EARLY CHILDHOOD BEHAVIORAL SKILLS AND THE GENDER REVERSAL IN EDUCATIONAL ATTAINMENT: A NEW PERSPECTIVE

The gender reversal in high school completion, college enrollment, and college completion represents one of the most salient demographic shifts in the United States in recent decades. Many scholars and policy-makers overlook this trend, instead focusing on areas in which women are disadvantaged. But, following Buchmann and DiPrete (2006), I argue that, in order to fully understand dynamics of gender inequality, we must understand why and how women gain a leg-up in their few realms of advantage. The gender reversal in educational attainment must also be better understood because it carries dramatic implications for possible changes to come in the gender breakdown in the labor market, the gender gap in wages, the vitality of marriage markets, and dynamics within the family (Buchmann and DiPrete 2006). Given these consequences, understanding the *sources* of this reversal is critical.

Previous explanations for this reversal emphasize increasing returns to women's education in the labor market, and the norm of dual-income families. I argue that these explanations are incomplete. This study proposes and tests a new theory for the gender reversal in educational attainment. In this complementary explanation, I posit that girls' longstanding advantage in early childhood behavioral development, including attention, concentration, and social skills, has grown as American family structures, parenting practices, and economic resources have shifted, leading to men's decreased relative educational success. This explanation has been largely untested due to a prior lack of longitudinal data spanning children's early childhood and educational careers. However, the consequences of such a finding would have wide-ranging implications for parental

education programs, family and parenting practices, early childhood education policies, and our understanding of intergenerational inequality.

The argument and empirical findings I lay out here rely on one fundamental assumption: that because the gender gap in behavioral skills has grown over the past 15 years, the larger gap evidenced among children born in 2001 will explain an even larger share of the gender reversal in educational attainment (assuming current trends persist) among the 2001 cohort than that which we observe in the 1983-1986 cohorts. This assumption is necessitated by the fact that we are clearly unable to speed ahead time in order to gather real educational attainment data on 2001-born children in their mid-20s—at comparable ages to those children born between 1983 and 1986 for whom we have observed educational attainment.

The Gender Reversal in Educational Attainment

In recent decades, females have surpassed males in their rates of high school completion, college enrollment, and college completion (Buchmann and DiPrete 2006). Whereas boys used to complete high school on-time (without truancy or grade retention) at higher rates and earn higher scores than girls on nation-wide exams like the National Assessment of Educational Progress (NAEP), today, girls are less likely to be held back a grade or expelled (Greene and Winters 2006; Mead 2006).[1] In 2004, 11.6 percent of males and 9 of females 16-24 dropped out of high school (U.S. Department of Education 2005).

[1] Notably, however, girls have long out-performed boys in the realm of *grade performance* in a variety of fields—with a main exception being that of math performance. This fact is not contrary to the argument presented here. This long-standing female advantage in grade performance has itself grown over time, largely as a result of increased rates of male drop-out, grade retention, and expulsion.

Similar trends exist in higher education. Whereas males used to enroll in four-year colleges and earn their bachelor's degree on-time at higher rates than females all the while representing a greater share of total enrollment at selective universities compared to females, since the 1970s, females have been out-performing males on each measure (Buchmann, DiPrete, McDaniel 2008; Buchmann and DiPrete 2006). For example, despite the fact that the proportion of both men and women enrolling in college has increased since the 1970s, the increase for women has been much more substantial (National Center for Education Statistics 2006). In 1996, women surpassed men in direct college enrollment rates. The female advantage in college enrollment exists for all racial groups. Females are also advantaged in their rate of college enrollment immediately after high school (in tandem with high rates of male delay). Direct college enrollment following high school completion is critical because students who enroll in college immediately after high school are more likely to stay in college, and–ultimately–to graduate from college. In 2000, 66 percent of women and 60 percent of men enrolled in college right after high school (Freeman 2004). By race, women earn 67% of all bachelor's degrees awarded to blacks; the figures are 61% for Hispanics, 61% for Native Americans, 54% for Asians, and 57% for whites (National Center for Education Statistics 2006). The female-favoring higher education trends are particularly pronounced when comparing black and Hispanic males and females. This raises important questions not only about overall losses in human capital development and future U.S. labor market productivity as the demographics of the U.S. population shift in favor of racial minority groups, but also about a new type of racially-embedded gender stratification.

