Social Class, Gender, and Children's Behavior Problems Across Two Decades

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Abstract

In 2006, American childhood attention deficit hyperactivity disorder (ADHD) prevalence was over 8 million. With rising income inequality, prevalence is higher and increasing faster among boys from families below 200% of the poverty line. Using two national samples of children born across two decades, this study examines changing perceptions of boys' attention and antisocial/aggressive symptomatology. Findings reveal that the gender gap in mothers' reports of children's behavior emerged even between the low-income (but not high-income) children with the lowest behavior problem ratings. Only a portion of this gap is explained by environmental changes in families and early childhood health, which disproportionately affect low-income boys. Strikingly, much more of the growing gap is explained by an increase in mothers' reports of the depression-linked internalizing behavior problems historically reported as higher among girls. Findings suggest the growing gap among low-income children's behavior problems is related to changing perceptions of behaviors.

1 Introduction

One of the most startling demographic shifts in recent decades is the widening gap in the family structures of the most- and least-educated Americans (McLanahan, 2004). Fifty years ago, the majority of American children grew up in families with two biological parents regardless of their parents' educational attainment. Today, parental possession of a four year bachelor of arts or sciences degree (henceforth "a college degree") is one of the most predictive factors of whether a child is born into and raised within a stable union, one with two biological parents living at home (Cherlin, 2011). Given the correlation between education and income (Sewell et al., 1970) and the tendency of Americans to marry within their educational bracket (Mare, 1991; Schwartz and Mare, 2005), the divergence in a child's chances of being born into a one- vs. two-parent household based on their parents' education can also be extended to an analysis based on parents' income (Carlson and England, 2011). The divergence in the economic, social, and cultural resources of children born to more- compared to less-educated parents is further reinforced by selection processes in which men and women with greater resources receive the most education and form stable unions in the first place.

Combined with the rise in women's higher educational attainment and employment rates over the past fifty years, the result is that children born to more-educated parents also have greater economic, social, and cultural resources (i.e., higher socioeconomic status, or SES).[1] The additional economic, social, and cultural resources provided by highly-educated mothers working outside the home allow parents to provide their children with quality health care, child care, education, safe neighborhoods, extracurricular activities, and lower-stress home environments (Morris et al., 2004). These resources together benefit children's cognitive and behavioral development (Becker, 1981).

Family resources, especially parental education, also are predictive of a variety of child health outcomes. These include low birth weight, pre-term birth status, and early childhood asthma (Almqvist et al., 2005). Exposure to these risk factors set children up

[1] Some scholars have investigated whether the rise in paid work outside the home on the part of mothers in two-parent households who would have otherwise been home-makers decreases quality of parenting and/or parents' time with children, but this research has found limited support (Bianchi, 2000).

for a variety of additional disadvantages later on in life (Almqvist et al., 2005). As higher education has become less and less affordable for lower-income Americans and income inequality itself has risen, there also has been divergence in the early health outcomes of children by parents' education and family income. Pre-term birth, low birth weight, and asthma all are on the rise (Demissie et al., 2001; Horbar et al., 2002; CDC, 2007). The divergent socioeconomic trajectories of Americans and the dwindling of the middle class has meant that a wider cross section of children (i.e., the children who once would have been protected because of their families middle class status) are raised in low SES families and exposed to unstable family environments and health risks in early childhood (Almqvist et al., 2005).

It is relatively well-documented that these socioeconomic, family, and health changes have dramatic implications for the behavioral and cognitive development of children raised in low, compared to high, SES families (Dawson, 1991; Hack et al., 1995). What is much less clear, however, is how the divergence in family socioeconomic resources in recent decades affects the evolution of the long-standing, gender gap in early childhood behavioral development. This is the first question addressed in this chapter.

The second question of this chapter is whether rising numbers of single parent households and early childhood health problems serve as proximate determinants, or mechanisms, linking divergent socioeconomic trajectories to the growing gender gap in externalizing behavior problems. I first test whether the growth of the gender gap in behavior problems is concentrated among the poorest children. I then test whether gender differences in exposure to or the effects of these early family structure and health factors explain the growth of the gender gap in behavior problems. For example, the underlying mechanisms through which father absence may have disproportionately negative effects for boys' behavioral development remain unclear. When exposed to the material hardship that accompanies many single-earner households, even the best-rated boys from low SES families may externalize more than girls from low SES families. Or, father absence may reflect the selection regime in which less-educated parents are more likely to experience divorce or non-marital childbearing. Father absence also may reflect the potentially negative effects on boys' development of lacking a positive male role model (see Carlson (2006)).

Alternatively, the socioeconomic divergence in the gender gap in externalizing problems may be a result of social shifts in perceptions and/or reporting of behavior problems that do not reflect a true change in children's (particularly boys') behavior (Mayes et al., 2009). I do not directly test this hypothesis here. However, if this is the case, I would not expect the population shifts investigated here to explain the anticipated socioeconomic divergence of the gender gap in parents' reports of boys' and girls' externalizing problems.[2] One way in which to indirectly begin to examine this hypothesis with the use of survey data is to investigate whether mothers' reporting of another important behavior problem – "internalizing problems" – have risen more for boys than for girls. Internalizing problems are comprised of displays of sadness and anxiety, which are often linked to depression (Zill and West, 2001). Girls have historically had higher ratings of internalizing problems than boys (Zill and West, 2001). But, if boys are subjectively rated as exhibiting higher levels of behavior problems overall in recent decades, we may see a shift in reports of boys' internalizing problems as well. Reports of a shrinkage or closing of the female disadvantage in internalizing problems may then help explain some of the growth in the gender gap in boys' externalizing problems.

2 Links Between Family Socioeconomic Status and Child Behavior Problems: The Case of ADHD

The consequences of the socioeconomic divergence in family structure at a child's birth across recent decades appear clearly when examining trends in diagnosis of an early childhood behavioral disorder called attention deficit hyperactivity disorder (ADHD). ADHD is diagnosed based on physician assessments of children's externalizing problems (i.e., self-regulation problems and social problems) and other closely related behavior problems (Lange et al., 2010). As shown in Figure 1, ADHD diagnosis has been on the rise in recent decades (Boyle et al., 2011; Olfson et al., 2003). And, in addition to the overall

[2]The exception would be if changes in perceptions and/or reports of externalizing problems are associated with changes in families or health.

rise, recent years have seen a further divergence in ADHD diagnosed prevalence by SES. Figure 1 shows that lower SES children, whether based on income or parental educational attainment, have higher rates of ADHD diagnosed prevalence than do higher SES children.

[FIGURE 1 ABOUT HERE]

Over the past several years, the gap in ADHD diagnosed prevalence by SES has grown. By the 2006-2008 period, prevalence among children from families with household incomes under 200% of the poverty line or in which mothers did not hold a bachelor's degree was between 1.5 and 2.5 percentage points higher than among children from families making more than 200% of the poverty line or whose mothers had a college degree or higher. At the population level, ADHD diagnosed prevalence among children under 17 years was roughly 8.1 million in 2006 (CDC, 2013; ChildStats.gov, 2012). Therefore, between 122,000 and 203,000 more children from low-SES compared to high-SES families had received an ADHD diagnosis in 2006 (CDC, 2013; ChildStats.gov, 2012).[3]

3 Child Gender and Links Between Family Socioeconomic Status, Family Structure, Early Health, and Behavior Problems

Some research shows that growing inequality in socioeconomic resources and rising divorce, non-marital childbearing, and early childhood health disparities in recent decades have had more negative consequences for the behavioral (and cognitive) development of boys than girls (Alexander et al., 1997; Davies and Lindsay, 2004; Demo and Acock, 1988; Elsmen et al., 2004). For example, the prior chapter displayed the marked gender gap in ADHD diagnosis and in elementary school suspensions. I expect to see the socioeconomic divergence in ADHD diagnosis shown in Figure 1 also to be patterned by gender inequality.[4]

[3]Note that the seeming anomaly of the lower (and declining) prevalence among children whose mothers have less than a high school degree may be explained by factors surrounding access to health care to aid with costs associated with diagnosis and treatment (Ferguson, 2000). Because ADHD is physician-diagnosed, many of the poorest children may not have the medical coverage or other economic resources necessary for diagnosis.

[4]Due to data availability issues, Figure 1 is not shown by gender in addition to socioeconomic status.

Diagnosed ADHD prevalence may be higher for boys compared to girls in the same socioeconomic group because boys have higher levels of exposure to early health problems linked to ADHD diagnosis. Boys have higher rates of pre-term birth and are more likely to be diagnosed with asthma.[5]. Pre-term birth and asthma are associated with higher levels of both behavioral and cognitive development problems, in particular ADHD and related externalizing problem behaviors (Aylward, 2002; Blackman and Gurka, 2007; Luciana, 2003). It also is in part because boys may externalize more than girls in response to the same or even lower levels of exposure to some risk factors. Boys and girls have roughly equivalent exposure to father absence and lower levels of low birth weight. But, recent research shows that father absence has more negative consequences for the behavioral development of boys than girls (Harris and Morgan, 1991; Rossi and Rossi, 1990).[6] Research also shows that despite their lower prevalence, low birth weight boys externalize more than girls (Pharoah et al., 1994).

The rise in these family and health risk factors, combined with boys' greater exposure and/or more severe externalizing response, suggests we may see two population dynamics emerge across the two decades considered in this study. First, the gender gap may become more ubiquitous and deeply entrenched within a wider cross-section of socioeconomically disadvantaged children. In prior decades, the gender gap in externalizing problems may have existed between a more highly-selected group of low-SES boys and girls: those with the highest externalizing problems ratings relative to their same-gender, low-SES peers. But today, even the best-rated, boys from low-SES families may be perceived to or may actually exhibit worse behavior than the best-rated girls from low-SES families. Second, a larger proportion and a more socioeconomically advantaged cross-section of children may have become exposed to these family and health risks. This may lead to the appearance of a gender gap in externalizing problems among a more socioeconomically advantaged cross-section of boys and girls. The first aim of this study is to test these hypotheses.

[5]Boys' may be diagnosed with asthma at higher rates because they act out more than girls when they experience asthma symptoms. They therefore may be more likely to be taken to the doctor by parents or teachers for behavior and/or health problems

[6]Note, however, that a variety of literature does not find support for this hypothesis; see Carlson (2006) for one example.

Potential Mechanisms of A True Widening of the Gender Gap in Externalizing Problems: Trends in Families and Early Childhood Health by Social Class

Single Parent Families

Figure 2A shows that over the past several decades, there has been a persistent socioeconomic gradient in children's exposure to single parent households. Since at least the 1980s, children from the lowest income quartile (quartile 1) consistently have had higher exposure to rearing in single parent households than children from the top income quartile(s). Research shows this same trend extends to parental education: children whose primary care-giver has only a high school degree or some college consistently have had much higher exposure to rearing in a single parent household than children whose primary care-giver had a college degree (McLanahan, 2004).

Low Birth Weight

Figure 2B displays the time trend in rates of low birth weight by maternal educational attainment between 1995 and 2002.[7] Despite different baseline prevalences in 1995, Figure 2B reveals an overall rise in rates of low birth weight across all maternal education groups except for mothers with less than a high school degree. For children born to the least-educated mothers, rates of low birth weight were highest – roughly 9% in 1995 – and show a slight downward trend falling to just below 9% by 2002. In spite of this slight decline, mothers with less than a high school education continue to have low birth weight offspring at higher rates than mothers in every other educational group.

Pre-Term Birth

Figure 2B also shows a remarkably similar trend by maternal education level between low birth weight and pre-term birth status.[8] There has been an overall rise in levels of pre-term birth for all but the least-educated mothers (those without a high school degree). This has led to a slight convergence in the absolute magnitude of the maternal education

[7]Due to limitations in data availability for low birth weight by maternal education prior to 1995, Figure 2B focuses on this seven year period. However, there is not reason to suspect the trend would not extend back to the 1980s.

[8]As described above for low birth weight, data availability limit the time-frame for which information on pre-term by maternal education is available in a national sample. But, the pattern is expected to extend back to the 1980s.

gradient in pre-term birth, but pre-term birth continues to be patterned by socioeconomic disparities at higher overall levels of prevalence.

[FIGURE 2]

Figure 2D shows the pattern of low birth weight and pre-term birth status by income quantile in 1988. Figure 2D reveals that the absolute magnitude of the differences in low birth weight by income quartile are much larger than those in pre-term birth status, but both are patterned by income. Rates of pre-term and low birth weight are almost twice as high for the poorest compared to the richest children.[9]

Asthma

Figure 2C displays trends in lifetime asthma prevalence among children ages 3-17 years by poverty status for selected years between 1981 and 1998. Over this entire period, childhood lifetime asthma prevalence has been on the rise for across all socioeconomic groups. Lifetime asthma prevalence among children born into families earning less than the poverty line has increased faster than for children from families earning above the poverty line. By 1998, prevalence among children in poverty was 33% higher than among children from families not under the poverty line.[10]

Gender and Family and Health Risk Factors

Research suggests the above trends in families and health by SES are associated with different externalizing responses between boys and girls. In the case of pre-term and asthma, this in part may be because of boys' higher levels of exposure, as discussed in Chapter **??** (Ingemarsson, 2003; Weitzman et al., 1990; Zeitlin et al., 2002). Or, for

[9] Again, due to data limitations, pre-term and low birth weight by income quartile in a national sample of children were only available for a limited number of years.

[10] Appendix Figure A.1 also shows the socioeconomic gradient in childhood asthma prevalence by parental education. In 1981, lifetime asthma prevalence among children born to parents whose highest level of education was less than a high school degree was twice as high as for children born to parents with higher than a high school degree. Although this gap has shrunk in recent decades due to the overall rise in prevalence, children born to parents with less than a high school degree continued to have over 11% (or 1 percentage-point) higher prevalence than children born to parents with more than a high school degree. Unfortunately, limitations in published reporting of the educational gradient in asthma in the National Health Interview Survey prevent further disaggregation by college degree. However, the disparity by parental education is likely to be even larger if comparisons were available between the children of bachelor degree holders vs. high school dropouts.

certain factors, it is possible that boys externalize more than girls when exposed. Boys and girls are raised within single mother households at similar rates (Cooper et al., 2011). Low birth weight status is more common among girls than boys (Van Vliet et al., 2009). However, some research suggests boys externalize more than girls in response to these factors (Davies and Lindsay, 2004; Elsmen et al., 2004; Pharoah et al., 1994; Shaw et al., 1998). In the case of low birth weight, this may be because girls are on average 0.5 pounds lighter than boys at birth, whereas most thresholds for low birth weight are not gender-specific. As a result, more girls qualify as low birth weight when in fact their lower weight is less often indicative of developmental problems (Rothman et al., 2008).

Why the Gender Gap in Externalizing Problems May Have Spread

In past decades, parents may have reported lower levels of externalizing behavior problems for both boys and girls, leading to a smaller absolute gender gap in externalizing problems. Although the gender gap in externalizing problems appeared across socioeconomic groups in past decades (Deater-Deckard and Dodge, 1997; Gaub and Carlson, 1997; Hetherington et al., 1985; Lahey et al., 2007), the gap was likely to have been concentrated among the children of a given socioeconomic group with the highest externalizing problems scores (i.e., between the "worst-behaved" boys and girls in a given socioeconomic group).[11] There are a number of reasons for this hypothesis. In past decades, population prevalence of diagnosed ADHD was lower. Rates of school suspension were lower and there were fewer zero-tolerance policies in schools (Mendez, 2003). There was wider social acceptance of children's acting out behaviors and the idea that "boys will be boys" (Bertrand and Pan, 2011). With lower prevalence of the social, family, and health factors linked to externalizing problems, the long-standing externalizing problems gap was likely to have been concentrated among the worst-behaved children of their socioeconomic group.

In recent decades, however, awareness of behavioral disorders such as ADHD has increased. Zero-tolerance policies in daycares and schools as well as early childhood health problems and single parent households are on the rise. Together, these changes

[11] However, the gap was likely to exist at lower levels of externalizing problems for higher SES children.

may have slowly begun to erode the "boys will be boys" paradigm. The erosion of this paradigm may be most pronounced among the most socioeconomically disadvantaged boys. These are the boys who are least buffered from these social and health shifts. At the same time, as low birth weight, pre-term birth, early childhood chronic health problems, and single parent households become more common, they also become to some extent more widespread across socioeconomic groups (Branum and Schoendorf, 2002; Demissie et al., 2001; King and Bearman, 2011; McLanahan and Percheski, 2008). As exposure to these environmental and health risks increases, the growth of the externalizing problems gap may spread further across the behavioral distribution if boys continue to externalize disproportionately more than girls in response. That is, the gender gap is likely to show up between the best- as well as the worst-rated children. The gap is likely to be most pronounced among children from low-SES families for whom exposure to the risk factors discussed previously is greater.

4 Data and Measures

Data

This study relies on the comparison of two national samples of children followed from birth in the mid 1980s or in 2001, until at least kindergarten. Certain item about parents collected in the National Longitudinal Survey of Youth: 1979 (NLSY-79) are merged into the working sample of the NLSY-C. The second data source is the restricted-use version of the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B).

Both data sources contain detailed information on children's early health, cognitive and behavioral development, home environments, and parents' relationship statuses, social class, and demographic characteristics. This information draws from maternal interviews or surveys and, for certain items, interviewers' direct home observations or test administration. The structure of the data and the timing of data collection is shown by year, age and birth cohort in Figure 3. The X's indicate the chronological progression of each birth cohort from age 0 to age 5. The brackets detail timing of variables collection.

[FIGURE 3 ABOUT HERE]

Sample Restrictions: Children of the National Longitudinal Survey of Youth (NLSY-C)

The 1983-1986 birth cohorts of the NLSY-C are the best-suited for this study. Because the behavior problems of interest were not collected in the NLSY-C until 1986, the 1983-1986 cohorts are the earliest for whom behavior problems are available at ages 4 and 5 (for comparability with the ages at which measures are available in the ECLS-B). These cohorts also allow me to maximize the period between studies.[12]

The NLSY-C includes roughly 3,000 children born between 1983 and 1986, as shown in Table 1. Of the 3,000 NLSY-C children born between 1983-1986, 506 (19%) had siblings in the sample. Because quantile regression – the primary analytic strategy used in this study – does not permit the clustering of standard errors among siblings, I randomly selected one child from these families, for a total of roughly 2,600 children (a similar strategy is employed in Thomson et al. (1994)).Ultimately, behavior problem measures were available for roughly 2,000 of these children.

[TABLE 1 ABOUT HERE]

Sample Restrictions

Roughly 15-20 years later, the ECLS-B collected similar developmental and family information on a nationally-representative sample of about 11,000 babies born in 2001. Based on direct observations and parental interviews/surveys, the ECLS-B tracked children at 9 months, 2 years, 4 or 5 years (preschool), and 6 years (kindergarten), as shown in Figure **??**. ECLS-B mothers spanned the child-bearing ages at the birth of their child(ren) in 2001. For comparability across datasets, the ECLS-B sample was restricted to the roughly 6,100 children born to mothers aged 18-29 at their child's birth in 2001, as shown in Table 1.[13] Approximately 10% of the sample consisted of (oversampled) twin or higher order

[12] Note that the NLSY-C alone includes children born in the 2000s. However, reliance on the 2000s births would have introduced significant bias into the analysis due to maturation: the 2000s births in the NLSY-79 were to mothers much older and more economically and otherwise stable than those born in the 1980s.

[13] The mean age of childbearing increased from 24 to 27 years between 1983 and 2001 (Mathews and Hamilton, 2002). Restricting the ECLS-B sample to children born to mothers 18-29 years may have

births. Because the quantile regressions used in these chapters cannot cluster standard errors for siblings, I randomly selected one child per mother. This reduced my sample to approximately 5,700. Of these, externalizing problems at ages 4 or 5 were available for the roughly 4,600 children who comprise the working sample for the 2001 birth cohort.

Measures

The most significant challenge in variables creation was the identification of items that were directly comparable across datasets. This required the selection of items that were worded virtually identically, measured when children in both datasets were the same age, and collected from the same reporting party. Even though the ECLS-B collected information from teachers and daycare providers and through direct-observations, measures are constructed almost exclusively from maternal reports because this was the primary strategy deployed in the NLSY-C. The scales used here are commonly used in prior research. However, in some cases (e.g., externalizing behaviors and internalizing behaviors) the scales used here include fewer items than the full number available for a given construct. This is in order to ensure that scales are comprised of nearly identical measures collected at comparable ages across datasets, as discussed in detail below.

Dependent Variables

The dependent variable in this study is a summed index for externalizing problems. Externalizing problems at ages 4 or 5 is conceptualized as the sum of two component subscales: self-regulation problems and social problems, as shown in Table 2 (Peterson and Zill, 1986).[14] In both datasets, the externalizing problems index uses six items based on mother reports of the child's frequency of: (1) impulsiveness, (2) restlessness, (3) trouble getting along with/difficulty getting invited to play by other children, (4) destructiveness, (5) likability, and (6) temper.[15]

introduced selection bias into the sample. A robustness check in which mothers up through age 35 were included in the ECLS-B sample showed that the growth of the gender gap did not change much.

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

[15]Although most studies draw on a subset of the complete Pre-Kindergarten Behavioral Skills, 2nd Ed. (PKBS-2) scale, the full PKBS-2 externalizing problems scale consists of 27 items divided into

In the ECLS-B, mother reports of her child's frequency of exhibiting a given externalizing behavior are measured on a scale from 1(never) to 5(very often). In the NLSY-C, mother reports are measured on a scale of 1 ("rarely"), 2 ("sometimes"), and 3 ("often"). The ECLS-B items are rescaled from x=1 ("never") to x=5 ("very often") to 1 ("rarely") to 3 ("often") using two methods: (1) merging of extreme categories ("very often" with "often" and "never" with "rarely"), and; (2) a linear rescaling using the formula: x *.5 + .5. The resulting externalizing problems scales range from six to eighteen. The ECLS-B scale has a Cronbach's Alpha of 0.75; the NLSY-C, 0.70.[16] Because results did not differ substantively between the rescaling method, results from the first method – the merging of extreme categories – are reported throughout the paper.

One of the key issues with internal validity was comparability of externalizing problems items across datasets. These sensitivity analyses are discussed at the end of this chapter.

[TABLE 2 ABOUT HERE]

Key Predictor Variables

I differentiate between three broad sets of predictors: family socioeconomic and cultural resources, family structure, and early childhood health. Family socioeconomic and cultural resources include mother's years of schooling at time of child's birth and per capita household income at age 4 (in $1,000s), in 2011 dollars.[17] Family structure includes family composition at birth (a dummy for father absent at birth) and family composition at age 4 (indicators for single mother and social (i.e., non-biological, residential) father).

three subcategories indicated in Table 2 The subset of items used in the present externalizing problems scale includes at least one item from each of the three sub-categories. By sub-scale, these include: Self-centered/explosive: Wants all the attention, will not share, yells or screams when angry, must have his or her own way, defies parent, teacher or caregiver, has unpredictable behavior, is jealous of other children, is moody or temperamental, whines or complains; Attention problems/overactive: makes noises that annoy others, takes things away from other children, has difficulty concentrating or staying on task, disobeys rules, is restless and fidgety, and disrupts ongoing activities; Antisocial/aggressive: teases or makes fun of other children, is physically aggressive, seeks revenge against others, and calls people names. All items are based on maternal report.

