556***	0.413***	0.417***	0.409***	0.318***	0.305***	0.323***	0.323***	0.262***	0.281***	0.274***
		(0.067)	(0.066)	(0.066)	(0.067)	(0.067)	(0.066)	(0.067)	(0.067)	(0.063)	(0.063)	(0.063)
Birth weight[1]		0.008	-0.028	-0.039	-0.039	-0.047	-0.043	-0.038	-0.043	0.015	0.004	0.007
		(0.049)	(0.048)	(0.048)	(0.048)	(0.048)	(0.047)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
Gestation[1]		-0.017	-0.007	-0.005	-0.004	-0.007	-0.007	-0.009	-0.007	-0.018	-0.017	-0.018
		(0.030)	(0.030)	(0.029)	(0.030)	(0.030)	(0.029)	(0.030)	(0.030)	(0.028)	(0.029)	(0.028)
Birth Order		-0.418***	-0.227***	-0.227***	-0.228***	-0.197**	-0.189**	-0.180**	-0.185**	-0.229***	-0.215***	-0.218***
		(0.060)	(0.063)	(0.063)	(0.063)	(0.062)	(0.061)	(0.062)	(0.062)	(0.061)	(0.061)	(0.061)
Asthma Diagnosis by Age 4		0.013	0.049	0.027	0.015	0.046	0.056	0.060	0.068	-0.105	-0.108	-0.109
		(0.187)	(0.181)	(0.180)	(0.181)	(0.176)	(0.171)	(0.173)	(0.174)	(0.186)	(0.184)	(0.184)
Ear Infection Diagnosis by Age 4		-0.126	-0.121	-0.037	-0.043	-0.131	-0.098	-0.129	-0.125	-0.197	-0.246	-0.244
		(0.350)	(0.340)	(0.321)	(0.320)	(0.316)	(0.322)	(0.322)	(0.322)	(0.350)	(0.346)	(0.347)
Black (ref=White or Asian)		0.202	0.143	0.221	0.243+	0.058	0.052	0.052	0.067	0.216	0.200	0.202
		(0.133)	(0.130)	(0.139)	(0.139)	(0.142)	(0.138)	(0.141)	(0.141)	(0.148)	(0.147)	(0.147)
Hispanic (ref=White or Asian)		-0.135	0.039	0.042	0.048	-0.143	-0.113	-0.146	-0.137	-0.034	-0.044	-0.044
		(0.151)	(0.146)	(0.146)	(0.147)	(0.146)	(0.141)	(0.145)	(0.145)	(0.149)	(0.149)	(0.149)
Born 1984 (ref=born 1983)		-0.267+	-0.263+	-0.251	-0.305+	-0.276+	-0.264+	-0.250	-0.265+	-0.204	-0.234	-0.231
		(0.160)	(0.157)	(0.157)	(0.163)	(0.160)	(0.156)	(0.159)	(0.159)	(0.159)	(0.158)	(0.159)
Born 1985 (ref=born 1983)		-0.364*	-0.398*	-0.396*	-0.435*	-0.416*	-0.374*	-0.377*	-0.385*	-0.340*	-0.366*	-0.366*
		(0.164)	(0.159)	(0.160)	(0.171)	(0.168)	(0.164)	(0.168)	(0.168)	(0.162)	(0.162)	(0.162)
Born 1986 (ref=born 1983)		-0.280	-0.411*	-0.394*	-0.468**	-0.412*	-0.403*	-0.395*	-0.403*	-0.345*	-0.382*	-0.371*
		(0.171)	(0.167)	(0.167)	(0.173)	(0.170)	(0.164)	(0.169)	(0.169)	(0.158)	(0.158)	(0.158)
Family Structure & Economic Resources:												
Mother's Years of Schooling[1]			0.235***	0.235***	0.229***	0.177***	0.181***	0.178***	0.175***	0.180***	0.182***	0.177***
			(0.033)	(0.033)	(0.033)	(0.032)	(0.030)	(0.032)	(0.032)	(0.030)	(0.031)	(0.031)
Income[1]			0.288***	0.228***	0.222**	0.164*	0.177**	0.170**	0.173**	0.000	0.000	0.000