Most explanations for this reversal have focused on women's increasing incentives for college via greater returns in the labor market, as well as with the normalization of dual income earner families (Brooks and Bolzendahl 2004; Goldin 2006; Oppenheimer 1994). This emphasis on the economic correlates of the gender gap in high school graduation, college enrollment, and college graduation focuses on social-structural factors in adulthood as likely causes. These studies frame the gender gap as a result of *females'* growing advantages in educational attainment relative to males (Buchmann and DiPrete 2006; Buchmann, DiPrete and McDaniel 2008). No research to my knowledge examines the potential early childhood origins of the reversal via boys' and girls' uneven behavioral development at the individual level.

Early Childhood Behavioral Skills

Behavioral skills are indicators of children's underlying attention, concentration, and social abilities. Behavioral skills include the ability to self-regulate (Shonk and Cicchetti 2001; Shelton et al. 1998), concentrate while sitting in place for extended periods (Duncan et al. 2007), cooperate/comply with teacher instructions (Roberts 1999; Wentzel and Asher 1995), learn passively through verbal or written as opposed to experiential processes, and get along with other children (Alexander, Entwisle, and Horsey 1997). Many psychologists group these concentration, attention, and social skills into a general scale of *externalizing behaviors* (Campbell, Shaw, and Gilliom 2000; Rothbaum and Weisz 1994).

Externalization involves being antisocial, headstrong, uncooperative/non-compliant, or impulsive (Magnuson, Duncan, and Kalil 2003). Externalizing behaviors can be sub-categorized into those skills that are considered *social* in nature, and those

considered *self-regulatory*. Logically, the same social and self-regulatory skills used to measure behavioral development in early childhood are among the same skills used to determine school readiness. Broadly, school readiness entails possessing the social/behavioral and academic skills necessary to learn productively in a structured, classroom environment—often based on absorbing material through lectures or discussion as opposed to experientially.[2] On the social side, these skills include the ability to abstain from tantrums and get along with other children (Raver 2002). Sharing and getting along with others are also central for working in groups, functioning around teachers, making friends and fitting in socially (Raver 2002). On the self-regulation side, attention and concentration are necessary for planning and implementing goal-directed activity (Bell 1998; Blair 2002). Attention and concentration in particular approximate psychobiologists' notion of inhibitory/effortful control, which is connected to the development of the ventromedial prefrontal cortex and its ability to receive and transmit signals from the amygdala that inhibit moral and other transgressions (Blair 2007; Finger et al. 2007).

Behavioral skills are important not only for school readiness—which is well-documented. Rather, the types of behaviors children possess early on in life may serve as a persistent signal of their proclivities toward concentration, attention, and social interaction, which may shape persistence in later schooling. For example, research has begun to infer—though not explicitly test—that low levels of prefrontal cortex development in early childhood may be linked to delinquency—such as criminal activity

[2] Behavioral development is not the only component of school readiness. The Metropolitan Readiness Test (MRT), which is often used as a measure of kindergarten readiness, tests a variety of other developmental abilities, including auditory skills, like the ability to identify sound-letter correspondences, visual skills including the ability to identify patterns and match across similarities in appearance, language and listening skills, and quantitative/mathematical reasoning and operations skills (Gullo and Burton 1992).

and high school drop- out—many years later (Loeber & Hay 1997; Shonkoff and Phillips 2000).

Research has made more concrete steps toward documenting the persistence of early childhood behavioral development as children age. Some studies document that the same behavioral skills that serve as indicators of school readiness are in fact also predictive of intermediate (i.e. elementary and middle school) achievement outcomes in the form of standardized test scores in reading and math (Alexander et al. 2003; Cawley, Heckman, and Vytlacil 2001; DiPrete and Jennings 2009; Heckman and Masterov 2007; Heckman and Rubenstein 2001; Jennings and DiPrete 2010; Ladd, Birch, and Buhs 1999; Normandeau and Guay 1998; Trzesniewski et al. 2006). This is because early self-regulation is in particular also critical for cognitive development (Bell 1998; Farkas 2003).

The Gender Gap in Early Childhood Behavioral Skills

The developmental psychology literature focusing on early childhood self-regulation and the school readiness literature are rarely integrated into sociological studies of educational attainment. Psychological development in early childhood, however, is critical because gender-divided behavior patterns lead to persistent underlying differences in children's development of the behavioral skills required for school entry, progress, and cognitive development (Raver and Knitzer 2003). Research has quite consistently found that girls display higher levels of self-regulation and social skills (and therefore lower levels of aggression and externalizing behaviors overall) than boys in early and middle childhood (Coie and Dodge 1997). For example, whereas boys exhibit higher levels of externalizing behavior, on average, girls tend to have higher levels of another negatively-

sanctioned behavior known as *internalizing* (Matthews et al. 2009; Pasterski et al. 2007). Internalization involves behavior such as frequent crying or being fearful, anxious, or withdrawn.