[16]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 PKBS-2 externalizing problems scale referenced in an earlier footnote, and also shown in Table 2.

[17]Per capita household income is constructed by dividing total household income (adjusted to 2011 dollars) by the number of people living in the household).

Early childhood health factors include indicators for pre-term birth (less than 37 weeks gestation), low birth weight (less than 5.5 pounds), and asthma diagnosis by age 4.[18]

Demographic Context and Internalizing Problems

Models adjust for a number of additional demographic, and behavioral factors. These include: mother's age at birth, the child's birth order, child's year of birth, child's internalizing behavior at ages 4 or 5 (discussed below), and, indicators for race/ethnicity, where analyses are not stratified. Internalizing is measured using maternal reports of child behavior on the two items that overlap across the Pre-Kindergarten Behavioral Skills, 2nd Edition (PKBS-2) and the CBCL's Behavior Problems Index (BPI): (1) child seems unhappy, sad, or depressed, and; (2) child is too fearful or anxious. These items were selected to cover both main components of internalizing (social withdrawal and anxiety/somatic problems) while also using items deemed to be valid measures of internalizing across both the PKBS-2 and BPI scales.[19] The internalizing items are scaled (and re-scaled, in the case of the 1-5 point ECLS-B items) in the same way as the items used to measure externalizing problems.

Cognitive Development

Prior research has focused on the relationship between behavioral problems and test scores (Buchmann et al., 2008; McLeod and Kaiser, 2004; Whitmire, 2010). But, it is not clear whether behavior predicts cognitive development, cognitive development predicts behavior, or both are the product of some other factor associated with both. Given this study's focus on behavior and the family and health factors that explain a growth in the gender gap in externalizing problems where it appears, the results presented in the main text do not control for cognitive development. However, supplementary analyses shown in the appendix material adjust for variation in cognitive ability without focusing on cognitive ability as a key pathway. A detailed description of the cognitive ability measure

[18]Pre-term is based on mother's report of weeks of gestation and birth weight in the first interview period after the child's birth.

[19]Models using all BPI internalizing items provided in the NLSY-C did not change substantive results.

used in the supplementary analyses is also included in the appendix material.

Treatment of Missing Data and Sensitivity Analyses

Multiple imputation of twenty datasets using the built-in multiple imputation procedure in Stata 11 was used to deal with item-missingness on key predictors (Royston, 2004). Externalizing problems at ages 4 or 5 (missing for roughly 24% of cases in the NLSY-C and 21% of cases in the ECLS-B) was 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 for which missingness was highest included: per capita household income at age 4 (22% in the NLSY-C and 33% in the ECLS-B) and cognitive support at age 4 (18% in the NLSY-C and 10% in the ECLS-B). The working sample consisted of 6,400 observations after carrying out the imputations (rounded to the nearest 100 for restricted data reporting purposes). 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), 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.

Internal and Predictive Validity Checks for the Behavioral Scales

After constructing comparable behavioral scales across datasets, I conducted a number of sensitivity analyses to examine the internal and predictive validity of these scales. Of the six items in the externalizing problems scale used in the present study, one item is not worded nearly as consistently across datasets as the other items. In the NLSY-C, this item asks mothers how frequently "the child has trouble getting along with other kids". In the ECLS-B, the comparable item asks mothers how frequently "the child is (not) invited to play by other children". As a robustness check on the internal validity of the externalizing problems scale, I estimated all models without this item, drawing instead on the other 5 items. Results did not change substantively.

In terms of external validity, I examined correlations between my constructed externalizing problems and internalizing problems scales and the complete scale provided in the respective dataset. I found high correlations between each of my constructed scales and the complete scale within each dataset from which comparable items were taken. For example, in the NLSY-C, the externalizing behaviors scale comes from the Behavior Problems Index, which is a subset of 10 items taken from the Achenbach Child Behavior Checklist. In the ECLS-B, the externalizing behaviors items come from the PKBS-2, and consist of a subset of 8 of the original 27 PKBS-2 externalizing problems items. Of the 10 externalizing items in the NLSY-C and the 8 in the ECLS-B, 6 align almost exactly. These six items provide coverage of each of the three subscales—self-centered/explosive, attention problems/overactive, and antisocial/aggressive—that are encompassed within the full PKBS-2 externalizing problems scale. Furthermore, each subscale is highly correlated (above .90) with the complete set of externalizing problems items available within its respective dataset.

5 Analytic Strategy

The results shown in the previous chapter indicate that ordinary least squares (OLS) regression is potentially misleading: the mean of a distribution may remain nearly constant over time, meanwhile the tails of a distribution may change dramatically. For example, a distribution may become bimodal with increasing clustering at both the low and high ends of behavior problem scores. When comparing males' and females' externalizing problems distributions, OLS regression may suggest a small or non-existent gender difference in the mean levels of behavior problem ratings, even if one distribution is becoming more bimodal and the other distribution increasingly clustered within a small range of externalizing problems scores. Quantile regression can identify patterns of growing gender difference in particular segments of the distribution. Here, there is reason to believe the gender difference, the gender gap, is becoming largest and most ubiquitous throughout the bottom half (i.e., the worst-behaved) of the externalizing problems distribution among low-SES children. As such, the present study draws on the same statistical method employed in the previous chapter: conditional quantile regression (see the previous chapter for details on this method).

The first set of conditional quantile regression analysis used in this study is descriptive in nature. It examines, within SES and time period, gender differences on the location of the 10th, 25th, 50th, 75th, and 90th percentiles of externalizing problems. Importantly, given this study's focus on gender-within-SES gaps in externalizing problems, the estimation sample is stratified by one of the two measures of SES (i.e., per capita household income or mother's educational attainment at the birth of the child). Quantiles are estimated for each gender and time period group using main effects indicators for male and for the 2001 cohort. An interaction term is estimated between male and the 2001 cohort indicators. The dummy variable for male identifies the magnitude of the gender gap in the 1980s cohorts. The dummy variable for the 2001 birth cohort (henceforth "the later time period") identifies the average difference in externalizing problems scores for females between the two cohorts. The interaction term between male and 2001 birth cohort identifies the change (i.e., the growth or shrinkage) in the gender gap between the 1980s and the 2001 cohorts.

The goal of this part of the analysis is to identify differences in the distributions of externalizing problems by gender, SES, and time period (i.e., cohort). I compare differences in the location of the 10th, 25th, 50th, 75th, and 90th percentiles of externalizing problems within-gender, within-SES, and within-time period. Doing so enables an understanding of where gender gaps emerge between females and males within each of the two time periods under study. Appendix Figure A.2 displays the number of children in each gender, SES, and cohort group at each of the percentiles of interest.

The second set of quantile regression analysis tests the mediating role of the family and health factors laid out at the start of this paper. I introduce covariates for demographic controls and internalizing problems, whichever SES measure is not used to stratify the sample, family structure, and early childhood health factors. In addition to estimating models separately for each SES group (first by income then by mother's education), separate models are also estimated for each of the five quantiles of interest.

At each quantile, covariates are added in six groups, corresponding to the hypotheses discussed above. Covariates are introduced in order from the most "fundamental causes" to the most "proximate causes" (Link and Phelan, 1995):[20] (1) no demographic controls beyond indicators for male, the 2001 birth cohort, and the interaction for male*2001 birth cohort, (2) demographic controls and internalizing behavior, (3) SES main effects, (4) interactions between socioeconomic status variables and gender, time period, and gender and time period, (5) family structure main effects, (6) interactions between family structure variables and gender, time period, and gender and time period, (7) health main effects, (8) interactions between the health variables and gender, time period, and gender and time period, (9) SES and family structure main effects together as "economic and cultural resources", (10) interactions between SES and family structure and gender, time period, and gender and time period, (11) SES, family structure, and health main effects, and (12) interactions between SES, family structure, and health and gender, time period, and gender and time period. Note that, when included in a given model, mother's years of schooling, per capita household income in 2011 dollars (in $1,000s), internalizing problems, mother's age at birth, and receptive vocabulary are centered at their overall sample mean.

Because the first part of each hypothesis relates to differences in exposure to the family and health factors by gender and time period, corresponding descriptive figures depicting the expected values and 95% confidence intervals of each of the potential family and health mechanisms are displayed at each of the quantiles of interest, by gender, SES, and time period. Expected values of the covariates at the particular quantiles are calculated by limiting the sample to the subset of observations that lie at the corresponding value of externalizing problems at that quantile (sample sizes shown in Figure A.2). The second part of each hypothesis investigates gender-by-time period response differences within SES groups. The purpose of these models is to understand whether response differentials

[20]The exception to this pattern of adding covariates is internalizing behavior problems, which are added along with demographic controls in order to isolate the component of externalizing problems that are not co-morbid with internalizing problems.

between boys and girls when they are exposed to each of the family and health factors affect the location of a given quantile of externalizing problems. Note that for brevity due to similarities in the general pattern of results across household income quartile and mother's education level, I focus on the results by income. However, all results by mother's education level are shown in the Appendix.

6 Results: Socioeconomic Disparities in the Spread of the Gender Gap in Externalizing Problems Across Cohorts

Figure 4 displays the distribution of mother-reported externalizing behavior problems for females and males in each of the two time periods by per capita household income quartile (adjusted to 2011 dollars). Panel 1 reveals that, among the poorest (income quartile one) children in the 1980s sample, there was only a one point gender gap between the females and males whose externalizing problems scores located them at the 75th and 90th percentiles of their respective externalizing problems distributions. There was a gender gap of 0.5 points between the means of the female and male distributions. By the 2000s, even though the difference between females' and males' mean levels of externalizing problems did not increase, the one point gender gap had spread throughout the entire distribution. This was due to a rightward shift of the entire distribution of externalizing problems among the poorest males. Even the boys with the lowest reported externalizing problems received ratings of higher externalizing problems. Meanwhile, a one point increase in externalizing problems occurred only among the lowest income quartile females with the highest reported levels of externalizing problems. A similar pattern played out among females and males in the second income quartiles, shown in panel 2 of Figure 4.

[FIGURE 4 ABOUT HERE]

Panels 3 and 4 document that, for children from higher-income families (those in quartiles 3 and 4 of household income), the upward shift in males' externalizing problems distribution occurred only for those whose externalizing problems scores placed them at the 50th, 75th, and 90th percentiles of the externalizing problems distribution. This shift produced a gender gap in the location of quantiles in the top half of the distribution in the 2000s that existed only in the location of the top 25 percent of externalizing scores in the 1980s distribution. The result was that, by the 2000s, a gender gap existed only between the higher income females and males with behavior problems scores that placed them in the top 50% (i.e., poorly-behaved) of their respective externalizing problems distributions.

Figure 5 facilitates comparisons in the levels of externalizing problems across genders and time periods among children within a given income quartile (i.e., it displays females' and males' within- gender, -time period, and -income quartile expected values of externalizing problems). Figure 5 shows that, compared to their peers from higher-income families, children from lower-income families tend to have higher levels of externalizing problems throughout the externalizing problems distribution. This is especially true among the children from lower-income families who received externalizing problems ratings that placed them in the 75th and 90th percentiles of behavior problems. In the 2000s, even males from lower-income families whose externalizing problems scores placed them in the bottom 25 percent of the externalizing problems distribution tended to have higher levels of externalizing problems than males in the 1980s and females in both periods. The latter fact led to a gender gap in the later period even between the "best-behaved" first and second income quartile children. There was no gender gap in either period between the "best-behaved" higher income (i.e., third and fourth income quartile) children.

[FIGURE 5 ABOUT HERE]

Whereas Figure 5 depicts clearly levels of externalizing problems by gender and time period across socioeconomic groups, Figure 6 highlights gender gaps in these externalizing problems scores, also by income quartile. Panel 1 of Figure 6 shows that, in the 1980s, a one or two point gender gap existed in the location of the 75th and 90th percentiles of externalizing problems between females and males from families across all but the highest household income brackets (i.e., the males among the highest behavior problem ratings had higher externalizing problems scores than the females among the highest behavior ratings). Interestingly, a one point gender gap in the location of the 25th and

50th percentiles of externalizing problems existed between only the females and males from families in the highest two income quartiles. However, this gap appears to be due to mothers in the highest two income quartiles reporting lower behavior problem scores for their daughters than did mothers in the lowest two income quartiles. Across income quartiles, there was no gender gap in the location of the 10th percentile of externalizing problems.

Panel 2 of Figure 6 displays the change in the magnitude of the gender gap by income quartile between the 1980s and the 2000s. Panel 2 shows that, by the 2000s, the gender gap had spread across a wider cross-section of the behavioral distribution among children from the two lowest income quartiles. Whereas there was no gender gap in the location of the 10th, 25th, or 50th percentiles of children from families in the lowest two income quartiles in the 1980s, the gap became ubiquitously dispersed by the 2000s. And, the gap occurred at higher levels of externalizing problems among the two lowest income quartiles of children. For the children from the two highest income quartiles, the gap did not spread any further than it had in the 1980s. In fact, the gap that did exist among children from the third income quartile at the 25th percentile of externalizing problems disappeared by the 2000s.

[FIGURE 6 ABOUT HERE]

Gender Differences in Exposures and "Effects": Families, Health, and the Growth of the Gender Gap in Externalizing Problems

The growth of the gender gap in the location of a given percentile of externalizing problems among children from families in a given income quartile may be explained by differences between boys and girls in levels or types of family and health exposure. Or, the growth of the gap may be explained by differences in the "effects" of family structures and health on boys and girls' externalizing problems. Children in the bottom two income quartiles each experienced a growth of the gender gap in the location of the 10th, 25th, and 50th percentiles of externalizing problems between the 1980s and 2000s cohorts. Because the following results at corresponding percentiles follow a relatively similar pattern across income quartiles 1 and 2, results from income quartile 2 are shown in the Appendix. Descriptive means and 95% confidence intervals for females and males in the early and late time periods within each income quartile and at each observed percentile of externalizing problems are shown in Appendix Figures A.3-A.5. The results presented here also focus on the lower half of the externalizing problems distributions (i.e., on the location of the 10th, 25th, and 50th percentiles of externalizing problems), where the gender gap emerged between the 1980s and 2001 cohorts.

Results shown in the top panel of Figure 7 indicate that the entire one point (roughly 0.45 standard deviation) growth of the gender gap in the location of the 10th percentile of externalizing problems among the lowest income quartile children is accounted for by the rise in mothers' reports of boys' internalizing problems across these two cohorts (see also Appendix Table A.1). The coefficient in model (1) on the interaction term for males in the 2001 birth cohort shows the unadjusted one point growth in the gender gap. By adjusting for males' slightly higher level of internalizing problems, therefore comparing females and males with the same level of internalizing problems, model (2) accounts for the growth of the gender gap in externalizing problems. Models (3)-(12) reveal that neither compositional differences between males and females in levels of exposure to family structure and health, nor gender differences in response play an important role in explaining the growth of the gender gap in the location of the 10th percentile of externalizing problems among the lowest income children. Note that in this and all subsequent models, the three-way interaction terms between each early childhood health factor, gender, and time period are dropped because of multicollinearity. This indicates no differential effect of the observed early childhood health factors for males and females in the 2001 birth cohort.

The second panel of Figure 7 shows that, among the lowest income quartile boys and girls, 47% of the one point growth of the gender gap in the location of the 25th percentile of externalizing problems shown in model (1) is explained by gender differences in the internalizing problems added in model (2) (see also Appendix Table A.2). Although boys had lower levels of internalizing problems than girls in the 1980s cohorts, the boys in the 2001 cohort had slightly higher levels of internalizing problems than girls. Models (3) and

(4) show that, among the lowest income quartile children, neither compositional differences nor differences in the effects of mothers' years of schooling account for any more of the growth in the gender gap. Model (5) indicates that an additional 13 percentage points of the growth in the gap is accounted for by boys' slightly higher exposure to single mother and social father households at age 4, both of which are associated with higher levels of externalizing problems compared to being raised by two biological parents. Models (6)-(7) indicate that neither gender differences in the effects of non-traditional family structures nor gender differences in exposure to early health risks account for any more of the growth in the gap than that explained by gender differences in internalizing problems. Model (8) reveals that, due to males' greater exposure to pre-term birth and asthma diagnosis, the more negative (though not statistically significant) association between pre-term status and asthma diagnosis and externalizing problems for the 2001 compared to the 1980s sample accounts for an additional 9 percentage points of the growth in the gap than that accounted for by gender differences in internalizing problems (model 2). Models (9)-(12) document that jointly modeling family and health factors does not help explain any more of the growth in the externalizing problems gap.

[FIGURE 7 ABOUT HERE]

Models (1)-(2) of the third panel of Figure 7 show that, among the lowest income quartile females and males, gender differences in internalizing problems do not account for any of the one point growth of the gender gap in the location of the 50th percentile of externalizing problems (see also Appendix Table A.3). Model (3) reveals that 26% of the growth is accounted for by the fact that children of mothers with above the sample average years of schooling are rated on average as having lower levels of externalizing problems. Among the lowest income quartile children whose externalizing score locates them at the 50th percentile of externalizing problems, females are born to slightly more educated mothers than their male counterparts. Model (4) shows that boys tend to benefit slightly less than girls from having more educated mothers. In the later period, boys are rated as having slightly higher levels of externalizing problems by mothers with above-average years of schooling, accounting for an additional 2.5 percentage-points of the growth of the gap compared to that explained by the factors in model (3). Model (5) shows that, compared to model (2), males' higher level of exposure to single mother and social father compared to two biological parent households at age 4 accounts for 50% of the growth of the gender gap in the location of the 50th percentile of externalizing problems among the lowest income quartile children. Model (6) reveals that, in the 2001 sample, males with single mothers or social fathers at age 4 (compared to 2 biological parents at home) are rated as having higher levels of externalizing problems than their female counterparts. This differential association with rated externalizing problems for boys compared to girls raised in single mother and social father households accounts for the entirely (100%) of the growth of the gender gap in the location of the 50th percentile of externalizing problems among the lowest income children. Model (7) reveals that, compared to model (2), boys' higher levels of pre-term birth and asthma diagnosis account for 66% of the growth in the gap in externalizing problems. Model (8) shows that, although not statistically different, pre-term birth and asthma diagnosis are associated with higher ratings of externalizing problems among children in the later compared to the earlier period. Due to boys' higher levels of pre-term birth and asthma diagnosis, the larger association between pre-term and asthma and externalizing problems in the later period accounts for an additional 2.4 percentage points of the growth in the gap. Models (9)-(12) indicate that these family and health factors are highly correlated. Jointly modeling them does not account for anymore of the growth in the gap than that explained by modeling these factors independently.

7 Discussion

The past fifty years have witnessed a dramatic rise in income inequality among American families (Gottschalk and Danziger, 2005). Comparing the inflation- and household size-adjusted incomes of families at the 90th percentile to those at the 10th percentile, research shows that family income inequality increased by more than 50% between 1975 and 2002 (Gottschalk and Danziger, 2005). Strikingly, over the same period, the income achievement gap between children from families at the 90th percentile compared to children from families at the 10th percentile of household incomes (i.e., "the income achievement gap") also grew by 30 to 40 percent (Reardon, 2011). Research shows that the income achievement gap has grown rather steadily for children born in 1975 compared to those born in 2001 (Reardon, 2011). Another remarkable component of the income achievement gap is that, by roughly 2010, it was almost twice as large as the black-white achievement gap – even though the opposite was true fifty years prior (Reardon, 2011).

Early childhood is an important time to consider the gender gap in externalizing problems within the context of the income achievement gap because both the gender gap in achievement and the income achievement gap are apparent by kindergarten entry and persist through schooling (DiPrete and Jennings, 2012; Duncan and Magnuson, 2011). Therefore, the gender and income achievement gaps with which children enter school lay the foundations for much of the persisting inequality evident throughout childhood and well into adolescence. However, despite the presence of both the gender and income achievement gaps throughout the early life-course and their dramatic implications for socioeconomic and gender inequality at the population level, little research has examined the evolution of these two gaps in tandem. The present study sought to begin to remedy this shortcoming in prior research.

This study draws on a comparison of externalizing behavior problems among children ages 4 or 5 in two national samples – one from the 1980s, the other from the 2000s. Results show that, as the prevalence of ADHD diagnosis in recent decades has increased faster among lower compared to higher socioeconomic status children, so too has the gender gap in the closely-linked externalizing behavior problems that produce ADHD become more entrenched within low socioeconomic status children. As the gender gap in externalizing problems has spread to a wider cross-section of children, it has become markedly concentrated among the two lowest income quartiles of children. For these children, a one point (or roughly 0.45 standard deviations) growth in the gender gap appears even between the "best-behaved" lowest income quartile boys and girls – those with the lowest mother-rated behavior problems. This one point increase in the gender gap in mothers' reports of externalizing problems results from a shift from a rating of "rarely" to "often" or from "often" to "always" on one of the six behaviors that comprise the externalizing problems scale. In clinical terms, a one point increase from not exhibiting to exhibiting a particular externalizing behavior is equivalent to one sixth of the criteria necessary for an ADHD diagnosis according to the Diagnostic and Statistical Manual (DSM)-IV in effect since 1994. Although each item in the externalizing problems scale consists of a three-point to five-point frequency range, the corresponding items in the DSM-IV are binary; they rely on assessments of whether or not a child exhibits a particular behavior or not.

Among children in the bottom half of the distribution of family incomes in the 1980s (i.e., those in the two lowest per capita household income quartiles), the gender gap was concentrated among the top half of these children's behavioral distribution – i.e., it was largest among those with the worst-rated externalizing problems behavior. By the 2000s, the gender gap in externalizing problems had spread throughout the entire distribution of children, showing up between the girls and boys with the lowest behavior problem ratings. This spread of the gender gap in externalizing problems across the entire range of low-income children resulted from the larger increase in mothers' reports of boys' compared to girls' behavior problems among virtually all boys, including those with the lowest rated behavior problems. Although the gender gap appeared up through the 25th percentile of children among those from the top two income quartiles back in the 1980s, this gap appeared at much lower levels of reported behavior problems. The gap in the location of the 25th percentile among children in the second-highest income quartile also closed by the 2000s. In light of these results, a primary contribution of the present study is to encourage attention among researchers and policy makers to the social class-specific patterns of the evolution of gender differences in behavior problems.