			(0.066)	(0.068)	(0.069)	(0.067)	(0.065)	(0.066)	(0.066)	(0.001)	(0.001)	(0.001)
Father Absence at Child's Birth				-0.017	0.006	0.080	0.058	0.088	0.081	0.028	0.033	0.035
				(0.145)	(0.145)	(0.144)	(0.140)	(0.143)	(0.144)	(0.138)	(0.139)	(0.139)
Social Father at Age 4 (ref=married or cohabiting at 4)				-0.749*	-0.706*	-0.603*	-0.609*	-0.619*	-0.626*	-0.531+	-0.566+	-0.555+
				(0.312)	(0.314)	(0.304)	(0.301)	(0.303)	(0.302)	(0.306)	(0.299)	(0.299)
Single Mother at Age 4 (ref=married or cohabiting at 4)				-0.307*	-0.308*	-0.313*	-0.275*	-0.291*	-0.294*	-0.297*	-0.305*	-0.299*
				(0.133)	(0.134)	(0.132)	(0.127)	(0.130)	(0.130)	(0.128)	(0.125)	(0.126)
Interpersonal Family Behaviors:												
Parental Conflict Score					0.165	0.138	0.128	0.120	0.127	0.199	0.192	0.202
					(0.129)	(0.134)	(0.133)	(0.133)	(0.134)	(0.143)	(0.142)	(0.143)
Maternal Harshness Score					-0.128	-0.129	-0.107	-0.134	-0.122	-0.172*	-0.197*	-0.185*
					(0.086)	(0.085)	(0.083)	(0.085)	(0.084)	(0.083)	(0.083)	(0.083)
Maternal Discipline and Warmth Score					0.063	0.056	0.031	0.049	0.047	0.076	0.080	0.081
					(0.058)	(0.057)	(0.056)	(0.057)	(0.057)	(0.052)	(0.052)	(0.052)
Maternal Cognitive Support Score					0.046	0.041	0.036	0.043	0.045	0.014	0.022	0.018
					(0.054)	(0.053)	(0.052)	(0.053)	(0.052)	(0.057)	(0.056)	(0.056)
Educational Expectations:												
Mother's Educational Expectations of Child[1]						0.372***	0.353***	0.365***	0.360***	0.358***	0.390***	0.378***
						(0.056)	(0.055)	(0.056)	(0.056)	(0.061)	(0.060)	(0.061)
Child's Educational Expectations of Self[1]						0.175***	0.162**	0.175***	0.167***	0.145**	0.154**	0.154**
						(0.051)	(0.050)	(0.051)	(0.051)	(0.049)	(0.049)	(0.049)
Behavior Problems:												
Externalizing Probs./Self-Reg. Probs./ Social Probs. Score, Ages 4-5[1]							-0.097**	-0.076+	-0.088***	-0.007	0.019	-0.002
							(0.031)	(0.041)	(0.027)	(0.037)	(0.044)	(0.029)
Externalizing Probs./Self-Reg. Probs./ Social Probs. Score, Ages 10-11[1]										-0.119**	-0.067+	-0.069*
										(0.042)	(0.031)	(0.033)
Constant	13.018***	13.869***	13.485***	13.588***	13.239***	11.343***	11.477***	11.380***	11.404***	10.764***	10.409***	10.591***
	(0.081)	(0.188)	(0.188)	(0.191)	(0.367)	(0.420)	(0.411)	(0.416)	(0.417)	(1.220)	(1.267)	(1.248)
Cum. % of Gender Gap Explained: [2]	--	6.765	7.353	7.500	10.000	17.647	34.118	30.147	32.647	36.618	31.618	36.324
N	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752	1,752