More specifically, research supports the existence of female-favoring disparities in positive behavioral skills as early as kindergarten (DiPrete and Jennings 2009). Research documents the importance of girls' advantages as early as kindergarten for helping predict a large fraction of their advances in standardized test performance in elementary school (DiPrete and Jennings 2009; Jennings and DiPrete 2010). The types of behavioral skills girls develop early on are negatively associated with deviant school and classroom behaviors, like trouble-making in class, tardiness, and absenteeism (Alexander, Entwisle, and Dauber 2003; Entwisle, Alexander, and Olson 2007). As early as the Perry Preschool Program intervention in the 1960s, some research has suggested preschools that center on child-teacher hands-on learning lead to significant increases in years of schooling, earnings, and other outcomes (Heckman, Moon, Pinto, Savelyev 2009, 2010). Researchers often assert that the Perry Preschool curriculum was successful because it catered to the active learning styles of many children, particularly boys, when they are between 3 and 5 years (Cawley, Heckman and Vytlacil 2001; Heckman and Masterov 2007; Heckman and Rubenstein 2001). Female advantages in the development of the behavioral skills that help comprise school readiness may play a key role in predicting later achievement and attainment, though the latter has not been explicitly examined (Blair 2002; Duncan et al. 2007; Raver 2002; Raver and Knitzer 2002).

Some scholars pose that cognitive—rather than behavioral—differences by gender in early childhood are the real culprit. However, recent studies find limited support for the

competing hypothesis of gender differences in early childhood cognitive skills measured through standardized tests beginning in kindergarten and continuing into early elementary school (Buchmann and DiPrete 2006; DiPrete and Jennings 2009; Gibbs 2010). It is increasingly clear that cognitive skills differences do not do a good job in explaining girls' educational advantages (Shonkoff and Phillips 2000). In fact, previous research shows behavioral skills are equally if not more important than cognitive skills in predicting later educational achievement based on teacher assessments and, at the older ages, grades (Lin, Lawrence, and Gorrell 2003; Schafer and McDermott 1999; National Center for Education Statistics 1993). It is likely, though, that there are strong interdependencies between behavioral and cognitive skills—though these are under-examined. A combination of test scores (which often aim to measure cognitive skills) and behavioral factors, such as study skills/work habits, disruptiveness and tardiness or absenteeism in class, explain virtually 100 percent of *differences* in grade performance by gender and race/ethnicity in adolescence (Farkas et al. 1990; Rosenbaum 2001).

> *Hypothesis 1: The growth in the gender gap in behavioral skills explains a significant proportion of the gender reversal in high school/GED completion, college enrollment, and 2- as well as 4-year college completion.*

Changes in American Families and Children's Behavioral Problems

Recent work by developmental psychologists argues that the foundations of the behavioral skills later used to determine school readiness are laid during infancy. As such, early behavioral development takes place in families, with parents acting as the first interlocutors of children's behavioral development (Blair 2002). During their first years of life, parent-child attachment type, and parental—particularly maternal—emotion expressivity, warmth, supervision, and attitudes toward learning help shape a child's

cognitive, emotional, social, and behavioral development (Eisenberg, Fabes, Guthrie, and Reiser 2000; Fantuzzo and McWayne 2002; Goodman, Barfoot, Frye, and Belli 1999; Laible 2004; Raver 1996). In terms of behavioral development, parent-child associations have been found to particularly influence child cooperation, compliance, interest and attentiveness, concentration, and self-control (Blair 2002).

Over the same period that the gender reversal in attainment has emerged, rates of out-of-wedlock childbearing and divorce/separation have skyrocketed, leveling off around 33% and 54%, respectively in 2000 (Sigle-Rushton and McLanahan 2004). Cohabitation and parents' numbers of partner transitions have also increased (McLanahan and Percheski 2008). Given the strong association between education and earnings (Card 1999), lower educational attainment decreases males and females' incentives for stable union formation (Anderson 2000; McLanahan and Percheski 2008; Sampson 1993). The result is increases in non-marital childbearing and non-traditional family structures (i.e. single parent or non-biological, cohabiting partner households) and higher rates of family instability (changes from two- to one-parent households or vice versa, often with changes in romantic partners) (McLanahan and Percheski 2008). With these increases often come the absence of the biological father and the presence of a social father.