The second primary aim of this study was to begin to understand whether the apparent growth of the gender gap in behavior problems among even the "best-behaved" low-income children in the 2001 cohort was due to real changes in behavior across the past two decades. Alternatively, the growth in the reported gap may have been due to shifts in perceptions of externalizing problem behaviors in gender- and social class-specific ways. This question is especially important in light of research showing dramatic jumps in externalizing problems-linked behavior problem prevalence – like the diagnosis of ADHD – with changes in diagnostic criteria (Wolraich et al., 1996). Similarly, with the passage of the Affordable Care Act and other changes that may increase medical coverage for low income Americans, we may see a continued rise in prevalence of ADHD diagnosis and shifts in reporting of children's behavior problems in the coming decades. Given these changes, even if changes in diagnostic criteria with the release of subsequent DSM ratings or newly-found access to medical coverage lead to an artificial jump in diagnosed ADHD prevalence, internalized perceptions of behavior problems and the stigma of medical labels have real consequences. Parents may view and treat their sons as worse behaved today than parents did in past decades, and millions of children may grow up with the label and associated belief in the validity of their "problem child" status.

One of the most interesting results of the second part of the present study is the importance of gender differences in mother reports of internalizing problems. The gender difference in internalizing problems accounts for much of the growth of the gender gap in externalizing problems among low-income children rated in the bottom half of the behavior problem distribution (i.e., the "better-behaved" children). For example, gender differences in internalizing problems account for the entirety of the growth in the gender gap in externalizing problems among the "best-behaved" of the lowest income children. Internalizing behavior problems also are measured based on mothers' subjective reports of boys' and girls' externalizing problems. High-stakes testing, the use of stringent disciplinary tactics in schools, the incidence of behavioral disorder diagnosis, and the rise in awareness of depression and other mental health factors in shaping academic achievement each have become more ubiquitous over the past few decades (Duncan and Magnuson, 2011; Mendez, 2003; Olfson et al., 2003). Amid these changes, mothers may have not only become more inclined to rate their sons as having higher levels of externalizing problems, but also internalizing problems. The finding of the importance of gender differences in the rise in reports of boys' internalizing problems is as consistent with the story that behavior ratings may have changed across time as it is with the possibility that there has been a true increase in boys' internalizing behavior problems.

At the same time, results also suggest that at least part of the spread in the gender gap in externalizing problems to a wider cross-section of low income children is associated with observed changes in families and, to a lesser extent, early childhood health risks. Interestingly, gender differences in reports of internalizing problems account for less of the growth in the gender gap in externalizing problems when examining children with relatively higher levels of externalizing problems compared to their same-gender peers. Gender differences in mother's internalizing problems ratings of boys and girls account for half as much (roughly 50%) of the growth of the gap in the location of the 25th percentile of externalizing problems, and none of the growth of the gap at the 50th percentile of externalizing problems. Here instead, gender differences in exposure to or the effects of factors like single mother or social father households or pre-term birth status account for more of the growth. This suggests that subjective perceptions of behavior problems may drive the growth in the gender gap in externalizing problems among the "better-behaved" children (i.e., those rated as having relatively lower levels of externalizing problems). By contrast, the growth in the gender gap in externalizing among the "worse-behaved" children may be less influenced by gender differences in subjective behavior assessments.

Unfortunately, due to power issues as a result of relatively small sample sizes withing behavior percentiles and income categories, this study is not able to accurately identify which specific family and health factor(s) accounts for the growth in the gender gap in externalizing problems, where it occurs. The result is the lack of ability to begin to think more closely about targeting specific policy or other interventions to addressing these factors as a route to closing the gender gap in behavior and educational achievement. Another limitation of the present study is the inability to account for gender differences in cognitive development in light of the high correlation between cognitive and behavioral skills. Future work may include examination of changes across cohorts and genders in the development of early receptive vocabulary, which appears to be closely linked to externalizing behavior. Finally, it is important to note that a shift across cohorts in the reporting of behavior problems may produce a fundamental change in the behavioral scales themselves that is undetectable within the survey data used here. Future studies designed specifically to investigate this possibility are essential.

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Table 1: Sample Restrictions Applied to the NLSY-C and ECLS-B Data

	NLSY-C	ECLS-B
Full Sample	11,500	10,700
Mothers 18-29 years at birth	11,500	6,100
Children born 1983-1986 (If NLSY-C)	3,000	N/A
Randomly-selected child if siblings in sample (Randomly-selected twin, if applicable)	2,600	5,700
Non-missing on externalizing	2,000	4,600

Note: In compliance with ECLS-B restricted-used reporting guidelines (and for comparability in reporting across datasets), sample sizes are rounded to the closest 50.

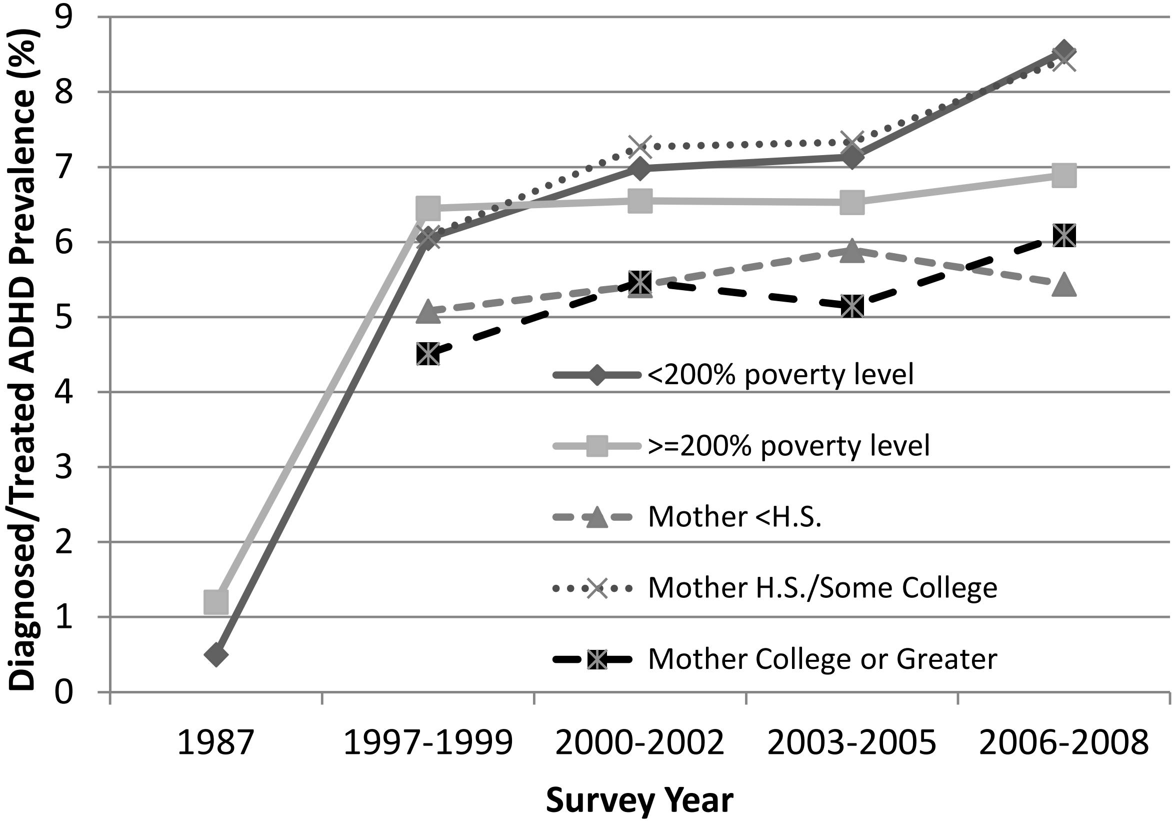
Table 2: Items in the Externalizing Problems Scale (and Self-Regulation and Social Problems Sub-Scales)

Scale/Subscale Name:	CBCL (BPI) EXTERNALIZING ITEMS AVAILABLE IN **NLSY-C**[1]	COMPARABLE PKBS-2 (PBS) EXTERNALIZING ITEMS AVAILABLE IN THE **ECLS-B**[2]
SELF-REGULATION PROBLEMS:		
Attention Problems/Overactive	Is impulsive/acts w/o thinking	Acts impulsively
	Is restless, overly active, can't sit still	Is overly active
SOCIAL PROBLEMS:		
Antisocial/Aggressive	Has trouble getting along w/ other kids	Is (not) invited to play by other children (reverse-coded)
	Breaks things on purpose	Destroys others' things
	Is not liked by other children	Is (not) liked by other children (reverse-coded)
Self-Centered/Explosive	Has strong temper and loses it easily	Has temper tantrums
	Cronbach's Alpha: 0.70	Cronbach's Alpha: 0.75

[1]Within the NLSY-C's more general Behavior Problems Index (BPI; developed by Peterson and Zill 1986) were 10 externalizing items. Of these, 6 overlapped almost identically with those available in the ECLS-B. The item listed in italics is included in the BPI-based externalizing scale, but not in the CBCL-based externalizing scale (see Guttmannova et al. 2007 for a discussion of why CBCL measures are more valid than the BPI items). However, to maximize coverage, it is included in the present externalizing scale.

[2]The ECLS-B includes a total of 8 externalizing items from the broader Problem Behaviors Scale of the Pre-Kindergarten Behavioral Skills, 2nd Ed. scale. Two PKBS-2 items (Child is physically aggressive and Child is angry) available in the ECLS-B were not used in the present scale due to non-corresponding items in the NLSY-C. However, the subset of items used in the present externalizing scale include at least one item from each of the three primary externalizing sub-scales (attention problems/overactive, etc.) listed above. In order to correspond to the NLSY-C scale of: 1=not true/rarely, 2=sometimes, 3=often, the ECLS-B items are rescaled from 1 (never)-5 (very often) to 1-3 using two approaches: (1) merging of extreme categories ("very often" with "often" and "never" with "rarely"); (2) a linear rescaling using the formula: x *.5 + .5.

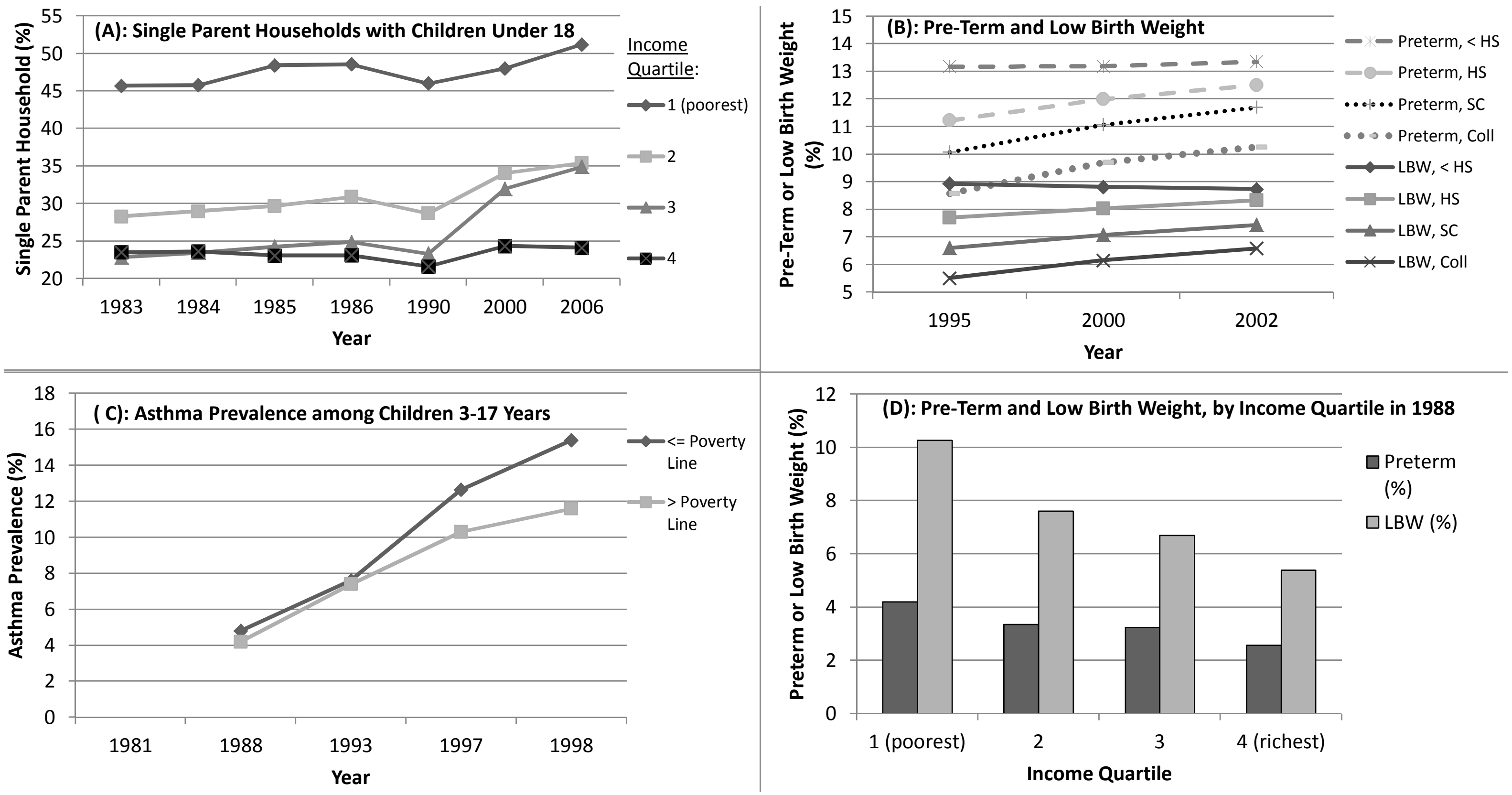
Figure 1: Rates of Diagnosed/Treated ADHD Prevalence Among American Children 3-18 Years by Socioeconomic Status, 1987-2008



Sources: [1]1987 data come from Olfson et al. (2003), which draws on the National Medical Expenditure Survey item about rates of ADHD treatment among children aged 3-18 years in the U.S.

[2]1997-2008 data come from Boyle et al. (2008) and draw on the National Health Interview Survey item about prevalence of ADHD diagnosis among children aged 3-17 years in the U.S.

Figure 2: Single Parent Households, Low Birth Weight & Pre-Term, and Asthma among Children by Socioeconomic Status and Year



Notes: Low birth weight is defined as fewer than 2,500g (5.5 pounds). Rates of pre-term are lower than one might expect. This is because the IHIS defines pre-term as fewer than 36 weeks gestation. Low birth weight is defined as fewer than 2,500g (5.5 pounds). Pre-term is defined as fewer than 37 weeks gestation.

Sources: (A) and (D): Author's tabulations from Minnesota Population Center and State Health Access Data Assistance Center, Integrated Health Interview Series: Version 5.0. Minneapolis: University of Minnesota, 2012. http://www.ihis.us. Accessed Online June 9, 2013. (B): Author's tabulations from the United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Division of Vital Statistics, Natality public-use data 1995-2002, on CDC WONDER Online Database, November 2005. Accessed at http://wonder.cdc.gov/natality-v2002.html on June 9, 2013. (C): Weitzman et al. (1990), Halfon & Newacheck (1993), Akinbami, LaFleur, and Schoendorf (2002), Smith et al. (2005), and Blackwell & Tonthat (2002).

Figure 3: Data Structure and Behavioral Measures Coverage

		Age						
		0	1	2	3	4	5	6
Year	1983	NLSY-C						
	1984	NLSY-C	NLSY-C					
	1985	NLSY-C	NLSY-C	NLSY-C				
	1986	NLSY-C	NLSY-C	NLSY-C	NLSY-C			
	1987		NLSY-C	NLSY-C	NLSY-C	NLSY-C		
	1988			NLSY-C	NLSY-C	NLSY-C	NLSY-C	
	1989				NLSY-C	NLSY-C	NLSY-C	NLSY-C
	1990					NLSY-C	NLSY-C	NLSY-C
	1991						NLSY-C	NLSY-C
	1992							NLSY-C
	1993							
	1994							
	1995							
	1996							
	1997							
	1998							
	1999							
	2000							
	2001	ECLS-B						
	2002		ECLS-B					
	2003			ECLS-B				
	2004				ECLS-B			
	2005					ECLS-B		
	2006						ECLS-B	
	2007							ECLS-B
	2008							

NOTE: Grey text indicates that behavioral skills were not measured in a given year or at a given age (the complete set of behavioral skills were not collected for children under age 4).

Figure 4: Externalizing Problems Distribution, by Per Capita Household Income Quartile, Gender, and Cohort

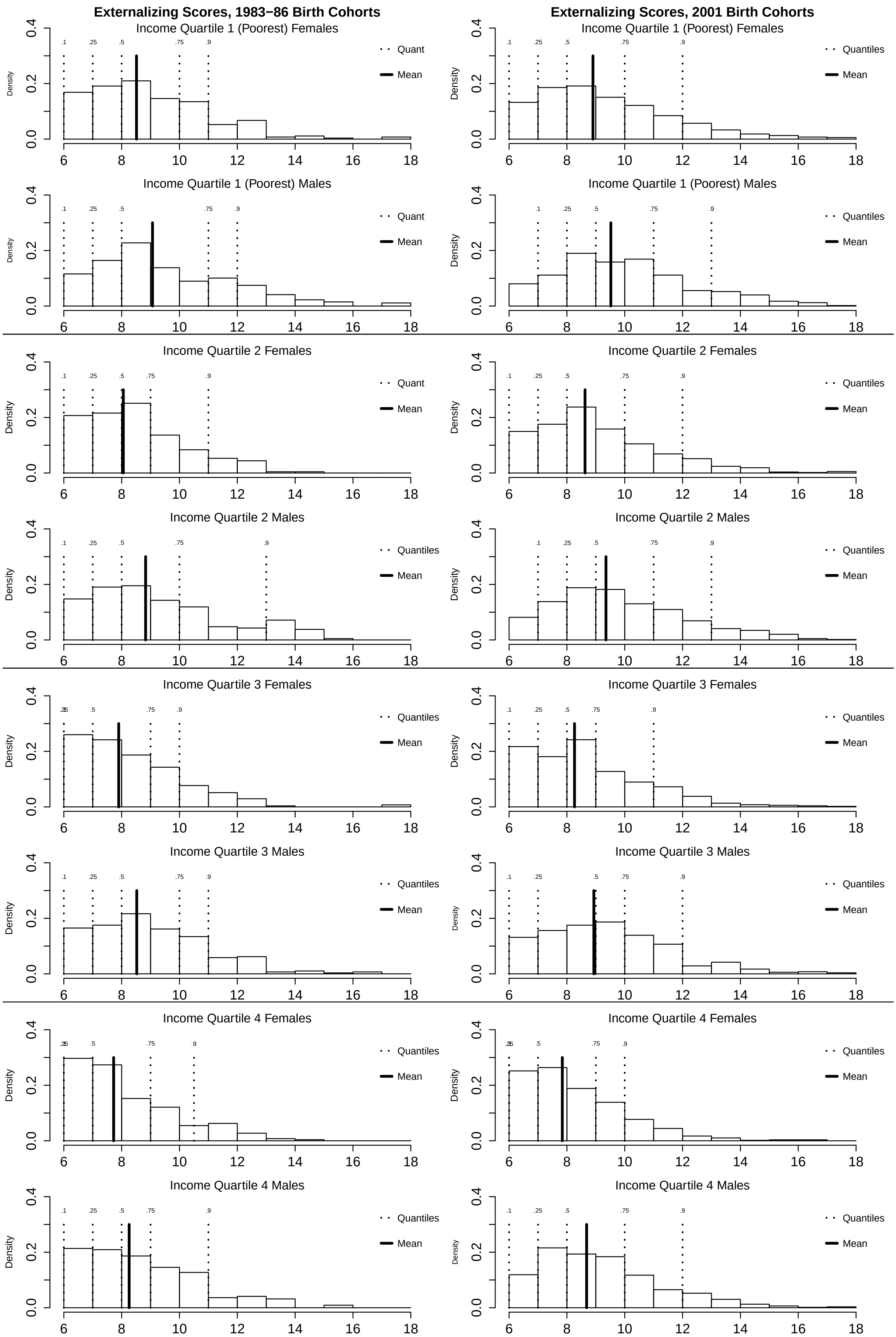


Figure 5: Expected Values of Externalizing Problems at Ages 4 and 5 at Various Points in the Behavioral Distribution, by Per Capita Household Income Quartile, Cohort, and Gender

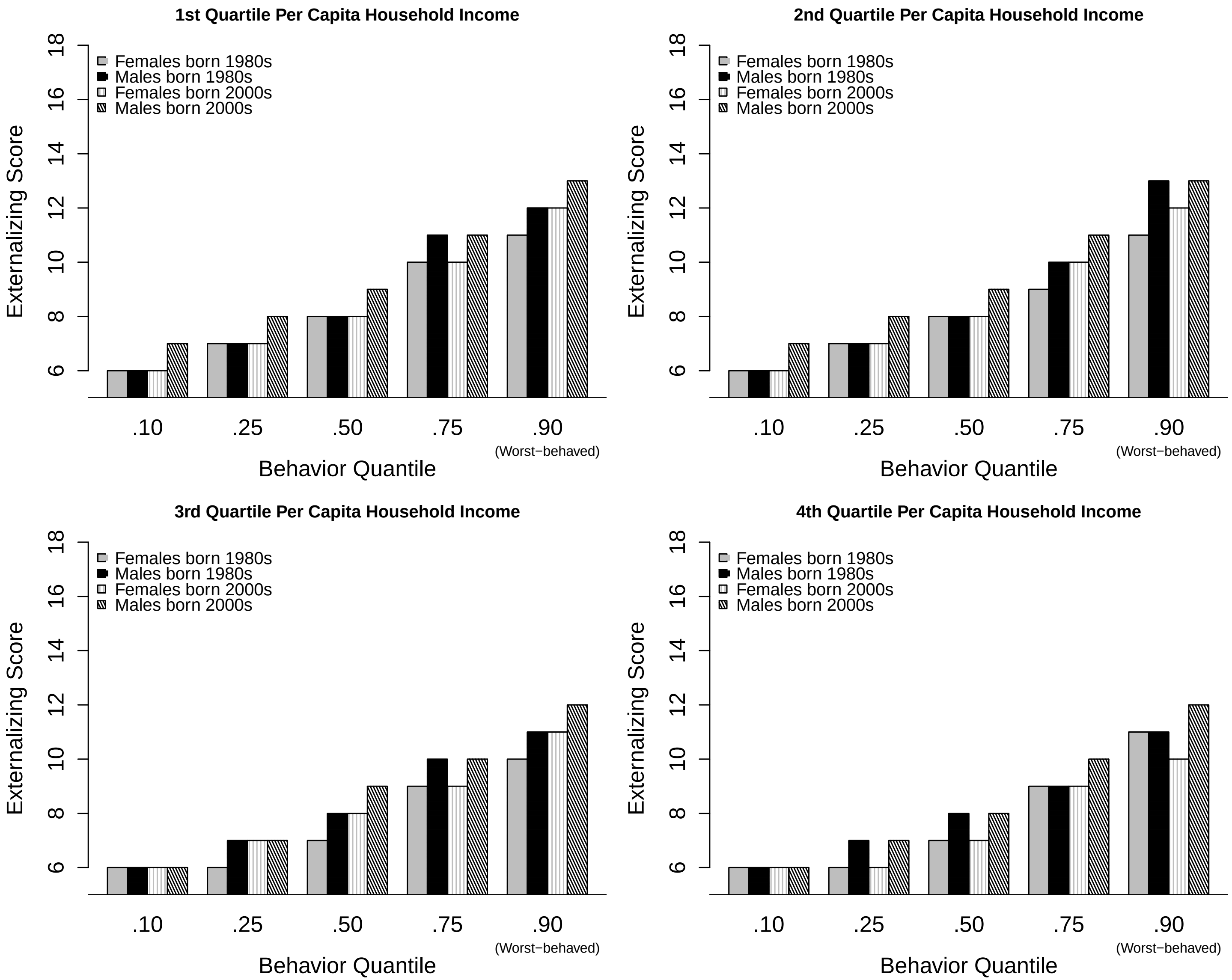


Figure 6: Gender Gap in Externalizing Problems at the 10th, 25th, 50th, 75th, and 90th Percentiles Within Girls' and Boys' Respective Behavioral Distributions and Change in Gender Gaps Between the 1980s and 2001 Cohorts, by Per Capita Household Income Quartile