Robust standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Results based on 20 imputed datasets.

[1]Variable centered at the sample-specific mean. See Appendix A.1 for uncentered means.

[2]The cumulative percent of the gender gap explained = ($\beta_{baseline}$ - $\beta_{model\ m}$)/($\beta_{baseline}$), where baseline refers to the baseline model (1) and m refers to a given subsequent, nested model (2 through 8).

Figure A.1: 10th, 25th, 50th, 75th, and 90th Percentile Gender Gaps in Self-regulation and Social Problems in the Late 1980s

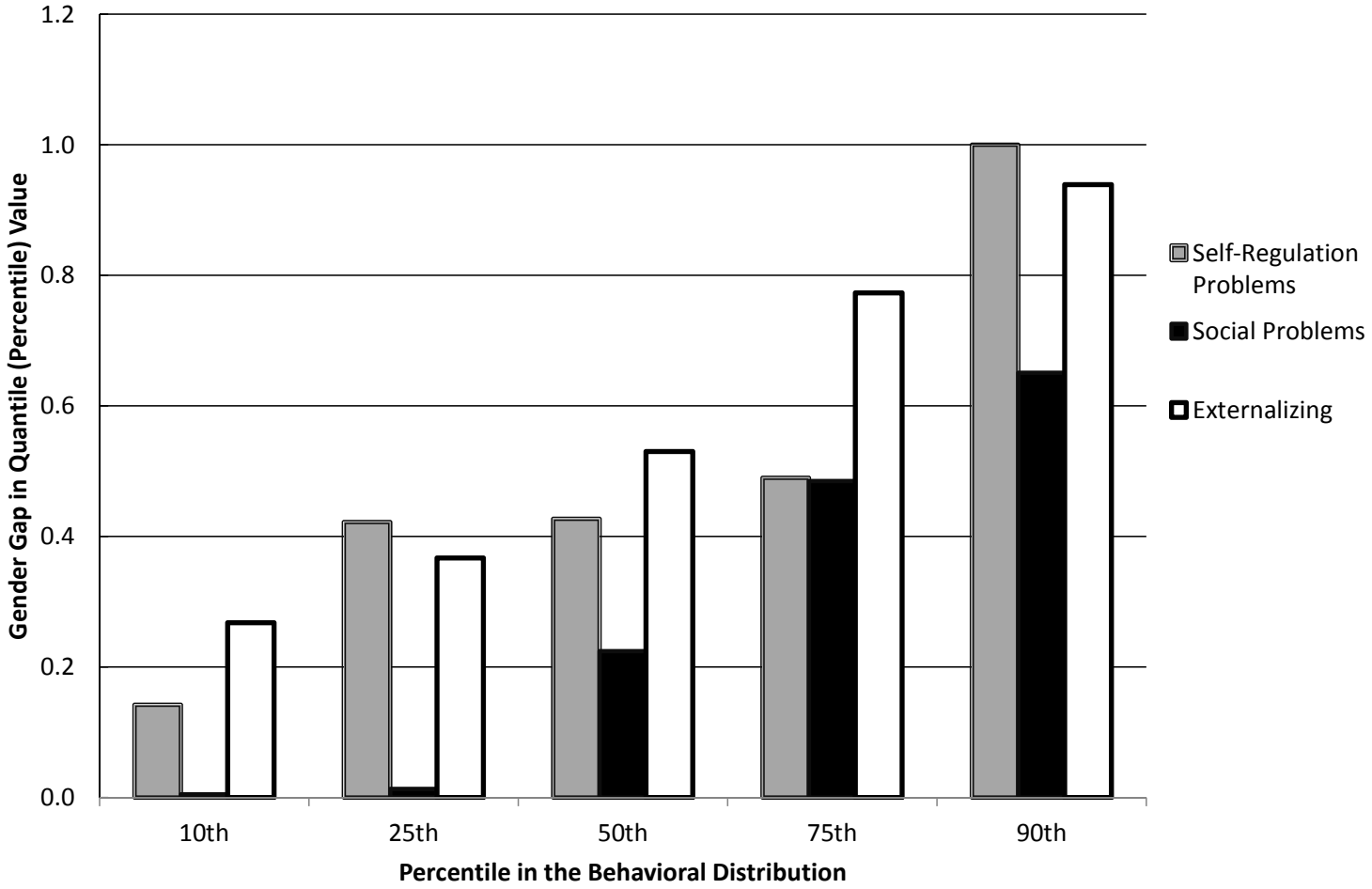


Figure A.2: 10th, 25th, 50th, 75th, and 90th Percentile Gender Gaps in Externalizing Problems in the Late 1980s Among Children in High vs. Low Parental Conflict Families and Single Mother vs. Two Parent Families