> *Hypothesis 2: With the rise in biological father absence, more children today than even fifteen to twenty years ago are born to unmarried parents and raised with social fathers.*

Research documents that family economic resources, family structure—particularly biological father absence and social father presence, parental conflict, and parenting are associated with increases in children's behavioral problems in early childhood (see Loeber and Hay 1997 for a review). However, prior research is inconclusive about whether family

factors matter differently for boys than girls. Some research argues boys are hurt more by non-traditional family structures including the presence of social fathers, lack of economic resources, harsh parenting and insecure parental attachments, and associated factors (Allison and Furstenberg 1989; Harris and Morgan 1991; Hetherington and Arasteh 1988; Lundeberg and Rose 2002; Rossi and Rossi 1990; Wildeman 2011). Other research finds few differences for boys compared to girls.

In addition to the possible mediating role of family factors in the relationship between child gender and behavioral development, I consider early childhood health. I include early childhood health along with the explicitly family-related variables because I conceptualize early gender differences in health as a partial outgrowth of family processes, and ones which may be linked to gender differences in behavioral development. For example, it is well-documented that boys experience higher rates of asthma in early childhood (Bjornson and Mitchell 2000). Research also shows that family factors are associated with asthmatic children's social in addition to cognitive development. Among asthmatic children and children dealing with other chronic diseases, negative coping behaviors, low levels of psycho-social well-being, and poor self-concept are linked to strained family relationships, such as those that might be associated with nontraditional family structures, harsh or unsupportive parenting, or low economic resources (though the direction of causality is unclear) (Barlow and Ellard 2006; McNelis et al. 2000). As such, early childhood health may bear important associations with children's behavioral development and be associated with a broader constellation of family processes.

> *Hypothesis 3: Early childhood asthma and ear infection diagnoses are associated with higher levels of externalizing, and lower levels of self-regulation and social skills at ages 4 and 5.*

This paper tests two primary ways in which family mechanisms and child health may affect boys and girls differently: First, parents may respond differently to boys than girls (e.g., differential exposure to various family structures, economic resources, parenting, and health outcomes). Some research shows that adults respond differently to a child based on the child's gender (Condry & Condry 1976; Hyde 2007; Stern & Karaker 1989). Second, boys and girls may respond differently to the same exposure. As mentioned earlier, much of the neuroscience, biology, psychology, and criminology literature highlights that girls generally display higher levels of self-regulation and lower levels of externalizing behaviors than boys (LaGrange & Silverman 1999; Ngun, Ghahramani, Sánchez, Bocklandt, Vilain 2011; Raver 2002). Therefore, even under similar environmental exposure, differences in self-regulation may lead boys and girls to respond differently to the same social or environmental factors. Given parents' heightened awareness of the negative ramifications of harsh parenting, the importance of cognitive support, positive discipline, and warmth, and increased gender equality in terms of the desirability of girls and therefore similar economic investments in both sexes, I suspect a greater share of the differential effects of the changes taking place in American families can be attributed to boys' more negative responses to similar types of exposure.

> *Hypothesis 4: Boys respond more negatively than girls to similar types of exposure to changes within the family.*

Given that changes in families and health may be unevenly associated with boys' and girls' behavioral development, this study tests whether the gender gap in behavioral skills has grown over time.

> *Hypothesis 5: With changes in families in recent decades, the gender gap in externalizing—and its component (lack of) self-regulation and (lack of) social skills—has grown over the last fifteen years.*

Specifically, with the rise of female headed households and/or the presence of social fathers, mothers may be busier today than they were even fifteen years ago. Single mothers bear the double burden of being sole breadwinner and parenting, while mothers with new partners (i.e. the children's social father) may experience extra demands on their attention from their new partner, which may have a more negative effect on boys than girls.

> *Hypothesis 6: Changes in families explain much of the growth in the gender gap in behavioral skills over time, even over and above the role of cognitive and other demographic and baseline health differences between boys and girls.*

In the subsequent paper, I lay out the finding that the gender gap in behavioral development has increased significantly over the past two decades. In fact, the gender gap in externalizing has nearly doubled, representing an increase in externalizing behaviors equivalent to 1/3 of a standard deviation above the gap in externalizing in the late 1980s. In this paper I document this growth and then link it to the gender reversal in higher education.