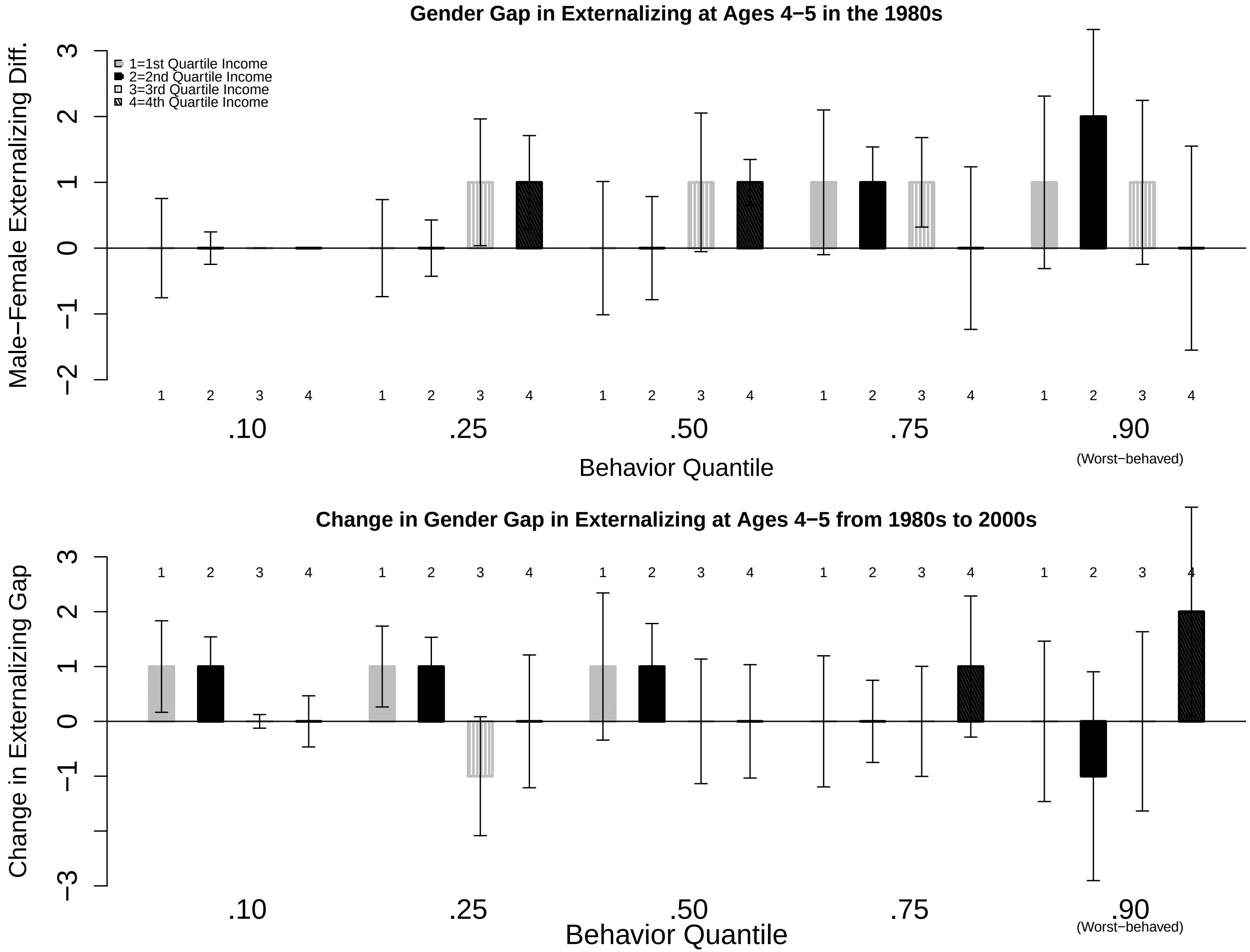
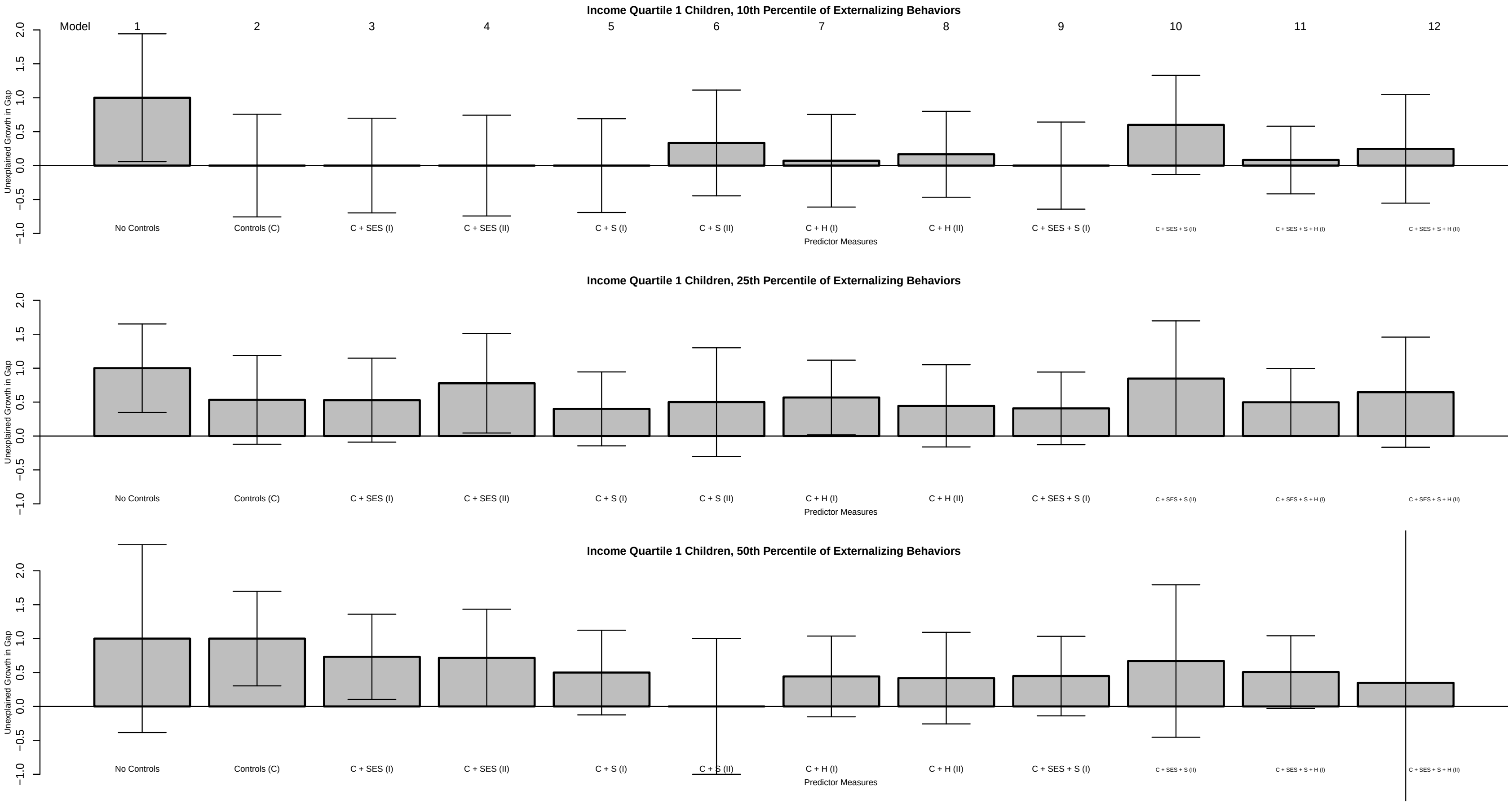


Figure 7: Potential Family and Health Mediators of the Growth of the Gender Gap in the Location of the 10th, 25th, and 50th Percentiles of Externalizing Behavior Problems at Ages 4-5 among Children from Families in Income Quartile 1



Notes: See the Appendix for the full table of results. Model labels refer to: Controls (C): Internalizing problems (centered), mother's age at birth (centered), birth order, dummies for black and Hispanic (reference is white or Asian) and year of birth (1984-1986); SES (I): mother's years of schooling at birth (centered); SES (II): mother's years of schooling interacted with each of the following: male, time period (2001 cohort indicator variable), and male*time period; Family Structure (S) (I): father absent at birth dummy and dummies for single mother at age 4 or social father at age 4 (two biological parents at age 4 is the reference); S (II): interactions between each of the S (I) variables and male, time period, and male*time period; Early Childhood Health (H) (I): a dummy for low birth weight, a dummy for pre-term, and a dummy for asthma diagnosis by age 4 or 5; H (II): interactions between each H (I) variable and male, time period, and male*time period.

Appendix A

General Supplemental Results

Table A.1: Potential Family and Health Mediators of the Gender Gap in the Location of the 10th Percentile of Externalizing Problems among Per Capita Household Income Quartile 1 Children Ages 4-5

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	NC:	C:	C + SES (I):	C + SES (II):	C +S (I):	C + S (II):	C + H (I):	C + H (II):	C + SES + S (I):	C + SES + S (II):	C + SES + S + H (I):	C + SES + S + H (II):
2001 Birth Cohort	0.000	-0.000	-0.000	-0.000	-0.000	0.000	-0.029	0.000	-0.000	-0.210	-0.037	-0.173
	(0.100)	(0.302)	(0.295)	(0.298)	(0.271)	(0.316)	(0.284)	(0.248)	(0.247)	(0.304)	(0.205)	(0.342)
Male	0.000	0.500*	0.500*	0.500*	0.500*	0.000	0.450*	0.167	0.500*	-0.048	0.439*	-0.152
	(0.401)	(0.246)	(0.242)	(0.250)	(0.227)	(0.257)	(0.222)	(0.234)	(0.210)	(0.254)	(0.188)	(0.319)
2001 Birth Cohort * Male	1.000*	0.000	0.000	0.000	0.000	0.333	0.071	0.167	0.000	0.600	0.082	0.246
	(0.481)	(0.386)	(0.356)	(0.379)	(0.352)	(0.398)	(0.348)	(0.323)	(0.327)	(0.372)	(0.254)	(0.408)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth of Child[1]			-0.000	0.000					-0.000	-0.002	-0.024	0.005
			(0.023)	(0.047)					(0.027)	(0.040)	(0.029)	(0.055)
Mother's School * Male				-0.000						-0.034		-0.042
				(0.064)						(0.073)		(0.079)
Mother's School * 2001 Cohort				-0.000						-0.034		-0.018
				(0.073)						(0.073)		(0.084)
Mother's School * Male * 2001 Cohort				0.000						-0.006		-0.045
				(0.111)						(0.120)		(0.125)
Family Structure:												
Father Absent at Birth					0.000	-0.333			0.000	-0.422	-0.060	-0.413
					(0.110)	(0.295)			(0.113)	(0.287)	(0.124)	(0.300)
Single Mother at Age 4					-0.000	0.333			-0.000	0.153	0.138	0.271
					(0.132)	(0.277)			(0.137)	(0.282)	(0.139)	(0.293)
Social Father at Age 4					-0.000	0.667			-0.000	0.495	0.287	0.633
					(0.232)	(0.544)			(0.222)	(0.529)	(0.194)	(0.550)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						0.667+				0.566		0.521
						(0.385)				(0.382)		(0.393)
Single Mother at Age 4 * Male						-0.000				0.136		0.221
						(0.401)				(0.404)		(0.395)
Social Father at Age 4 * Male						-0.333				-0.369		-0.344
						(0.834)				(0.873)		(0.915)
Father Absent at Birth * 2001 Birth Cohort						0.333				0.413		0.411
						(0.360)				(0.328)		(0.348)
Single Mother at Age 4 * 2001 Birth Cohort						-0.333				-0.216		-0.308
						(0.342)				(0.329)		(0.350)
Social Father at Age 4 * 2001 Birth Cohort						-0.333				-0.043		-0.297
						(0.654)				(0.615)		(0.601)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.667				-0.621		-0.786
						(0.558)				(0.521)		(0.539)
Single Mother at Age 4 * Male * 2001 Birth Cohort						0.333				-0.033		-0.042
						(0.543)				(0.548)		(0.547)
Social Father at Age 4 * Male * 2001 Birth Cohort						0.333				0.039		0.433
						(1.050)				(1.022)		(1.044)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.150	0.167			0.245	0.076
							(0.193)	(0.429)			(0.163)	(0.432)
Pre-Term Birth (<37 weeks gestation)							0.043	-0.167			0.014	-0.090
							(0.110)	(0.291)			(0.123)	(0.343)
Asthma Diagnosis by Age 4 or 5							0.100	0.000			0.137	-0.576
							(0.147)	(0.479)			(0.138)	(0.511)
Low Birth Weight * Male								0.333				0.260
								(0.385)				(0.332)
Pre-Term Birth * Male								0.333				0.279
								(0.324)				(0.296)
Asthma Diagnosis * Male								0.000				0.221
								(0.341)				(0.338)
Low Birth Weight * 2001 Cohort								-0.167				-0.011
								(0.489)				(0.471)
Pre-Term Birth * 2001 Cohort								0.167				0.095
								(0.326)				(0.373)
Asthma Diagnosis * 2001 Cohort								-0.000				0.639
								(0.472)				(0.496)
Controls:												
Black		0.000	0.000	0.000	-0.000	0.000	0.014	0.000	-0.000	0.118	0.014	0.055
		(0.064)	(0.069)	(0.097)	(0.140)	(0.151)	(0.087)	(0.084)	(0.146)	(0.140)	(0.163)	(0.156)
Hispanic		0.000	0.000	0.000	0.000	0.333+	0.171	0.333	0.000	0.271	0.168	0.337+
		(0.198)	(0.173)	(0.174)	(0.190)	(0.194)	(0.181)	(0.218)	(0.181)	(0.178)	(0.167)	(0.180)
Internalizing[1]		0.500**	0.500**	0.500**	0.500***	0.333*	0.350*	0.333*	0.500***	0.279*	0.319**	0.301**
		(0.168)	(0.157)	(0.153)	(0.134)	(0.141)	(0.139)	(0.136)	(0.119)	(0.127)	(0.097)	(0.102)
Mother's Age at Birth[1]		-0.000	-0.000	-0.000	-0.000	0.000	0.007	0.000	-0.000	0.009	0.022	0.007
		(0.010)	(0.014)	(0.015)	(0.017)	(0.014)	(0.015)	(0.016)	(0.019)	(0.018)	(0.021)	(0.019)
Birth Order		0.000	0.000	0.000	0.000	-0.000	-0.043	-0.000	0.000	-0.045	-0.071	-0.043
		(0.035)	(0.042)	(0.053)	(0.042)	(0.039)	(0.047)	(0.049)	(0.049)	(0.046)	(0.047)	(0.047)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.000	0.000	0.000	0.000	-0.000	0.064	0.167	0.000	-0.018	0.014	-0.013
		(0.361)	(0.328)	(0.344)	(0.298)	(0.213)	(0.324)	(0.286)	(0.289)	(0.228)	(0.256)	(0.244)
Child Born 1985		-0.500	-0.500+	-0.500+	-0.500+	-0.333	-0.393	-0.167	-0.500+	-0.324	-0.371	-0.363
		(0.311)	(0.301)	(0.293)	(0.282)	(0.257)	(0.274)	(0.264)	(0.257)	(0.246)	(0.230)	(0.280)
Child Born 1986		-0.500+	-0.500+	-0.500+	-0.500+	-0.333	-0.636*	-0.500+	-0.500+	-0.496+	-0.592*	-0.552+
		(0.275)	(0.271)	(0.282)	(0.261)	(0.295)	(0.280)	(0.297)	(0.256)	(0.278)	(0.245)	(0.301)
Constant	6.000***	6.331***	6.331***	6.331***	6.331***	6.220***	6.337***	6.220***	6.331***	6.459***	6.297***	6.439***
	(0.063)	(0.272)	(0.263)	(0.286)	(0.263)	(0.320)	(0.264)	(0.259)	(0.252)	(0.315)	(0.227)	(0.332)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table A.2: Potential Family and Health Mediators of the Gender Gap in the Location of the 25th Percentile of Externalizing Problems among Per Capita Household Income Quartile 1 Children Ages 4-5

VARIABLES	(1) NC:	(2) C:	(3) C + SES (I):	(4) C + SES (II):	(5) C +S (I):	(6) C + S (II):	(7) C + H (I):	(8) C + H (II):	(9) C + SES + S (I):	(10) C + SES + S (II):	(11) C + SES + S + H (I):	(12) C + SES + S + H (II):
2001 Birth Cohort	0.000	-0.170	-0.107	-0.186	0.000	-0.000	-0.356	-0.289	-0.031	-0.345	-0.259	-0.560
	(0.000)	(0.239)	(0.237)	(0.234)	(0.255)	(0.344)	(0.255)	(0.267)	(0.271)	(0.324)	(0.247)	(0.357)
Male	0.000	0.252	0.239	0.041	0.200	0.000	0.186	0.156	0.277	-0.157	0.272	-0.162
	(0.332)	(0.269)	(0.238)	(0.274)	(0.210)	(0.293)	(0.225)	(0.226)	(0.208)	(0.339)	(0.191)	(0.351)
2001 Birth Cohort * Male	1.000**	0.533	0.529+	0.777*	0.400	0.500	0.568*	0.444	0.408	0.847+	0.497+	0.646
	(0.332)	(0.334)	(0.316)	(0.374)	(0.278)	(0.408)	(0.281)	(0.309)	(0.273)	(0.434)	(0.254)	(0.414)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth of Child[1]			-0.043	0.005					-0.046	-0.027	-0.028	-0.043
			(0.036)	(0.066)					(0.036)	(0.072)	(0.038)	(0.078)
Mother's School * Male				-0.089						-0.016		0.032
				(0.094)						(0.100)		(0.101)
Mother's School * 2001 Cohort				-0.098						-0.022		-0.008
				(0.083)						(0.091)		(0.098)
Mother's School * Male * 2001 Cohort				0.175						0.004		-0.027
				(0.134)						(0.137)		(0.139)
Family Structure:												
Father Absent at Birth					-0.000	0.000			0.054	-0.301	0.131	-0.448
					(0.152)	(0.323)			(0.142)	(0.336)	(0.152)	(0.344)
Single Mother at Age 4					0.400*	-0.000			0.362*	0.163	0.248	0.015
					(0.187)	(0.332)			(0.182)	(0.350)	(0.169)	(0.323)
Social Father at Age 4					0.400*	-0.000			0.354+	0.131	0.279	0.302
					(0.193)	(0.492)			(0.209)	(0.496)	(0.198)	(0.545)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						-0.000				0.424		0.443
						(0.445)				(0.454)		(0.455)
Single Mother at Age 4 * Male						0.500				0.344		0.459
						(0.446)				(0.463)		(0.468)
Social Father at Age 4 * Male						1.000				0.447		0.098
						(0.788)				(0.774)		(0.847)
Father Absent at Birth * 2001 Birth Cohort						0.500				0.655		0.805+
						(0.431)				(0.442)		(0.426)
Single Mother at Age 4 * 2001 Birth Cohort						0.000				0.007		0.174
						(0.466)				(0.462)		(0.457)
Social Father at Age 4 * 2001 Birth Cohort						0.000				-0.088		-0.301
						(0.605)				(0.595)		(0.634)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.500				-0.785		-0.898
						(0.622)				(0.628)		(0.577)
Single Mother at Age 4 * Male * 2001 Birth Cohort						-0.000				-0.010		-0.085
						(0.656)				(0.660)		(0.634)
Social Father at Age 4 * Male * 2001 Birth Cohort						-0.500				-0.042		0.592
						(0.924)				(0.909)		(0.949)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.686**	0.622			0.519*	0.756+
							(0.233)	(0.485)			(0.216)	(0.445)
Pre-Term Birth (<37 weeks gestation)							-0.136	-0.178			-0.094	-0.358
							(0.195)	(0.290)			(0.188)	(0.287)
Asthma Diagnosis by Age 4 or 5							0.178	-0.244			0.125	-0.447
							(0.188)	(0.533)			(0.191)	(0.560)
Low Birth Weight * Male								0.444				0.161
								(0.449)				(0.459)
Pre-Term Birth * Male								0.089				0.232
								(0.401)				(0.397)
Asthma Diagnosis * Male								0.022				0.092
								(0.366)				(0.370)
Low Birth Weight * 2001 Cohort								-0.222				-0.491
								(0.522)				(0.505)
Pre-Term Birth * 2001 Cohort								0.022				0.343
								(0.378)				(0.388)
Asthma Diagnosis * 2001 Cohort								0.511				0.526
								(0.515)				(0.540)
Controls:												
Black		0.170	0.118	0.097	-0.000	0.000	0.068	0.089	-0.023	-0.095	-0.040	-0.052
		(0.173)	(0.173)	(0.168)	(0.164)	(0.174)	(0.168)	(0.187)	(0.162)	(0.176)	(0.180)	(0.178)
Hispanic		0.437+	0.350	0.370+	0.400*	0.500**	0.458*	0.489*	0.315+	0.286	0.284	0.358*
		(0.235)	(0.222)	(0.209)	(0.179)	(0.183)	(0.191)	(0.221)	(0.180)	(0.193)	(0.182)	(0.181)
Internalizing[1]		0.370*	0.357*	0.364**	0.400***	0.500***	0.424***	0.422***	0.423***	0.408***	0.451***	0.446***
		(0.167)	(0.141)	(0.134)	(0.106)	(0.109)	(0.099)	(0.100)	(0.111)	(0.091)	(0.081)	(0.082)
Mother's Age at Birth[1]		0.015	0.011	0.010	-0.000	0.000	0.017	0.022	0.015	0.020	0.034	0.041
		(0.018)	(0.020)	(0.020)	(0.020)	(0.023)	(0.022)	(0.022)	(0.022)	(0.020)	(0.023)	(0.025)
Birth Order		-0.067	-0.071	-0.043	-0.000	-0.000	-0.076	-0.067	-0.062	-0.054	-0.091+	-0.068
		(0.060)	(0.056)	(0.060)	(0.056)	(0.057)	(0.059)	(0.056)	(0.054)	(0.054)	(0.052)	(0.057)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		-0.067	-0.025	-0.030	0.200	0.500+	0.042	0.067	0.069	0.221	0.089	0.225
		(0.286)	(0.260)	(0.250)	(0.259)	(0.256)	(0.237)	(0.222)	(0.266)	(0.254)	(0.238)	(0.231)
Child Born 1985		-0.652*	-0.618+	-0.482	-0.400	0.000	-0.568+	-0.511+	-0.431	-0.376	-0.527+	-0.383
		(0.328)	(0.318)	(0.305)	(0.301)	(0.319)	(0.294)	(0.294)	(0.284)	(0.313)	(0.270)	(0.278)
Child Born 1986		-0.844*	-0.846*	-0.771*	-0.600+	-0.500	-0.839**	-0.822*	-0.708+	-0.690*	-0.783*	-0.713*
		(0.384)	(0.365)	(0.363)	(0.355)	(0.329)	(0.317)	(0.319)	(0.363)	(0.318)	(0.330)	(0.297)
Constant	7.000	7.308***	7.277***	7.285***	6.865***	6.831***	7.353***	7.296***	7.008***	7.302***	7.192***	7.488***
	(0.000)	(0.277)	(0.277)	(0.261)	(0.316)	(0.328)	(0.278)	(0.287)	(0.327)	(0.319)	(0.283)	(0.327)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.

Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.

Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table A.3: Potential Family and Health Mediators of the Gender Gap in the Location of the 50th Percentile of Externalizing Problems among Per Capita Household Income Quartile 1 Children Ages 4-5

VARIABLES	(1) NC:	(2) C:	(3) C + SES (I):	(4) C + SES (II):	(5) C +S (I):	(6) C + S (II):	(7) C + H (I):	(8) C + H (II):	(9) C + SES + S (I):	(10) C + SES + S (II):	(11) C + SES + S + H (I):	(12) C + SES + S + H (II):
2001 Birth Cohort	-0.000	-0.000	0.085	-0.037	-0.000	0.500	-0.073	-0.228	0.096	-0.067	-0.170	-0.105
	(0.494)	(0.233)	(0.228)	(0.264)	(0.241)	(0.413)	(0.253)	(0.278)	(0.239)	(0.426)	(0.250)	(4.013)
Male	-0.000	-0.000	0.161	0.112	0.500+	0.500	0.309	0.198	0.416+	-0.023	0.361	0.192
	(0.506)	(0.282)	(0.267)	(0.326)	(0.264)	(0.444)	(0.242)	(0.257)	(0.250)	(0.493)	(0.225)	(187.217)
2001 Birth Cohort * Male	1.000	1.000**	0.732*	0.717*	0.500	-0.000	0.442	0.418	0.448	0.669	0.507+	0.348
	(0.706)	(0.355)	(0.320)	(0.365)	(0.318)	(0.510)	(0.304)	(0.344)	(0.299)	(0.573)	(0.273)	(75.933)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth of Child[1]			-0.037	0.025					-0.045	0.038	-0.057	0.013
			(0.040)	(0.085)					(0.038)	(0.095)	(0.038)	(21.971)
Mother's School * Male				-0.091						-0.083		-0.044
				(0.124)						(0.141)		(55.008)
Mother's School * 2001 Cohort				-0.047						-0.055		-0.033
				(0.096)						(0.113)		(32.817)
Mother's School * Male * 2001 Cohort				0.006						-0.015		-0.016
				(0.152)						(0.175)		(67.151)
Family Structure:												
Father Absent at Birth					-0.000	-0.000			-0.013	-0.093	-0.090	-0.045
					(0.171)	(0.349)			(0.165)	(0.338)	(0.159)	(150.467)
Single Mother at Age 4					0.500**	0.500			0.331+	0.135	0.353*	0.344
					(0.194)	(0.371)			(0.187)	(0.363)	(0.172)	(31.173)
Social Father at Age 4					0.500*	0.500			0.266	0.156	0.262	0.110
					(0.235)	(0.617)			(0.256)	(0.618)	(0.226)	(851.918)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						0.000				0.010		-0.054
						(0.496)				(0.496)		(223.296)
Single Mother at Age 4 * Male						-0.000				0.377		0.172
						(0.557)				(0.567)		(24.373)
Social Father at Age 4 * Male						-0.500				0.052		0.212
						(0.908)				(0.915)		(2,432.734)
Father Absent at Birth * 2001 Birth Cohort						0.000				0.301		0.338
						(0.446)				(0.432)		(192.847)
Single Mother at Age 4 * 2001 Birth Cohort						-0.500				-0.204		-0.459
						(0.463)				(0.457)		(65.020)
Social Father at Age 4 * 2001 Birth Cohort						-0.500				-0.225		-0.058
						(0.738)				(0.731)		(1,058.321)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.500				-0.781		-0.793
						(0.629)				(0.628)		(269.578)
Single Mother at Age 4 * Male * 2001 Birth Cohort						1.000				0.483		0.544
						(0.708)				(0.709)		(56.301)
Social Father at Age 4 * Male * 2001 Birth Cohort						1.000				0.522		0.171
						(1.059)				(1.061)		(2,739.621)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.558*	0.983			0.485*	1.037
							(0.226)	(0.615)			(0.237)	(6.573e+15)
Pre-Term Birth (<37 weeks gestation)							0.333+	-0.162			0.369+	-0.221
							(0.182)	(0.390)			(0.200)	(6.573e+15)
Asthma Diagnosis by Age 4 or 5							0.194	-0.401			0.196	-0.268
							(0.188)	(0.613)			(0.180)	(656.294)
Low Birth Weight * Male								0.150				-0.045
								(0.471)				(528.327)
Pre-Term Birth * Male								0.435				0.370
								(0.397)				(454.842)
Asthma Diagnosis * Male								-0.128				-0.067
								(0.349)				(397.557)
Low Birth Weight * 2001 Cohort								-0.624				-0.690
								(0.644)				(6.573e+15)
Pre-Term Birth * 2001 Cohort								0.370				0.455
								(0.457)				(6.573e+15)
Asthma Diagnosis * 2001 Cohort								0.724				0.667
								(0.582)				(345.420)
Controls:												
Black		-0.000	0.014	0.003	0.000	0.000	-0.030	-0.058	0.018	-0.031	-0.143	-0.123
		(0.139)	(0.127)	(0.146)	(0.165)	(0.168)	(0.162)	(0.155)	(0.154)	(0.182)	(0.180)	(16.101)
Hispanic		0.000	0.128	0.188	0.500*	0.500*	0.376*	0.409*	0.368+	0.291	0.351+	0.404
		(0.219)	(0.202)	(0.205)	(0.199)	(0.206)	(0.188)	(0.196)	(0.197)	(0.195)	(0.189)	(33.723)
Internalizing[1]		0.500***	0.528***	0.533***	0.500***	0.500***	0.545***	0.591***	0.550***	0.561***	0.577***	0.550
		(0.083)	(0.079)	(0.072)	(0.084)	(0.086)	(0.092)	(0.094)	(0.079)	(0.080)	(0.090)	(0.461)
Mother's Age at Birth[1]		0.000	0.008	0.004	-0.000	-0.000	0.024	0.025	0.010	0.021	0.029	0.037
		(0.020)	(0.020)	(0.021)	(0.023)	(0.023)	(0.023)	(0.022)	(0.025)	(0.025)	(0.024)	(4.833)
Birth Order		-0.000	0.033	0.038	0.000	0.000	0.067	0.064	0.048	0.052	0.062	0.071
		(0.061)	(0.054)	(0.056)	(0.055)	(0.060)	(0.051)	(0.044)	(0.059)	(0.055)	(0.054)	(10.144)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		-0.000	-0.014	-0.024	-0.000	0.000	0.042	-0.003	-0.064	-0.000	-0.068	-0.026
		(0.293)	(0.264)	(0.250)	(0.258)	(0.295)	(0.264)	(0.262)	(0.260)	(0.275)	(0.270)	(27.155)
Child Born 1985		0.000	-0.383	-0.496	-0.500	-0.500	-0.455	-0.479	-0.515	-0.415	-0.464	-0.445
		(0.423)	(0.418)	(0.431)	(0.400)	(0.419)	(0.424)	(0.378)	(0.394)	(0.410)	(0.389)	(29.610)
Child Born 1986		-0.000	-0.184	-0.339	-0.500	-0.500	-0.388	-0.588	-0.490	-0.509	-0.707+	-0.730
		(0.452)	(0.397)	(0.420)	(0.418)	(0.399)	(0.422)	(0.417)	(0.398)	(0.392)	(0.381)	(33.456)
Constant	8.000***	8.331***	8.174***	8.287***	7.831***	7.831***	8.016***	8.226***	7.856***	8.266***	7.920***	8.047
	(0.100)	(0.270)	(0.254)	(0.252)	(0.281)	(0.364)	(0.264)	(0.253)	(0.269)	(0.372)	(0.281)	(85.877)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.

Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.

Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table A.4: Potential Family and Health Mediators of the Gender Gap in the Location of the 10th Percentile of Externalizing Problems among Per Capita Income Quartile 1 Children Ages 4-5, Controlling for Cognitive Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	NC:	C:	C + SES (I):	C + SES (II):	C +S (I):	C + S (II):	C + H (I):	C + H (II):	C + SES + S (I):	C + SES + S (II):	C + SES + S + H (I):	C + SES + S + H (II):
2001 Birth Cohort	0.000	-0.000	-0.000	-0.000	0.059	-0.169	-0.043	-0.075	0.063	-0.252	-0.023	-0.170
	(0.118)	(0.285)	(0.309)	(0.263)	(0.235)	(0.282)	(0.225)	(0.221)	(0.217)	(0.312)	(0.218)	(6.845e+10
Male	0.000	0.500*	0.500*	0.500*	0.499*	-0.045	0.463*	0.291	0.461*	-0.045	0.485*	-0.166
	(0.412)	(0.231)	(0.218)	(0.227)	(0.205)	(0.259)	(0.206)	(0.230)	(0.201)	(0.280)	(0.191)	(0.342)
2001 Birth Cohort * Male	1.000*	0.000	0.000	0.000	-0.013	0.551	0.081	-0.017	0.012	0.554	0.035	0.289
	(0.482)	(0.373)	(0.377)	(0.337)	(0.296)	(0.381)	(0.290)	(0.310)	(0.289)	(0.376)	(0.255)	(6.845e+10
Socio-Economic Status (SES):												
Mother's Years of Schooling			-0.000	0.000					-0.014	0.013	-0.026	0.008
at Birth[1]			(0.025)	(0.046)					(0.027)	(0.049)	(0.027)	(0.114)
Mother's School * Male				-0.000						-0.027		-0.064
				(0.065)						(0.071)		(0.123)
Mother's School * 2001				-0.000						-0.054		-0.039
Cohort				(0.076)						(166.773)		(0.126)
Mother's School * Male *				0.000						-0.015		-0.017
2001 Cohort				(0.114)						(166.762)		(0.141)
Family Structure:												
Father Absent at Birth					-0.031	-0.419			-0.036	-0.440+	-0.090	-0.410
					(0.113)	(0.267)			(0.118)	(0.261)	(0.128)	(0.362)
Single Mother at Age 4					0.099	0.167			0.078	0.105	0.086	0.279
					(0.147)	(0.248)			(0.131)	(0.252)	(0.137)	(0.436)
Social Father at Age 4					0.246	0.586			0.222	0.546	0.305	0.685
					(0.213)	(0.480)			(0.207)	(107.948)	(0.189)	(0.543)
Two Biological Parents at Age					ref	ref			ref	ref	ref	ref
4 (=reference)												
Father Absent at Birth * Male						0.555				0.468		0.580
						(0.391)				(0.383)		(0.481)
Single Mother at Age 4 *						0.197				0.240		0.168
Male						(0.385)				(0.406)		(0.463)
Social Father at Age 4 * Male						-0.259				-0.272		-0.310
						(0.776)				(0.787)		(0.940)
Father Absent at Birth * 2001						0.432				0.446		0.356
Birth Cohort						(0.340)				(0.324)		(0.415)
Single Mother at Age 4 *						-0.148				-0.131		-0.246
2001 Birth Cohort						(0.323)				(274.767)		(6.845e+10
Social Father at Age 4 * 2001						-0.146				-0.108		-0.365
Birth Cohort						(0.577)				(0.561)		(6.845e+10
Father Absent at Birth * Male						-0.592				-0.529		-0.766
* 2001 Birth Cohort						(0.560)				(0.553)		(0.613)
Single Mother at Age 4 *						-0.007				-0.098		-0.072
Male * 2001 Birth Cohort						(0.574)				(274.744)		(6.845e+10
Social Father at Age 4 * Male						0.076				0.023		0.280
* 2001 Birth Cohort						(0.986)				(107.959)		(6.845e+10
Early Childhood Health:												
Low Birth Weight							0.146	0.049			0.169	0.310
(<5.5 pounds, 2,500 g)							(0.179)	(0.416)			(0.162)	(0.406)
Pre-Term Birth (<37 weeks							0.074	-0.167			0.023	-0.270
gestation)							(0.116)	(0.287)			(0.130)	(0.469)
Asthma Diagnosis by Age 4 or							0.108	-0.038			0.150	-0.420
5							(0.122)	(0.451)			(0.146)	(0.503)
Low Birth Weight * Male								0.100				0.152
								(0.383)				(0.342)
Pre-Term Birth * Male								0.264				0.397
								(0.318)				(0.317)
Asthma Diagnosis * Male								0.097				0.162
								(0.328)				(0.332)
Low Birth Weight * 2001								0.082				-0.205
Cohort								(0.446)				(0.427)
Pre-Term Birth * 2001 Cohort								0.202				0.258
								(0.315)				(0.487)
Asthma Diagnosis * 2001								0.123				0.546
Cohort								(0.440)				(0.472)
Controls:												
Receptive Vocabulary		0.000	0.000	0.000	-0.057	-0.071	-0.051	-0.085	-0.055	-0.080	-0.079	-0.060
(Cognitive Dev.)[1]		(0.070)	(0.065)	(0.065)	(0.071)	(0.075)	(0.056)	(0.061)	(0.070)	(0.079)	(0.059)	(0.069)
Black		0.000	0.000	0.000	-0.000	0.040	-0.001	-0.029	0.000	0.094	0.018	0.013
		(0.087)	(0.092)	(0.101)	(0.167)	(0.153)	(0.101)	(0.103)	(0.154)	(0.160)	(0.152)	(0.156)
Hispanic		0.000	0.000	0.000	0.153	0.263	0.209	0.189	0.148	0.243	0.194	0.312
		(0.193)	(0.176)	(0.156)	(0.167)	(0.176)	(0.161)	(0.189)	(0.170)	(0.179)	(0.164)	(0.196)
Internalizing[1]		0.500***	0.500**	0.500***	0.384***	0.292*	0.326**	0.354**	0.386***	0.288*	0.306***	0.308**
		(0.150)	(0.152)	(0.126)	(0.110)	(0.120)	(0.118)	(0.123)	(0.106)	(0.112)	(0.092)	(0.098)
Mother's Age at Birth[1]		-0.000	-0.000	-0.000	0.005	0.009	0.004	0.000	0.008	0.014	0.024	0.010
		(0.016)	(0.017)	(0.018)	(0.020)	(0.018)	(0.021)	(0.019)	(0.020)	(0.024)	(0.021)	(0.022)
Birth Order		0.000	0.000	0.000	-0.032	-0.035	-0.047	-0.055	-0.042	-0.060	-0.080	-0.065
		(0.043)	(0.050)	(0.050)	(0.045)	(0.045)	(0.048)	(0.049)	(0.048)	(0.050)	(0.049)	(0.048)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.000	0.000	0.000	0.123	0.034	0.055	0.092	0.002	0.046	-0.001	0.033
		(0.301)	(0.313)	(0.274)	(0.281)	(0.240)	(0.249)	(0.258)	(0.256)	(0.213)	(0.246)	(0.227)
Child Born 1985		-0.500+	-0.500+	-0.500*	-0.365	-0.275	-0.423+	-0.305	-0.326	-0.268	-0.271	-0.317
		(0.294)	(0.298)	(0.254)	(0.263)	(0.264)	(0.242)	(0.251)	(0.245)	(0.244)	(0.245)	(0.251)
Child Born 1986		-0.500+	-0.500+	-0.500*	-0.465*	-0.451+	-0.602*	-0.455	-0.418+	-0.492+	-0.571*	-0.464
		(0.259)	(0.267)	(0.232)	(0.236)	(0.268)	(0.248)	(0.297)	(0.231)	(0.260)	(0.232)	(0.296)
Constant	6.000	6.331***	6.331***	6.331***	6.240***	6.429***	6.331***	6.433***	6.279***	6.522***	6.322***	6.450***
	(0.000)	(0.257)	(0.265)	(0.260)	(0.245)	(0.301)	(0.241)	(0.243)	(0.224)	(0.334)	(0.251)	(0.385)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table A.5: Potential Family and Health Mediators of the Gender Gap in the Location of the 25th Percentile of Externalizing Problems among Per Capita Income Quartile 1 Children Ages 4-5, Controlling for Cognitive Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	NC:	C:	C + SES (I):	C + SES (II):	C +S (I):	C + S (II):	C + H (I):	C + H (II):	C + SES + S (I):	C + SES + S (II):	C + SES + S + H (I):	C + SES + S + H (II):
2001 Birth Cohort	0.000	0.088	0.089	-0.026	0.019	-0.434	-0.192	-0.172	0.038	-0.559	-0.138	-0.656
	(0.000)	(0.236)	(0.241)	(0.279)	(0.231)	(0.346)	(0.261)	(0.291)	(0.247)	(0.351)	(0.257)	(3.975e+14)
Male	0.000	0.303	0.304	0.248	0.264	-0.185	0.260	0.195	0.238	-0.196	0.280	-0.354
	(0.371)	(0.213)	(0.218)	(0.247)	(0.175)	(0.282)	(0.199)	(0.196)	(0.179)	(0.323)	(0.194)	(57.190)
2001 Birth Cohort * Male	1.000**	0.372	0.373	0.485	0.448+	0.841*	0.358	0.352	0.479+	0.913*	0.425+	0.758
	(0.372)	(0.279)	(0.286)	(0.320)	(0.240)	(0.371)	(0.270)	(0.273)	(0.246)	(0.415)	(0.251)	(3.975e+14)
Socio-Economic Status (SES):												
Mother's Years of Schooling			-0.007	0.020					-0.009	0.023	0.011	0.018
at Birth[1]			(0.039)	(0.070)					(0.039)	(0.074)	(0.037)	(7.463)
Mother's School * Male				-0.032						-0.013		-0.013
				(0.097)						(0.093)		(7.982)
Mother's School * 2001 Cohort				-0.082						-0.069		-0.019
				(0.095)						(0.095)		(13.080)
Mother's School * Male * 2001 Cohort				0.100						0.039		-0.031
				(0.139)						(0.145)		(17.065)
Family Structure:												
Father Absent at Birth					0.084	-0.313			0.093	-0.244	0.103	-0.379
					(0.138)	(0.318)			(0.142)	(0.337)	(0.152)	(12.407)
Single Mother at Age 4					0.355*	-0.105			0.325+	-0.131	0.316*	-0.134
					(0.159)	(0.335)			(0.168)	(0.342)	(0.160)	(11.588)
Social Father at Age 4					0.217	0.174			0.225	0.128	0.279	0.186
					(0.186)	(0.444)			(0.177)	(0.473)	(0.180)	(255.811)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						0.329				0.243		0.341
						(0.455)				(0.427)		(9.870)
Single Mother at Age 4 * Male						0.600				0.643		0.684
						(0.456)				(0.433)		(15.039)
Social Father at Age 4 * Male						0.226				0.252		0.283
						(0.701)				(0.744)		(184.196)
Father Absent at Birth * 2001 Birth Cohort						0.683+				0.588		0.756
						(0.409)				(0.411)		(31.617)
Single Mother at Age 4 * 2001 Birth Cohort						0.418				0.520		0.357
						(0.450)				(0.461)		(3.975e+14)
Social Father at Age 4 * 2001 Birth Cohort						-0.021				0.043		-0.186
						(0.545)				(0.565)		(3.975e+14)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.664				-0.551		-0.626
						(0.593)				(0.587)		(57.510)
Single Mother at Age 4 * Male * 2001 Birth Cohort						-0.350				-0.490		-0.421
						(0.625)				(0.620)		(3.975e+14)
Social Father at Age 4 * Male * 2001 Birth Cohort						0.098				0.046		0.347
						(0.832)				(0.868)		(3.975e+14)
Early Childhood Health:												
Low Birth Weight							0.557*	0.608			0.475*	0.926
(<5.5 pounds, 2,500 g)							(0.226)	(0.487)			(0.224)	(22.526)
Pre-Term Birth (<37 weeks							-0.093	-0.099			-0.089	-0.489
gestation)							(0.195)	(0.258)			(0.189)	(1.499)
Asthma Diagnosis by Age 4 or							0.196	-0.282			0.106	-0.565
5							(0.177)	(0.489)			(0.171)	(68.425)
Low Birth Weight * Male								0.297				-0.067
								(0.426)				(15.524)
Pre-Term Birth * Male								0.043				0.402
								(0.379)				(13.943)
Asthma Diagnosis * Male								0.005				0.057
								(0.354)				(11.494)
Low Birth Weight * 2001 Cohort								-0.386				-0.670
								(0.530)				(40.864)
Pre-Term Birth * 2001 Cohort								0.083				0.448
								(0.380)				(14.989)
Asthma Diagnosis * 2001 Cohort								0.535				0.725
								(0.445)				(58.133)
Controls:												
Receptive Vocabulary		-0.240**	-0.238**	-0.232**	-0.196**	-0.225**	-0.207**	-0.233**	-0.201**	-0.238**	-0.213**	-0.224
(Cognitive Dev.)[1]		(0.090)	(0.088)	(0.083)	(0.069)	(0.074)	(0.074)	(0.071)	(0.076)	(0.076)	(0.069)	(1.386)
Black		0.059	0.067	0.089	-0.056	-0.064	0.001	-0.042	-0.044	-0.120	-0.078	-0.101
		(0.161)	(0.156)	(0.159)	(0.155)	(0.166)	(0.173)	(0.166)	(0.172)	(0.174)	(0.181)	(0.779)
Hispanic		0.344+	0.336+	0.371*	0.423*	0.377*	0.377*	0.333+	0.365*	0.321+	0.407*	0.358
		(0.179)	(0.177)	(0.175)	(0.166)	(0.165)	(0.181)	(0.184)	(0.175)	(0.176)	(0.170)	(7.101)
Internalizing[1]		0.417***	0.419***	0.412***	0.428***	0.444***	0.388***	0.400***	0.435***	0.463***	0.442***	0.450
		(0.112)	(0.109)	(0.095)	(0.087)	(0.086)	(0.082)	(0.086)	(0.088)	(0.087)	(0.080)	(1.382)
Mother's Age at Birth[1]		0.006	0.007	0.009	0.033	0.045*	0.019	0.023	0.034	0.036	0.036	0.058
		(0.020)	(0.021)	(0.022)	(0.023)	(0.022)	(0.021)	(0.022)	(0.023)	(0.025)	(0.022)	(0.772)
Birth Order		-0.064	-0.069	-0.072	-0.083	-0.082	-0.068	-0.080	-0.084	-0.065	-0.084	-0.091
		(0.057)	(0.059)	(0.053)	(0.052)	(0.057)	(0.056)	(0.056)	(0.053)	(0.054)	(0.055)	(0.387)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.048	0.030	-0.010	0.079	0.132	-0.021	0.036	0.114	0.135	0.068	0.136
		(0.249)	(0.243)	(0.248)	(0.242)	(0.242)	(0.234)	(0.233)	(0.241)	(0.247)	(0.235)	(30.402)
Child Born 1985		-0.356	-0.366	-0.390	-0.420+	-0.453+	-0.374	-0.353	-0.349	-0.436	-0.409	-0.409
		(0.277)	(0.260)	(0.283)	(0.245)	(0.266)	(0.267)	(0.257)	(0.252)	(0.299)	(0.258)	(11.051)
Child Born 1986		-0.557+	-0.535+	-0.553+	-0.621*	-0.705*	-0.696*	-0.659*	-0.526+	-0.668+	-0.771**	-0.642
		(0.319)	(0.314)	(0.331)	(0.315)	(0.291)	(0.322)	(0.307)	(0.315)	(0.343)	(0.293)	(35.137)
Constant	7.000	7.107***	7.111***	7.176***	7.022***	7.445***	7.237***	7.286***	6.997***	7.488***	7.060***	7.646
	(0.000)	(0.274)	(0.277)	(0.286)	(0.284)	(0.340)	(0.278)	(0.311)	(0.293)	(0.324)	(0.303)	(71.712)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

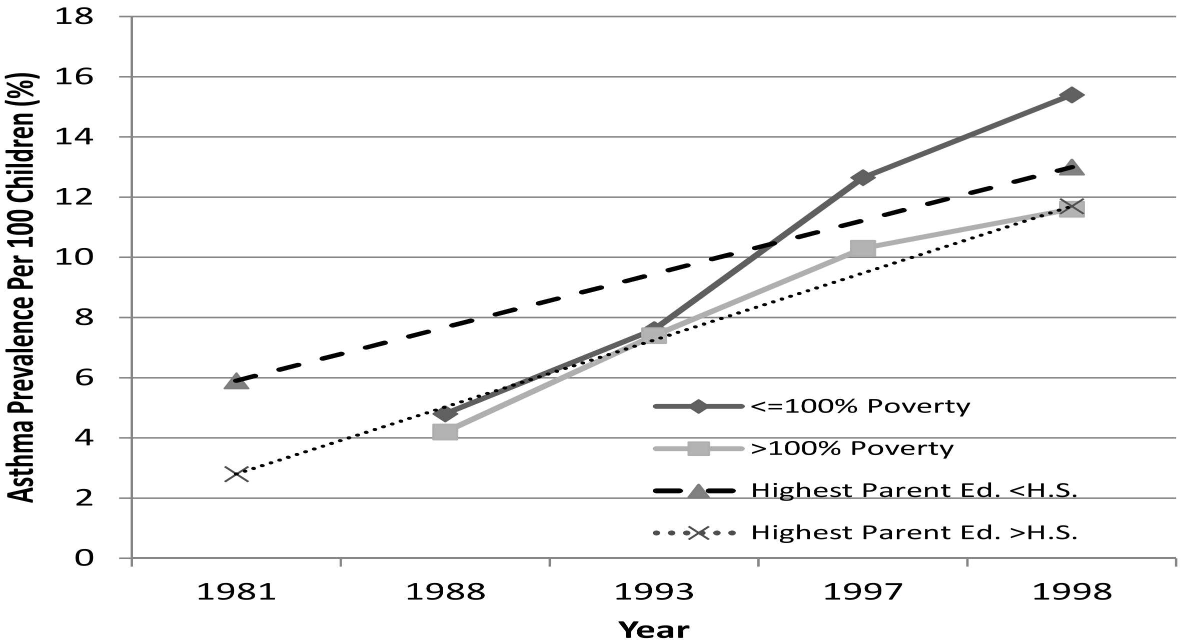
[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table A.6: Potential Family and Health Mediators of the Gender Gap in the Location of the 50th Percentile of Externalizing Problems among Per Capita Income Quartile 1 Children Ages 4-5, Controlling for Cognitive Development

VARIABLES	(1) NC:	(2) C:	(3) C + SES (I):	(4) C + SES (II):	(5) C +S (I):	(6) C + S (II):	(7) C + H (I):	(8) C + H (II):	(9) C + SES + S (I):	(10) C + SES + S (II):	(11) C + SES + S + H (I):	(12) C + SES + S + H (II):
2001 Birth Cohort	-0.000	0.323	0.356+	0.276	0.195	0.181	-0.004	-0.016	0.294	0.039	0.122	-0.171
	(0.499)	(0.217)	(0.214)	(0.492)	(0.195)	(0.381)	(0.256)	(0.257)	(0.204)	(1.159)	(0.238)	(0.506)
Male	-0.000	0.360	0.388+	0.257	0.415+	0.173	0.294	0.315	0.393	-0.000	0.416+	0.098
	(0.505)	(0.238)	(0.227)	(0.521)	(0.221)	(0.435)	(0.239)	(0.237)	(0.240)	(1.961)	(0.216)	(0.523)
2001 Birth Cohort * Male	1.000	0.286	0.254	0.352	0.268	0.385	0.416	0.320	0.307	0.604	0.287	0.484
	(0.723)	(0.297)	(0.279)	(0.541)	(0.260)	(0.500)	(0.285)	(0.281)	(0.277)	(0.557)	(0.270)	(0.606)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth[1]			-0.031	-0.013					-0.042	0.028	-0.056	-0.003
			(0.036)	(0.090)					(0.035)	(0.133)	(0.039)	(0.094)
Mother's School * Male				-0.064						-0.067		-0.019
				(0.116)						(0.120)		(0.143)
Mother's School * 2001 Cohort				-0.016						-0.047		-0.019
				(0.099)						(0.216)		(0.107)
Mother's School * Male * 2001 Cohort				0.014						0.024		-0.008
				(0.152)						(0.651)		(0.189)
Family Structure:												
Father Absent at Birth					-0.033	-0.175			-0.026	-0.293	-0.107	-0.149
					(0.150)	(0.307)			(0.150)	(0.560)	(0.154)	(0.573)
Single Mother at Age 4					0.283+	0.196			0.283+	0.251	0.335*	0.197
					(0.158)	(0.360)			(0.159)	(1.585)	(0.171)	(0.995)
Social Father at Age 4					0.141	0.089			0.181	0.304	0.226	-0.061
					(0.228)	(0.580)			(0.208)	(2.974)	(0.212)	(1.328)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						0.294				0.339		0.133
						(0.470)				(0.515)		(1.050)
Single Mother at Age 4 * Male						0.478				0.346		0.349
						(0.524)				(1.821)		(1.488)
Social Father at Age 4 * Male						-0.234				-0.314		0.112
						(0.948)				(0.951)		(1.873)
Father Absent at Birth * 2001 Birth Cohort						0.381				0.494		0.461
						(0.385)				(5.459)		(0.897)
Single Mother at Age 4 * 2001 Birth Cohort						-0.143				-0.125		-0.228
						(0.470)				(4.395)		(1.281)
Social Father at Age 4 * 2001 Birth Cohort						-0.116				-0.266		-0.018
						(0.711)				(3.133)		(1.638)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.946				-1.001		-0.914
						(0.577)				(5.290)		(1.557)
Single Mother at Age 4 * Male * 2001 Birth Cohort						0.205				0.227		0.412
						(0.660)				(4.889)		(2.025)
Social Father at Age 4 * Male * 2001 Birth Cohort						0.738				0.688		0.503
						(1.052)				(6.824)		(2.221)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.297	0.962+			0.286	1.143
							(0.223)	(0.546)			(0.222)	(3.284e+12
Pre-Term Birth (<37 weeks gestation)							0.305+	-0.187			0.400*	-0.311
							(0.168)	(0.361)			(0.185)	(3.284e+12
Asthma Diagnosis by Age 4 or 5							0.239	-0.500			0.170	-0.441
							(0.162)	(0.556)			(0.156)	(3.284e+12
Low Birth Weight * Male								0.125				-0.068
								(0.419)				(0.681)
Pre-Term Birth * Male								0.281				0.294
								(0.341)				(0.455)
Asthma Diagnosis * Male								-0.268				-0.252
								(0.321)				(0.495)
Low Birth Weight * 2001 Cohort								-0.884				-1.045
								(0.568)				(3.284e+12
Pre-Term Birth * 2001 Cohort								0.424				0.616
								(0.420)				(3.284e+12
Asthma Diagnosis * 2001 Cohort								0.935+				0.868
								(0.539)				(3.284e+12
Controls:												
Receptive Vocabulary (Cognitive Dev.)[1]		-0.302***	-0.299***	-0.298***	-0.268***	-0.281***	-0.261***	-0.274***	-0.266***	-0.281***	-0.253***	-0.294***
		(0.082)	(0.071)	(0.070)	(0.062)	(0.063)	(0.064)	(0.067)	(0.062)	(0.073)	(0.065)	(0.071)
Black		-0.070	-0.045	-0.052	-0.081	-0.074	-0.066	-0.025	-0.088	-0.096	-0.156	-0.147
		(0.143)	(0.145)	(0.153)	(0.172)	(0.169)	(0.142)	(0.134)	(0.160)	(0.218)	(0.170)	(0.212)
Hispanic		0.254	0.246	0.248	0.332+	0.378*	0.343*	0.433**	0.240	0.317	0.290	0.390+
		(0.178)	(0.179)	(0.206)	(0.172)	(0.177)	(0.173)	(0.168)	(0.174)	(1.233)	(0.193)	(0.201)
Internalizing[1]		0.606***	0.598***	0.589***	0.601***	0.580***	0.633***	0.624***	0.609***	0.586***	0.621***	0.605***
		(0.078)	(0.078)	(0.114)	(0.081)	(0.079)	(0.080)	(0.080)	(0.077)	(0.085)	(0.080)	(0.090)
Mother's Age at Birth[1]		0.018	0.022	0.029	0.024	0.027	0.023	0.028	0.030	0.028	0.034	0.030
		(0.024)	(0.025)	(0.040)	(0.023)	(0.023)	(0.021)	(0.023)	(0.024)	(0.029)	(0.024)	(0.025)
Birth Order		0.051	0.038	0.022	0.055	0.045	0.049	0.038	0.051	0.070	0.022	0.020
		(0.048)	(0.047)	(0.066)	(0.048)	(0.048)	(0.045)	(0.048)	(0.052)	(0.070)	(0.054)	(0.060)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.083	0.004	0.016	-0.055	-0.023	0.056	0.002	-0.024	0.035	-0.023	-0.091
		(0.258)	(0.258)	(0.259)	(0.239)	(0.263)	(0.267)	(0.232)	(0.228)	(0.377)	(0.226)	(0.360)
Child Born 1985		-0.362	-0.340	-0.472	-0.475	-0.456	-0.413	-0.518	-0.371	-0.541	-0.312	-0.420
		(0.360)	(0.361)	(0.366)	(0.342)	(0.390)	(0.366)	(0.325)	(0.346)	(0.396)	(0.345)	(0.421)
Child Born 1986		-0.361	-0.385	-0.437	-0.526	-0.716+	-0.250	-0.374	-0.418	-0.700+	-0.523	-0.639
		(0.402)	(0.425)	(0.399)	(0.383)	(0.390)	(0.434)	(0.415)	(0.380)	(0.401)	(0.412)	(0.391)
Constant	8.000***	8.014***	8.000***	8.123***	7.968***	8.064***	8.034***	8.093***	7.857***	8.076***	7.858***	8.174***
	(0.100)	(0.215)	(0.206)	(0.504)	(0.211)	(0.315)	(0.256)	(0.243)	(0.222)	(1.221)	(0.252)	(0.530)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Figure A.1: Asthma Prevalence among Children 3-17 Years, by Parental Education and Poverty Status for Selected NHIS Survey Years 1981-1998



Sources: [1]Wetizman, M., Gortmaker, S., and Sobol A. 1990. Racial, social, and environmental risks for childhood asthma. *Am J Dis Child* 144(11): 1189-1194.
[2]Halfon, N. and Newacheck, P. 1993. Childhood asthma and poverty: differential impacts and utilization of health services. *Pediatrics* 91(1): 56-61.
[3]Akinbami, L.J., LaFleur, B.J., Schoendorf, K.C. 2002. Racial and income disparities in childhood asthma in the United States. *Ambulatory Pediatrics* 2(5): 382-387.
[4]Smith, L. A., Hatcher-Ross, J. L., Wertheimer, R., & Kahn, R. S. 2005. Rethinking race/ethnicity, income, and childhood asthma: racial/ethnic disparities concentrated among the very poor. *Public health reports* 120(2), 109.
[5]Blackwell, DL and Tonthat, L. 2002. Summary health statistics for U.S. children: National Health Interview Survey, 1998. *Vital Health Stat 10* 208: 1-46.

Figure A.2: Counts (N's) at Each Percentile of Externalizing, by Gender, SES, and Time Period

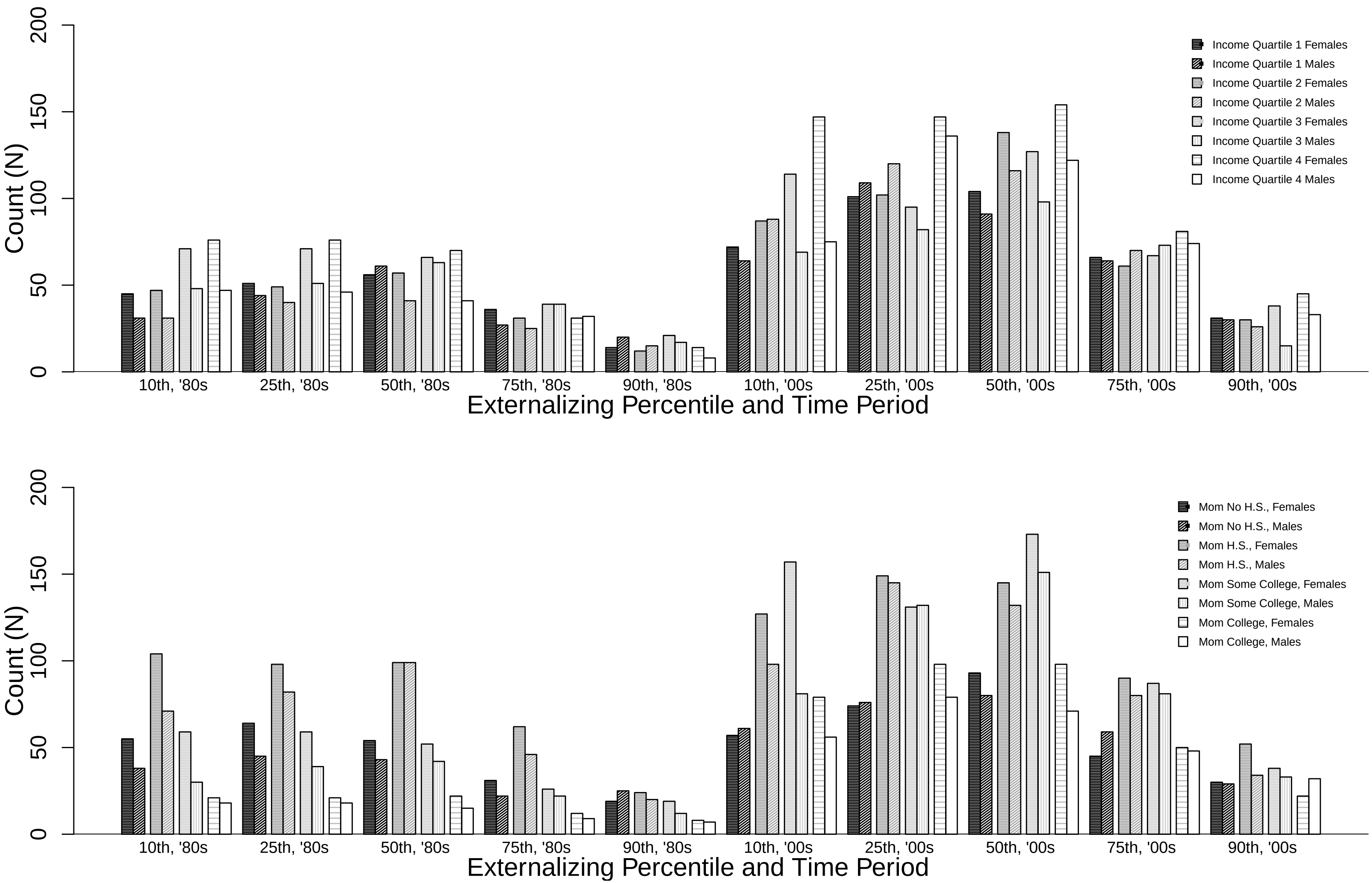


Figure A.3: Means and 95% Confidence Intervals of Predictor Variables, by Per Capita Household Income Quartile, Gender, and Time Period, at Each Sub-Group's Respective 10th Percentile of Externalizing Score

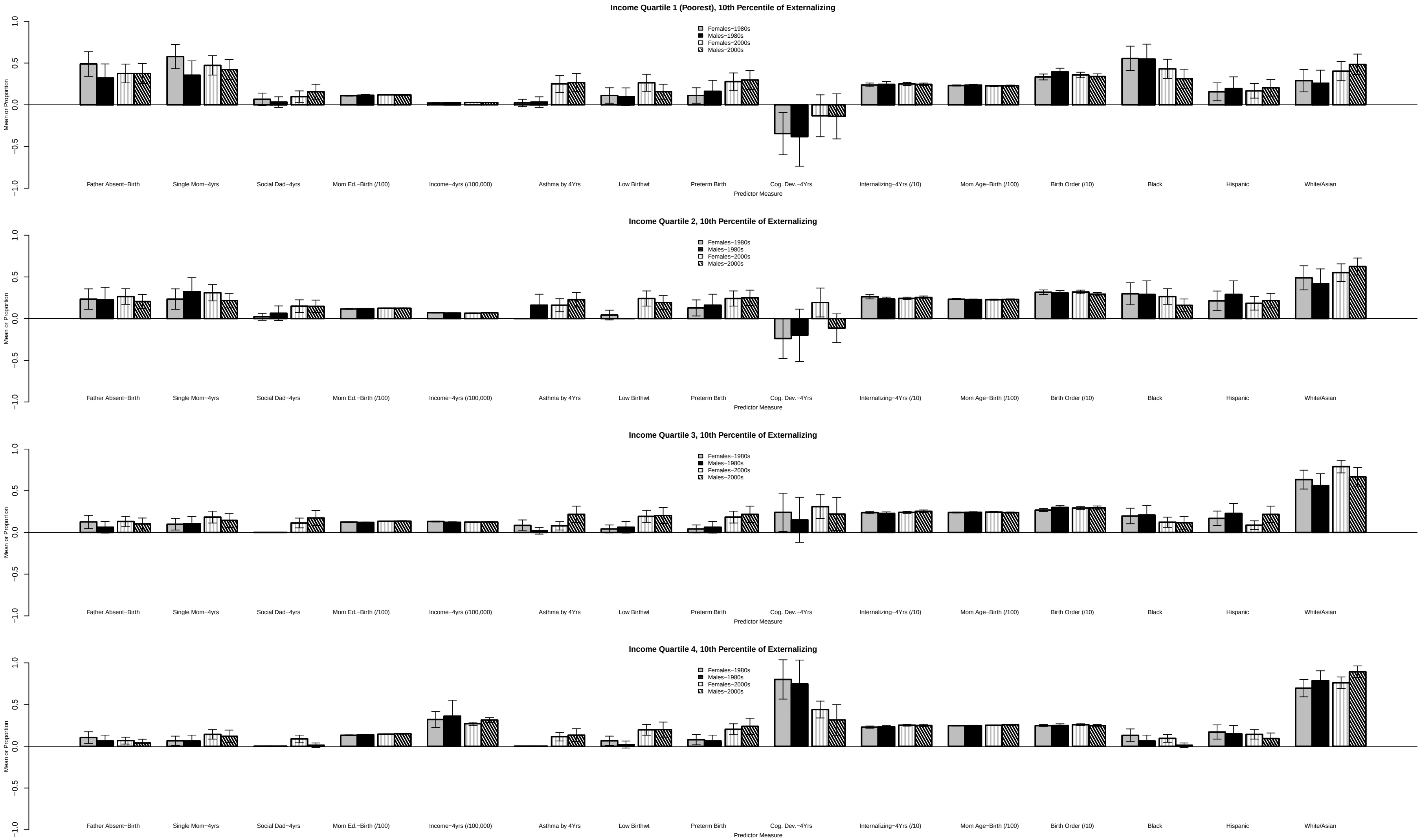


Figure A.4: Means and 95% Confidence Intervals of Predictor Variables, by Per Capita Household Income Quartile, Gender, and Time Period, at Each Sub-Group's Respective 25th Percentile of Externalizing Score