Data and Methods

In order to examine changes in the magnitude of the gender gap in externalizing, self-regulation, and social skills over time, I draw on two national samples: the Children of the 1979 National Longitudinal Survey of Youth (NLSY-C) and the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B). Children in the NLSY were born to women aged 15 to 21 in 1979. NLSY-C is particularly well-suited for exploring gender gaps in behavioral skills and their consequences for attainment because it uses direct assessments and mother interviews/surveys to gather detailed information every other year from 1986 to 2010 on the behavioral development of children from birth into early adulthood. By 2010, NLSY-C

had gathered information on the internalizing/externalizing behavioral problems (ages 6-16), temperament (2-6), and social development (ages 2-4) of approximately 6,900 children.

Based on direct observations and parental interviews/surveys, the ECLS-B collects similar information on a recent, nationally-representative sample of about 11,000 babies born in 2001 at 9 months, 2 years, 4-5 years (preschool), and Kindergarten. The ECLS-B provides a full cross-sectional range of mothers' ages at birth as late as 2001, providing at least a 15 year gap to observe how the behavioral skills gap has grown at two time-points (the late 1980s, based on the NLSY-C, and the mid-2000s, based on the ECLS-B).

Sample Restrictions

In composing my sample of children in the NLSY-C, I needed to impose certain ceiling and floor restrictions on the ages of mothers at birth. First, I had to select children who were born *late* enough such that behavioral measures would be available at age 4 beginning in 1986 (the first year externalizing items were collected). Second, I had to select children who were born *early* enough that they would be at least 22 years old by 2008 (the latest year for which we have up-to-date information on degree attainment), such that 4-year college graduation rates could be reasonably calculated. There were approximately 3,000 children sampled in the NLSY-C who were born between 1983 and 1986. In order to avoid within-family clustering, from here I restricted the sample even further to the eldest child born to a mother followed through the NLSY-79. This left me with a working sample of 2,400 children.

In order to identify as comparable of a sample of children born in 2001 to those born between 1983-1986, I restricted the children in the ECLS-B to those born to mothers

in the same age range (18-29 years) as those from the NLSY-C. This reduced my ECLS-B sample to 6,069 children. Because approximately 10% of the sample consisted of twin or higher order pairs, I randomly selected one child per mother, which reduced my sample to approximately 5,769.

Variables

The most significant challenge in variables creation was the identification of items that were directly comparable across datasets. In other words, items that were worded virtually identically, measured when children in both datasets were the same age, and collected from the same reporting party (in this case, I used maternal reports almost exclusively as this was the primary strategy deployed in the NLSY-C and therefore comparable teacher, daycare provider, and direct-observations were not available in the NLSY-C). Virtually all of the scales used here are commonly used in prior research. However, in order to construct comparable scales comprised of nearly identical measures collected at comparable ages across datasets, I restrict my scales (namely, those for externalizing, self-regulation, parenting, and family economic resources) to include only items available in both datasets.[3] The construction of my primary scales—externalizing, (lack of) self-regulation, (lack of) social skills, internalizing behaviors, parental conflict, harsh parenting, cognitive support, positive discipline and maternal warmth—are outlined in **Appendices A-D**. They will be discussed at greater length in the complete paper.

After constructing comparable scales across datasets, I ran a number of sensitivity analyses to examine the internal and predictive validity of these scales. I found high

[3] All items deemed comparable are similarly worded. Most (though not all) are based on maternal-report. A small number of items, however, are collected from differing sources across datasets. For example, the insecure attachment classification is based on interviewer assessment in the ECLS-B, but on maternal responses to Rothbart's Insecure Attachment questionnaire in the NLSY-C. Additionally, certain items pertaining to home literacy environment are based on interviewer home assessment in the ECLS-B, but on parent report in the NLSY-C.

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 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 scale. Furthermore, each subscale is highly correlated (above .90) with the complete set of externalizing items available within its respective dataset. A similar procedure was carried out in the construction of the self-regulation, internalizing, and parenting scales.

Given the wide debate in the developmental psychology, education, and family literatures about which types of behavioral skills are most closely related to school readiness and later educational achievement, I report results for 3 behavioral scales, each tapping a slightly different underlying set of behavioral skills. Externalizing encompasses both social skills (aggression, temper, how much liked by other children) and self-regulation abilities (attention and concentration). Externalizing is decomposed into each subscale: a lack of self-regulation and a lack of social skills. The lack of self-regulation scale consists entirely of the items to do with attention and concentration. Higher scores reflect a decrease in self-regulation. The lack of social skills scale consists entirely of the social skills listed earlier. Higher scores reflect more aggression, temper tantrums, and greater dislike of the child by other children.