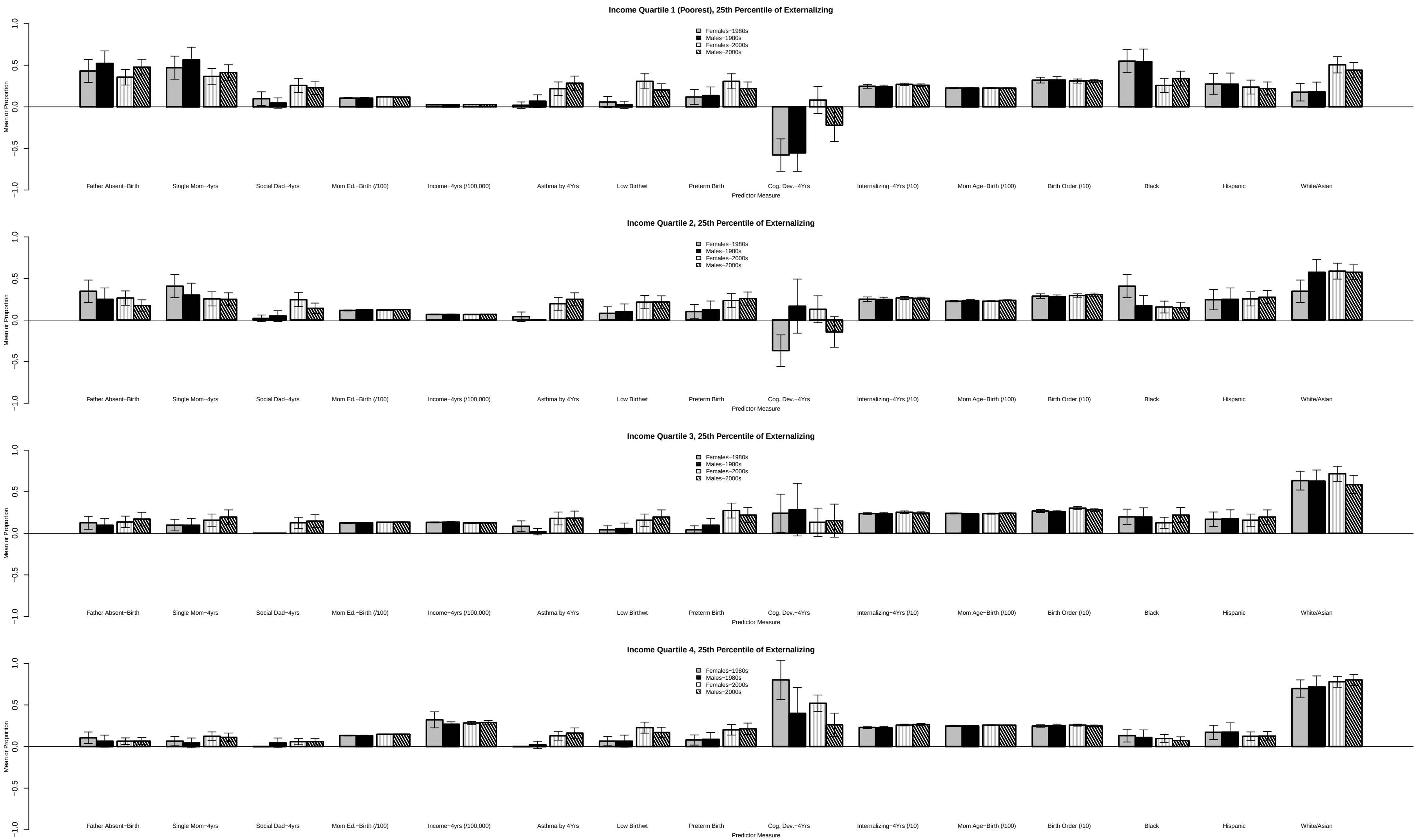
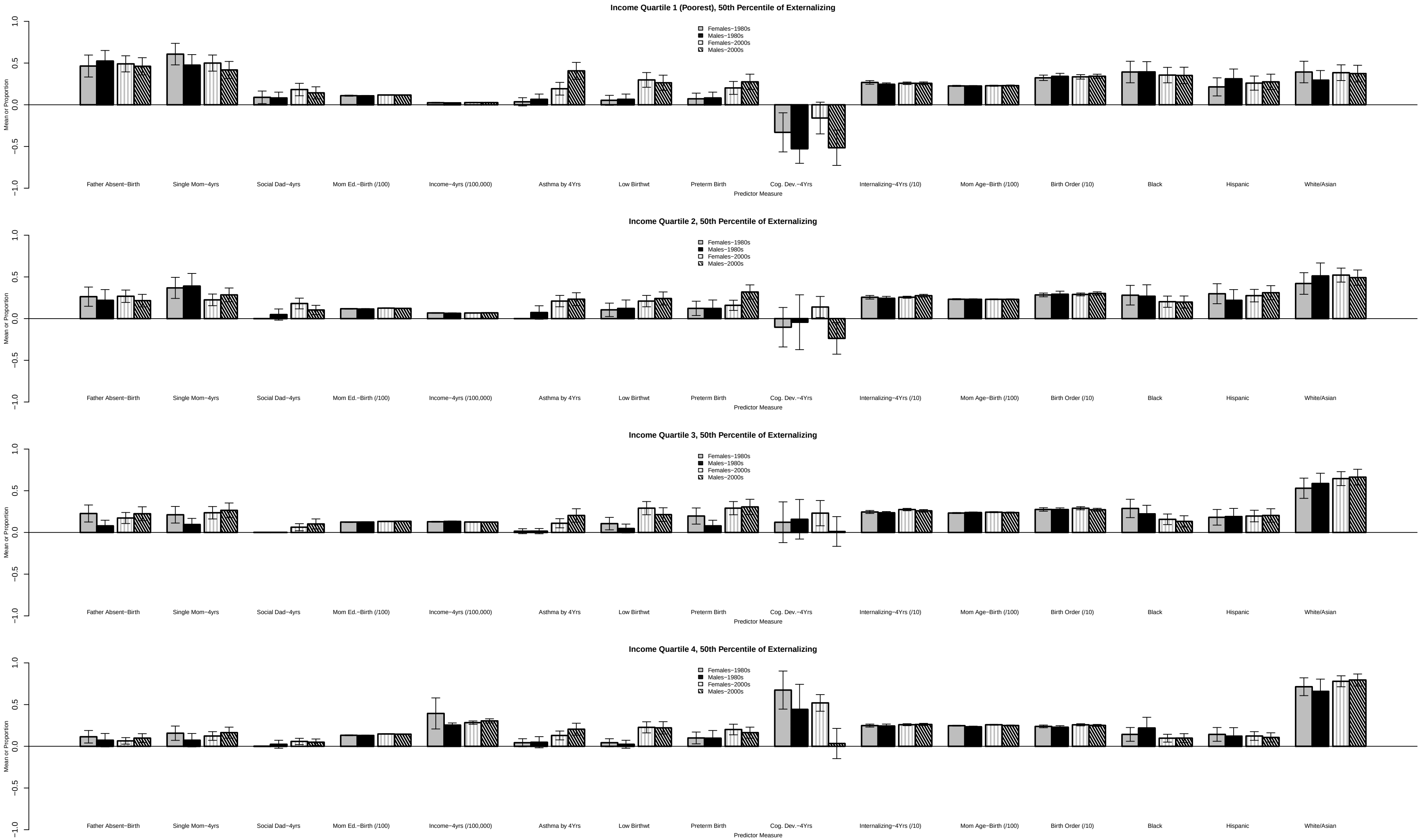


Figure A.5: Means and 95% Confidence Intervals of Predictor Variables, by Per Capita Household Income Quartile, Gender, and Time Period, at Each Sub-Group's Respective 50th Percentile of Externalizing Score



Appendix B

Supplemental Results for Per Capita Household Income Quartile 2

Table B.1: Potential Family and Health Mediators of the Gender Gap in the Location of the 10th Percentile of Externalizing Problems among Per Capita Income Quartile 2 Children Ages 4-5

VARIABLES	(1) NC:	(2) C:	(3) C + SES (I):	(4) C + SES (II):	(5) C +S (I):	(6) C + S (II):	(7) C + H (I):	(8) C + H (II):	(9) C + SES + S (I):	(10) C + SES + S (II):	(11) C + SES + S + H (I):	(12) C + SES + S + H (II):
2001 Birth Cohort	-0.000	0.000	0.000	0.092	0.000	0.000	0.000	0.067	0.000	0.084	0.120	0.085
	(0.000)	(0.156)	(0.159)	(0.131)	(0.140)	(0.154)	(0.136)	(0.123)	(0.143)	(2,186.526)	(0.151)	(0.158)
Male	0.000	0.000	0.000	-0.028	0.000	0.000	0.000	0.133	0.000	0.092	0.080	0.077
	(0.159)	(0.167)	(0.159)	(0.301)	(0.127)	(0.255)	(0.158)	(0.259)	(0.175)	(2,922.206)	(0.173)	(0.267)
2001 Birth Cohort * Male	1.000***	1.000*	1.000*	0.543	1.000*	1.000*	1.000*	0.567	1.000*	0.373	0.586	0.454
	(0.246)	(0.434)	(0.401)	(0.338)	(0.419)	(0.465)	(0.432)	(0.370)	(0.395)	(3,158.897)	(0.361)	(0.324)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth of Child[1]			-0.000	0.024					-0.000	0.028	-0.051	0.025
			(0.045)	(0.366)					(0.044)	(359.636)	(0.046)	(0.065)
Mother's School * Male				-0.108						-0.129		-0.149
				(0.159)						(399.786)		(0.110)
Mother's School * 2001 Cohort				-0.069						-0.058		-0.084
				(0.421)						(364.166)		(0.075)
Mother's School * Male * 2001 Cohort										0.009		0.042
										(390.173)		(0.131)
Family Structure:												
Father Absent at Birth					0.000	0.000			0.000	-0.034	-0.047	-0.094
					(0.088)	(0.225)			(0.101)	(6,822.976)	(0.121)	(0.223)
Single Mother at Age 4					-0.000	0.000			-0.000	0.324	0.082	0.363
					(0.123)	(0.348)			(0.113)	(777.219)	(0.119)	(0.251)
Social Father at Age 4					-0.000	0.000			-0.000	-0.117	-0.027	-0.169
					(0.141)	(1.576)			(0.155)	(10,546.50	(0.170)	(1.741)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						-0.000				0.155		0.214
						(0.402)				(11,307.193)		(0.353)
Single Mother at Age 4 * Male						-0.000				-0.440		-0.465
						(0.475)				(2,458.137)		(0.385)
Social Father at Age 4 * Male						-0.000				-0.028		-0.014
						(1.710)				(15,780.720)		(1.918)
Father Absent at Birth * 2001 Birth Cohort						-0.000				0.096		0.187
						(0.261)				(1.129e+16)		(0.280)
Single Mother at Age 4 * 2001 Birth Cohort						-0.000				-0.347		-0.416
						(0.398)				(1.129e+16)		(0.321)
Social Father at Age 4 * 2001 Birth Cohort						-0.000				0.124		0.082
						(1.567)				(1.129e+16)		(1.761)
Father Absent at Birth * Male * 2001 Birth Cohort						0.000				-0.630		-0.608
						(0.596)				(1.129e+16)		(0.575)
Single Mother at Age 4 * Male * 2001 Birth Cohort						0.000				0.728		0.694
						(0.630)				(1.129e+16)		(0.532)
Social Father at Age 4 * Male * 2001 Birth Cohort						-1.000				-0.053		-0.168
						(1.771)				(1.129e+16)		(1.984)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.000	0.450			0.120	0.279
							(0.177)	(0.422)			(0.162)	(0.382)
Pre-Term Birth (<37 weeks gestation)							-0.000	-0.133			-0.062	-0.145
							(0.087)	(0.228)			(0.110)	(0.224)
Asthma Diagnosis by Age 4 or 5							0.000	0.183			-0.058	-0.015
							(0.096)	(0.569)			(0.127)	(0.422)
Low Birth Weight * Male								0.167				0.333
								(0.382)				(0.307)
Pre-Term Birth * Male								0.067				0.063
								(0.328)				(0.256)
Asthma Diagnosis * Male								-0.617				-0.480
								(0.406)				(0.298)
Low Birth Weight * 2001 Cohort								-0.417				-0.205
								(0.432)				(0.385)
Pre-Term Birth * 2001 Cohort								0.133				0.103
								(0.249)				(0.254)
Asthma Diagnosis * 2001 Cohort								-0.183				0.099
								(0.527)				(0.395)
Controls:												
Black		0.000	0.000	0.007	0.000	0.000	0.000	-0.017	0.000	-0.027	0.018	-0.019
		(0.064)	(0.075)	(1.620)	(0.077)	(0.077)	(0.068)	(0.067)	(0.082)	(383.884)	(0.093)	(0.098)
Hispanic		0.000	0.000	0.120	0.000	0.000	0.000	0.100	0.000	0.153	0.109	0.253+
		(0.157)	(0.145)	(0.299)	(0.166)	(0.165)	(0.165)	(0.150)	(0.150)	(2.705)	(0.149)	(0.142)
Internalizing[1]		-0.000	-0.000	0.196	-0.000	-0.000	-0.000	0.217+	-0.000	0.224	0.183+	0.219**
		(0.131)	(0.117)	(0.146)	(0.132)	(0.129)	(0.127)	(0.116)	(0.120)	(80.035)	(0.104)	(0.075)
Mother's Age at Birth[1]		-0.000	0.000	0.030	-0.000	-0.000	-0.000	0.017	-0.000	0.032	0.031	0.042*
		(0.024)	(0.029)	(0.066)	(0.026)	(0.025)	(0.026)	(0.024)	(0.028)	(5.028)	(0.027)	(0.021)
Birth Order		0.000	0.000	-0.082	0.000	-0.000	0.000	-0.033	0.000	-0.066	-0.085	-0.105+
		(0.060)	(0.074)	(0.077)	(0.064)	(0.060)	(0.061)	(0.058)	(0.073)	(7.499)	(0.071)	(0.060)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.000	0.000	0.061	0.000	0.000	0.000	0.067	0.000	0.026	0.007	0.074
		(0.374)	(0.376)	(0.362)	(0.383)	(0.304)	(0.352)	(0.271)	(0.351)	(121.146)	(0.330)	(0.261)
Child Born 1985		0.000	0.000	0.009	0.000	0.000	0.000	-0.050	0.000	-0.134	0.004	-0.106
		(0.169)	(0.180)	(0.189)	(0.148)	(0.249)	(0.172)	(0.185)	(0.180)	(45.897)	(0.187)	(0.222)
Child Born 1986		0.000	0.000	-0.117	0.000	0.000	0.000	-0.200	0.000	-0.222	-0.078	-0.205
		(0.180)	(0.175)	(2.203)	(0.164)	(0.206)	(0.181)	(0.184)	(0.196)	(131.219)	(0.188)	(0.185)
Constant	6.000	6.000***	6.000***	6.256***	6.000***	6.000***	6.000***	6.156***	6.000***	6.227	6.187***	6.309***
	(0.000)	(0.188)	(0.184)	(0.345)	(0.179)	(0.171)	(0.188)	(0.175)	(0.180)	(2,009.408)	(0.181)	(0.173)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table B.2: Potential Family and Health Mediators of the Gender Gap in the Location of the 25th Percentile of Externalizing Problems among Per Capita Income Quartile 2 Children Ages 4-5

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	NC:	C:	C + SES (I):	C + SES (II):	C +S (I):	C + S (II):	C + H (I):	C + H (II):	C + SES + S (I):	C + SES + S (II):	C + SES + S + H (I):	C + SES + S + H (II):
2001 Birth Cohort	-0.000	0.235	0.267	0.111	0.265	0.585+	0.224	0.176	0.465+	0.484	0.275	0.269
	(0.238)	(0.254)	(0.262)	(0.263)	(0.241)	(0.316)	(0.258)	(0.259)	(0.248)	(0.418)	(0.255)	(0.368)
Male	0.000	0.471+	0.467+	0.299	0.439+	0.683*	0.429+	0.451+	0.528*	0.535	0.424+	0.585+
	(0.238)	(0.266)	(0.238)	(0.240)	(0.238)	(0.289)	(0.226)	(0.230)	(0.227)	(0.355)	(0.244)	(0.341)
2001 Birth Cohort * Male	1.000***	0.000	0.067	0.227	0.000	-0.350	0.081	0.099	-0.035	0.003	0.157	0.091
	(0.272)	(0.401)	(0.292)	(0.276)	(0.336)	(0.375)	(0.309)	(0.287)	(0.291)	(0.445)	(0.276)	(0.390)
Socio-Economic Status (SES):												
Mother's Years of Schooling at Birth of Child[1]			-0.133**	0.042					-0.132***	-0.029	-0.132***	-0.034
			(0.042)	(0.079)					(0.039)	(0.083)	(0.037)	(0.082)
Mother's School * Male				-0.180+						-0.139		-0.115
				(0.107)						(0.120)		(0.114)
Mother's School * 2001 Cohort				-0.150						-0.101		-0.076
				(0.105)						(0.122)		(0.112)
Mother's School * Male * 2001 Cohort				0.119						0.108		0.070
				(0.138)						(0.162)		(0.151)
Family Structure:												
Father Absent at Birth					-0.133	-0.106			-0.069	-0.127	-0.083	-0.180
					(0.154)	(0.278)			(0.196)	(0.281)	(0.152)	(0.298)
Single Mother at Age 4					0.224	0.553+			0.257	0.567	0.236	0.436
					(0.159)	(0.286)			(0.185)	(0.350)	(0.150)	(0.314)
Social Father at Age 4					-0.082	-0.756			-0.021	-0.697	-0.029	-0.690
					(0.163)	(2.031)			(0.177)	(2.211)	(0.161)	(2.130)
Two Biological Parents at Age 4 (=reference)					ref	ref			ref	ref	ref	ref
Father Absent at Birth * Male						0.008				0.322		0.335
						(0.515)				(0.574)		(0.546)
Single Mother at Age 4 * Male						-0.593				-0.557		-0.697
						(0.456)				(0.499)		(0.463)
Social Father at Age 4 * Male						0.797				0.776		0.721
						(2.230)				(2.459)		(2.313)
Father Absent at Birth * 2001 Birth Cohort						0.252				0.250		0.279
						(0.369)				(0.352)		(0.362)
Single Mother at Age 4 * 2001 Birth Cohort						-0.634+				-0.543		-0.421
						(0.378)				(0.419)		(0.410)
Social Father at Age 4 * 2001 Birth Cohort						0.577				0.611		0.633
						(2.062)				(2.234)		(2.142)
Father Absent at Birth * Male * 2001 Birth Cohort						-0.642				-0.979		-1.013
						(0.666)				(0.697)		(0.677)
Single Mother at Age 4 * Male * 2001 Birth Cohort						1.358*				1.074		1.232*
						(0.599)				(0.667)		(0.601)
Social Father at Age 4 * Male * 2001 Birth Cohort						-0.496				-0.656		-0.631
						(2.257)				(2.489)		(2.318)
Early Childhood Health:												
Low Birth Weight (<5.5 pounds, 2,500 g)							0.371+	0.346			0.264	0.217
							(0.199)	(0.412)			(0.184)	(0.428)
Pre-Term Birth (<37 weeks gestation)							-0.171	-0.231			-0.105	-0.240
							(0.161)	(0.342)			(0.165)	(0.338)
Asthma Diagnosis by Age 4 or 5							0.019	-0.626			0.079	-0.862
							(0.193)	(0.587)			(0.190)	(0.681)
Low Birth Weight * Male								0.148				0.108
								(0.411)				(0.365)
Pre-Term Birth * Male								-0.005				-0.100
								(0.347)				(0.308)
Asthma Diagnosis * Male								-0.357				-0.192
								(0.356)				(0.369)
Low Birth Weight * 2001 Cohort								0.082				0.163
								(0.348)				(0.364)
Pre-Term Birth * 2001 Cohort								0.863				0.999
								(0.577)				(0.644)
Asthma Diagnosis * 2001 Cohort								-0.038				0.040
								(0.427)				(0.449)
Controls:												
Black		0.235	0.200	0.215	0.214	0.195	0.248	0.176	0.167	0.182	0.155	0.209
		(0.189)	(0.177)	(0.178)	(0.189)	(0.185)	(0.170)	(0.172)	(0.174)	(0.178)	(0.171)	(0.178)
Hispanic		0.353+	0.200	0.245*	0.327*	0.293+	0.367*	0.363*	0.222+	0.216	0.320*	0.282+
		(0.184)	(0.125)	(0.114)	(0.162)	(0.166)	(0.149)	(0.160)	(0.134)	(0.137)	(0.138)	(0.154)
Internalizing[1]		0.353*	0.400***	0.387***	0.378**	0.374***	0.357**	0.368***	0.410***	0.384***	0.347***	0.345***
		(0.158)	(0.090)	(0.083)	(0.119)	(0.104)	(0.115)	(0.106)	(0.089)	(0.081)	(0.072)	(0.076)
Mother's Age at Birth[1]		0.059*	0.067**	0.066**	0.051+	0.041	0.052*	0.044+	0.062**	0.055*	0.072**	0.053*
		(0.030)	(0.023)	(0.022)	(0.027)	(0.027)	(0.025)	(0.026)	(0.023)	(0.025)	(0.023)	(0.026)
Birth Order		-0.118	-0.133*	-0.142*	-0.112	-0.106	-0.086	-0.060	-0.125+	-0.134+	-0.112+	-0.098
		(0.080)	(0.062)	(0.062)	(0.073)	(0.075)	(0.071)	(0.075)	(0.064)	(0.077)	(0.064)	(0.067)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		-0.059	-0.067	-0.079	-0.051	-0.033	-0.038	0.044	0.028	-0.068	0.020	0.072
		(0.264)	(0.283)	(0.267)	(0.260)	(0.232)	(0.253)	(0.239)	(0.281)	(0.269)	(0.296)	(0.260)
Child Born 1985		-0.471	-0.467	-0.447	-0.388	-0.350	-0.300	-0.214	-0.257	-0.346	-0.281	-0.209
		(0.306)	(0.299)	(0.299)	(0.299)	(0.287)	(0.301)	(0.292)	(0.283)	(0.312)	(0.303)	(0.305)
Child Born 1986		-0.529	-0.333	-0.626	-0.531	-0.228	-0.486	-0.489	-0.208	-0.233	-0.285	-0.297
		(0.405)	(0.366)	(0.414)	(0.381)	(0.379)	(0.363)	(0.357)	(0.349)	(0.449)	(0.360)	(0.413)
Constant	7.000***	7.043***	7.029***	7.200***	7.013***	6.742***	6.933***	6.887***	6.789***	6.806***	6.839***	6.798***
	(0.238)	(0.287)	(0.272)	(0.270)	(0.267)	(0.323)	(0.278)	(0.272)	(0.250)	(0.363)	(0.250)	(0.360)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.

Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.

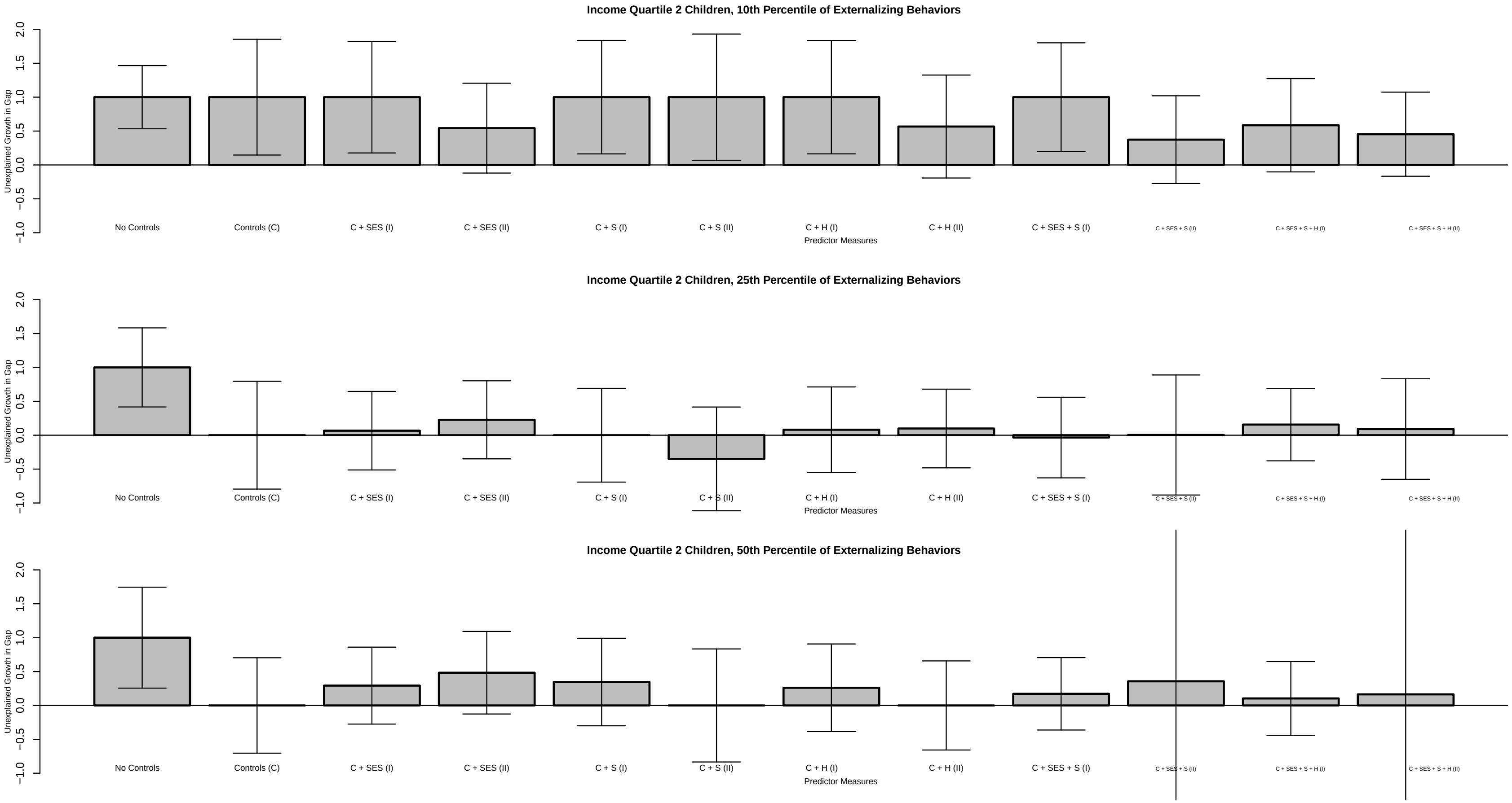
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Table B.3: Potential Family and Health Mediators of the Gender Gap in the Location of the 50th Percentile of Externalizing Problems among Per Capita Income Quartile 2 Children Ages 4-5

VARIABLES	(1) NC:	(2) C:	(3) C + SES (I):	(4) C + SES (II):	(5) C +S (I):	(6) C + S (II):	(7) C + H (I):	(8) C + H (II):	(9) C + SES + S (I):	(10) C + SES + S (II):	(11) C + SES + S + H (I):	(12) C + SES + S + H (II):
2001 Birth Cohort	0.000	0.500	0.439+	0.373	0.424	0.500	0.304	0.500+	0.580*	0.407	0.601*	0.423
	(0.045)	(0.318)	(0.240)	(0.272)	(0.273)	(0.326)	(0.284)	(0.291)	(0.263)	(0.330)	(0.257)	(4.786)
Male	0.000	0.500+	0.463*	0.237	0.394	0.500	0.435	0.500+	0.538*	0.257	0.592*	0.353
	(0.378)	(0.297)	(0.232)	(0.269)	(0.264)	(0.323)	(0.265)	(0.287)	(0.248)	(0.341)	(0.254)	(0.868)
2001 Birth Cohort * Male	1.000**	-0.000	0.293	0.483	0.345	-0.000	0.261	-0.000	0.172	0.356	0.103	0.163
	(0.378)	(0.375)	(0.270)	(0.303)	(0.313)	(0.412)	(0.319)	(0.338)	(0.303)	(0.389)	(0.303)	(1.477)
Socio-Economic Status (SES):												
Mother's Years of Schooling at			-0.122**	-0.011					-0.134**	-0.025	-0.139**	-0.024
Birth of Child[1]			(0.045)	(0.100)					(0.046)	(0.108)	(0.043)	(1.162)
Mother's School * Male				-0.242						-0.244		-0.237
				(0.149)						(0.155)		(0.714)
Mother's School * 2001 Cohort				-0.032						-0.013		-0.062
				(0.106)						(0.110)		(1.343)
Mother's School * Male * 2001				0.072						0.055		0.073
Cohort				(0.173)						(0.172)		(0.839)
Family Structure:												
Father Absent at Birth					-0.121	0.500			-0.118	0.283	-0.066	0.300
					(0.198)	(0.485)			(0.258)	(0.438)	(0.218)	(5.987e+13)
Single Mother at Age 4					0.158	-0.000			0.221	-0.038	0.156	0.108
					(0.184)	(0.419)			(0.181)	(0.407)	(0.183)	(5.987e+13)
Social Father at Age 4					-0.079	1.000			-0.073	1.264	-0.209	1.158
					(0.287)	(2.564)			(0.264)	(2.591)	(0.251)	(21.527)
Two Biological Parents at Age 4					ref	ref			ref	ref	ref	ref
(=reference)												
Father Absent at Birth * Male						-0.500				0.160		0.096
						(0.691)				(0.690)		(5.987e+13)
Single Mother at Age 4 * Male						0.000				-0.137		-0.390
						(0.578)				(0.598)		(5.987e+13)
Social Father at Age 4 * Male						0.500				-0.085		-0.684
						(2.922)				(3.001)		(60.259)
Father Absent at Birth * 2001 Birth						-0.500				-0.264		-0.267
Cohort						(0.560)				(0.536)		(5.987e+13)
Single Mother at Age 4 * 2001						-0.000				0.075		-0.052
Birth Cohort						(0.518)				(0.509)		(5.987e+13)
Social Father at Age 4 * 2001 Birth						-1.500				-1.774		-1.628
Cohort						(2.587)				(2.627)		(20.569)
Father Absent at Birth * Male *						0.500				-0.443		-0.431
2001 Birth Cohort						(0.850)				(0.889)		(5.987e+13)
Single Mother at Age 4 * Male *						0.500				0.439		0.751
2001 Birth Cohort						(0.764)				(0.790)		(5.987e+13)
Social Father at Age 4 * Male *						-0.000				0.708		1.340
2001 Birth Cohort						(2.980)				(3.028)		(59.344)
Early Childhood Health:												
Low Birth Weight							0.304	-0.000			0.303	-0.064
(<5.5 pounds, 2,500 g)							(0.234)	(0.517)			(0.202)	(5.153)
Pre-Term Birth (<37 weeks							-0.130	0.000			-0.090	-0.408
gestation)							(0.207)	(0.435)			(0.173)	(0.444)
Asthma Diagnosis by Age 4 or 5							-0.000	-1.000			0.012	-0.971
							(0.141)	(0.827)			(0.140)	(9.111)
Low Birth Weight * Male								0.500				-0.196
								(0.444)				(1.074)
Pre-Term Birth * Male								-0.500				0.125
								(0.375)				(0.608)
Asthma Diagnosis * Male								0.500				0.062
								(0.366)				(0.365)
Low Birth Weight * 2001 Cohort								0.000				0.506
								(0.545)				(5.450)
Pre-Term Birth * 2001 Cohort								-0.000				0.297
								(0.457)				(0.556)
Asthma Diagnosis * 2001 Cohort								1.000				0.941
								(0.814)				(9.858)
Controls:												
Black		-0.000	0.195	0.085	0.206	-0.000	0.174	0.000	0.187	0.094	0.161	0.172
		(0.199)	(0.153)	(0.149)	(0.199)	(0.198)	(0.194)	(0.202)	(0.175)	(0.193)	(0.181)	(1.474)
Hispanic		0.000	0.073	0.043	0.194	0.000	0.174	0.000	0.099	0.019	0.095	0.057
		(0.181)	(0.124)	(0.125)	(0.173)	(0.182)	(0.166)	(0.175)	(0.153)	(0.154)	(0.155)	(0.872)
Internalizing[1]		0.500***	0.439***	0.436***	0.467***	0.500***	0.478***	0.500***	0.443***	0.472***	0.453***	0.484
		(0.087)	(0.076)	(0.080)	(0.081)	(0.075)	(0.075)	(0.070)	(0.073)	(0.082)	(0.077)	(0.613)
Mother's Age at Birth[1]		-0.000	0.024	0.021	0.006	-0.000	0.000	0.000	0.023	0.019	0.026	0.029
		(0.015)	(0.022)	(0.026)	(0.017)	(0.018)	(0.020)	(0.019)	(0.026)	(0.027)	(0.024)	(0.077)
Birth Order		-0.000	0.000	-0.000	0.055	0.000	0.043	-0.000	0.004	0.019	-0.008	-0.014
		(0.046)	(0.058)	(0.052)	(0.055)	(0.055)	(0.047)	(0.049)	(0.064)	(0.059)	(0.070)	(0.273)
Child Born 1983		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Child Born 1984		0.000	-0.171	-0.250	0.097	0.000	-0.087	0.000	-0.137	-0.363	-0.157	-0.057
		(0.329)	(0.323)	(0.325)	(0.332)	(0.337)	(0.341)	(0.355)	(0.355)	(0.351)	(0.325)	(2.397)
Child Born 1985		0.000	-0.049	-0.074	-0.018	0.000	-0.000	0.000	-0.015	-0.132	-0.045	-0.050
		(0.349)	(0.312)	(0.325)	(0.338)	(0.380)	(0.348)	(0.349)	(0.333)	(0.341)	(0.355)	(1.381)
Child Born 1986		0.000	0.000	-0.043	0.061	0.000	-0.043	0.000	-0.122	-0.038	-0.069	0.039
		(0.298)	(0.278)	(0.268)	(0.292)	(0.336)	(0.290)	(0.343)	(0.283)	(0.325)	(0.302)	(3.117)
Constant	8.000***	7.831***	7.742***	7.883***	7.653***	7.831***	7.795***	7.831***	7.594***	7.838***	7.593***	7.834
	(0.045)	(0.312)	(0.255)	(0.271)	(0.293)	(0.325)	(0.274)	(0.307)	(0.269)	(0.364)	(0.266)	(4.940)
Observations	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650

[1]Specified variables (including within interactions) are centered at their overall sample mean.
Sample sizes are rounded to the nearest 50 in compliance with the terms of the ECLS-B restricted-use data license.
Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.10. Model estimates are based on multiple imputation of 20 datasets. NC = No Controls, C = Controls, SES = Family Socioeconomic and Cultural Resources, S = Family Structure, H = Early Childhood Health. Model (I) refers to main effects models, Model (II) refers to models with interactions by gender, time period, and gender * time period.

Figure B.1: Potential Family and Health Mediators of the Growth of the Gender Gap in the Location of the 10th, 25th, and 50th Percentiles of Externalizing Behavior Problems at Ages 4-5 among Income Quartile 2 Children



Notes: See the Appendix for the full table of results. Model labels refer to: Controls (C): Internalizing problems (centered), mother's age at birth (centered), birth order, dummies for year of birth (1984-1986) and race/ethnicity; SES (I): mother's years of schooling at birth (centered); SES (II): mother's years of schooling interacted with each of the following: male, time period (2001 cohort indicator variable), and male*time period; Family Structure (S) (I): father absent at birth dummy and dummies for single mother at age 4 or social father at age 4 (two biological parents at age 4 is the reference); S (II): interactions between each of the S (I) variables and male, time period, and male*time period; Early Childhood Health (H) (I): a dummy for low birth weight, a dummy for pre-term, and a dummy for asthma diagnosis by age 4 or 5; H (II): interactions between each H (I) variable and male, time period, and male*time period.

Appendix C

Results by Mother's Education Level

Figure C.1 shows that the shifts in the externalizing problems distributions of females and males in the early and late time periods within the four categories of mother's education exhibit remarkably similar patterns to the shifts in the externalizing problems distributions within each of the four corresponding household income categories. At one extreme, children whose mothers had not completed high school exhibited similar shifts in externalizing problems by gender and time period as children in the lowest household income quartile. At the other extreme, children whose mothers had a college degree experienced similar shifts in externalizing problems by gender and time period as did children in the highest income quartile.

[FIGURE C.1 ABOUT HERE]

Figure C.2 displays the same expected values of externalizing problems as Figure 5 except broken down by mother's education level, time period and gender. The patterns of externalizing problems scores and gender gaps across categories of mother's education are very similar to those by household income quartile. Expected values of externalizing problems at virtually all observed quantiles are highest among the children whose mothers who do not have a high school degree and decrease gradually with mother's education. In the later period, gender gaps in expected values of externalizing problems are present even at the 10th and 25th quantiles among the children of mothers with no high school degree or a high school degree/GED; these gaps are not present in the later period at the 10th and 25th quantiles among children with more highly educated mothers.

[FIGURE C.2 ABOUT HERE]

Panel 1 of Figure C.3 shows that, in the 1980s, there was a 1- or 2-point gender gap in in the location of the 90th and 75th percentiles of externalizing problems across children from all four mother's education groups. The gender gap in the location of the 50th percentile showed up among children whose mothers had less than a high school degree or who had some college, but not among children whose mothers had a high school or a college degree. The gap in the location of the 50th percentile among children of mothers with some college occurred because these mothers rated their girls as having very low levels of externalizing problems – levels on par with girls at the 50th percentile from the most-educated mothers – but rated their sons as having higher levels of externalizing problems than did the most-educated mothers of boys at the 50th percentile. The gender gap in the location of the 25th percentile appeared among children whose mother's had some college. This gap in the location of the 25th percentile occurred for the same reason as the gaps in location of the 50th percentiles – because these mother's rated their daughters as having the lowest possible levels of externalizing problems.

[FIGURE C.3 ABOUT HERE]

Panel 2 of Figure C.3 shows that, with one exception, the growth in the gender gap between the 1980s and 2000s appeared only among the children whose mothers had no more than a high school degree. Even more strikingly, this growth in the gap occurred at virtually every observed externalizing problems percentile, except for children of mothers with less than a high school degree at the 50th percentile. The result was the emergence of a gender gap even in the location of the 10th and 25th percentiles among children in the two lowest education brackets. By contrast, the children of mothers in the two highest education brackets did not exhibit a gender gap in the location of the 10th, 25th, or 50th percentiles (the growth in the gap in the location of the 50th percentile for children from the highest education bracket is based on a noisy estimate that is not statistically distinguishable from zero).

Figure C.1: Externalizing Problems Distribution, by Mother's Education, Gender, and Cohort

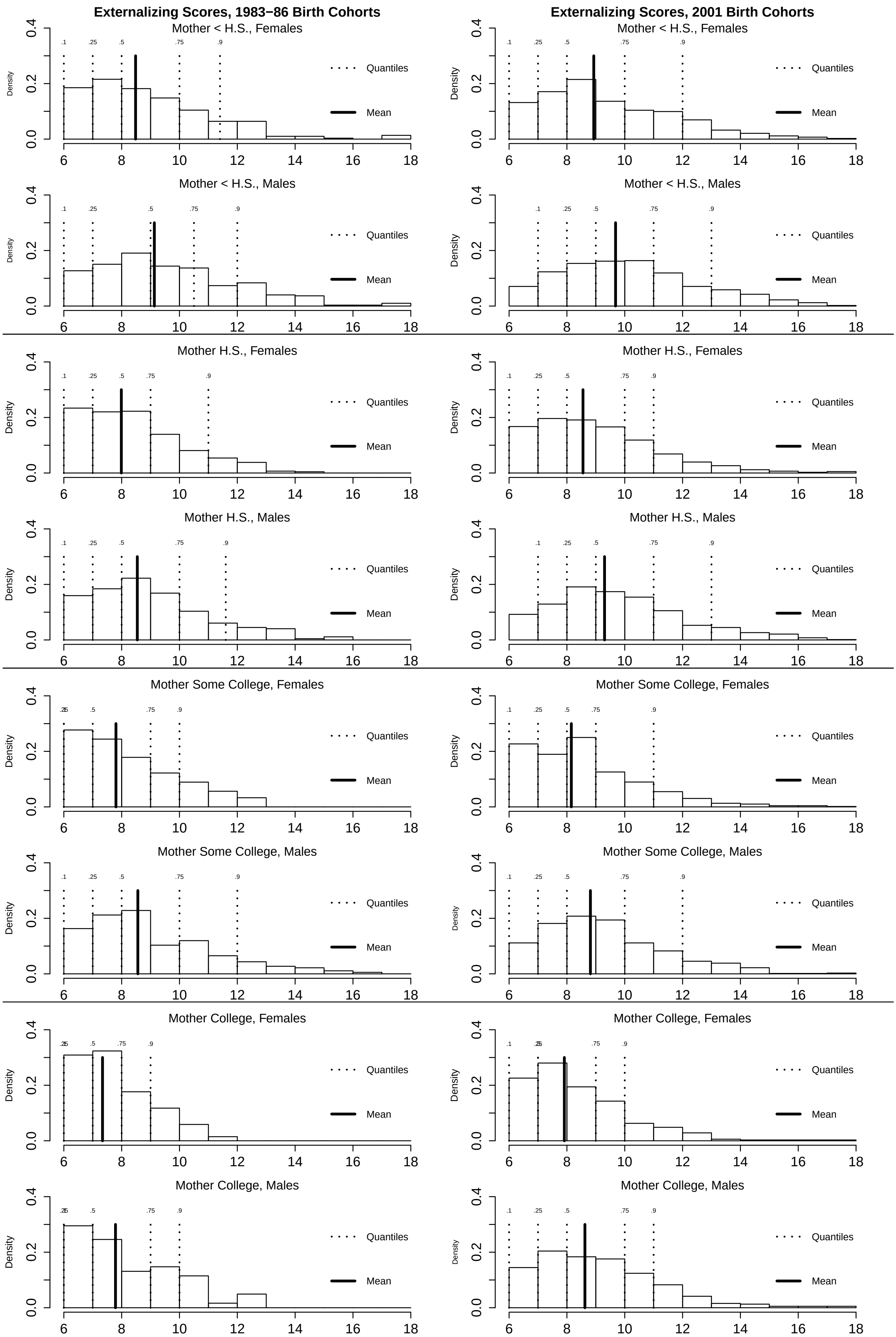


Figure C.2: Expected Values of Externalizing Problems at Ages 4 and 5 at Various Points in the Behavioral Distribution, by Mother's Education Level, Cohort, and Gender

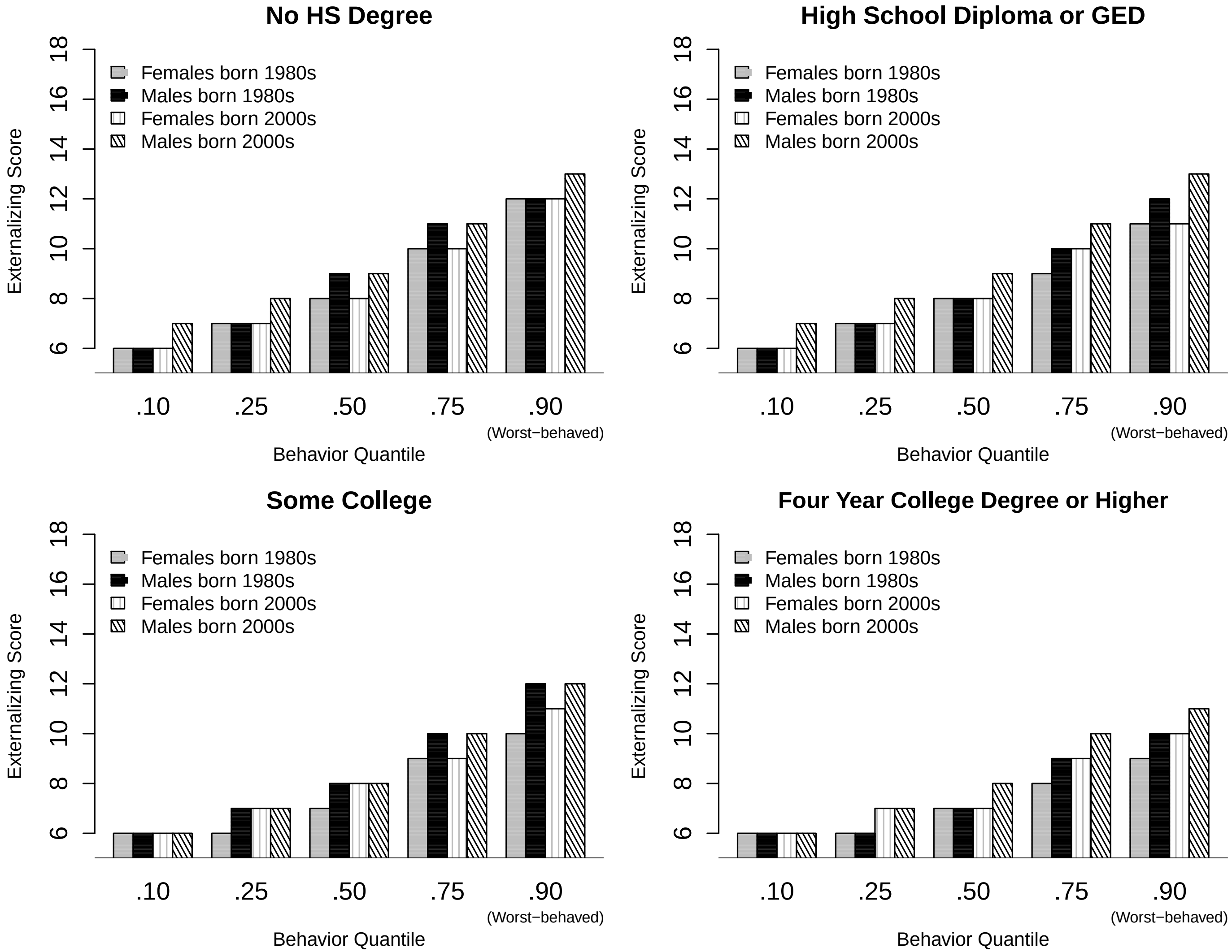


Figure C.3: Gender Gap in the location of the 10th, 25th, 50th, 75th, and 90th Percentiles of Externalizing Problems Within Girls' and Boys' Respective Behavioral Distributions and Change in Gender Gaps Between the 1980s and 2001 Cohorts, by Mother's Education Level