Note that, in the NLSY-C, children's behavioral development was only observed every other year. Therefore, some children were assessed at age 4 and others at age 5. As a result, and in order to also minimize missing data in the ECLS-B, my behavioral scales at both time periods are measured at age 4 where available, and age 5 in cases where items are missing at age 4.

The explanatory mechanisms I test here include three factors of family structure, resources, and parenting, and one health mechanism. Family mechanisms include: family economic resources (mother's years of schooling at the child's birth and household income at child age 4), family structure and dynamics (the mother's relationship status to the biological father at birth and when the child is 4 years old, whether a social father is present at either time period, and the amount of parental conflict at age 4), and parenting (including harshness between ages 2-4, cognitive support at age 4, and positive discipline and maternal warmth at age 4). Child health consists of two items: whether a child was diagnosed with asthma or an ear infection by age 4. As argued previously, I include early childhood health along with the explicitly family-related variables because I conceptualize early gender differences in health as a partial outgrowth of family processes, and ones which may be linked to gender differences in behavioral development.

Both studies provide information on children's early home environments, family structures, health, parenting, cognitive and behavioral development, and demographic characteristics of parents and children. All variables used in the analyses (excluding race and indicators for birth cohort) are presented in **Table 1,** after adjusting for compositional differences by gender.

Methods

The results reported here come from a single appended dataset in which the 2001 birth cohort data (from the ECLS-B) is added to the end of data from the 1983-86 birth cohorts (of the NLSY-C). The appended data allow me to test for significant growth in the behavioral gap over time and to examine the extent to which the various family mechanisms and child health may account for the growth.

The analyses presented here make use of ordinary least squares (OLS) regression to identify associations between my family and child health mechanisms and the gender gap in behavioral skills, and associations between the gender gap in behavioral skills and education attainment. In addition, quantile regression is used in order to examine the gender gap in behavioral skills at various points in the distribution at each time period, the magnitude of the *growth* in this gap over time at various points in the distribution, and the explanatory power of my four family and child health mechanisms in accounting for this gap at various places in the distribution.

Results

Figure 1, Figure 2, and **Figure 3** present unadjusted means by time period and gender for the primary outcome and predictor variables used in the analyses. Figure 1 shows a clear female advantage in each of the educational attainment measures. Figure 2 indicates few differences by gender in children's cultural and economic resources via mother's years of schooling at birth and household income at age 4, but indicates that both have increased modestly for both genders between the 1980s and the 2000s. Figure 2 highlights not only the gender gap in externalizing at both time periods, but also the *growth in the gender gap* at higher in mean levels of externalizing for both boys and girls. This last

finding is surprising and merits some discussion, since we would not expect levels of externalizing to increase by 4 points or more for both boys and girls. For reasons that become clear in the rest of the paper, I conclude that this overall increase in means does not reflect a real increase in frequency of behavioral problems but, rather, reflects a heightened awareness of these behaviors among mothers. This heightened awareness likely results from increases in diagnoses of attention-deficit-hyperactivity-disorder (ADHD) and other behavioral illnesses as well as the rise of zero-tolerance policies for behavioral misconduct in schools, both of which have increased dramatically over the fifteen year period covered in these analyses.

Figure 4 and **Figure 5** report means for the four key family and child health mechanisms as well as in cognitive development and demographic variables by time period and gender *controlling for compositional differences within the boys and girls in my sample.* Figure 4 reveals an overall increase in children's cultural and economic resources (via increases in mothers' years of schooling at birth and household income at age 4), a slight decrease in harsh parenting, and a slight increase in both positive discipline and maternal warmth and early cognitive support at age 4. We see few changes over time by gender, with the exception of decreases in boys' average economic resources between the late 1980s and the mid-2000s. The controlled means reported in Figure 5 in particular offer support for the second hypothesis that the changes taking place in families over the past fifteen years are associated with a rise in out-of-wedlock childbearing and the presence of social fathers.

Figure 6 establishes that behavioral skills at ages 4 and 5 are important predictors of educational attainment for children born between 1983 and 1986 to mothers aged 18-29

years at birth. The first bar for each educational outcome indicates the magnitude of the male-female gap in a given educational attainment category *without adjusting for compositional differences between boys and girls.* The second bar indicates the magnitude in the gap after controlling for all family and health mechanisms and controls, including cognitive development. The third bar reveals the additional shrink in the gap in educational attainment once adjusting for differences in boys' and girls' level of externalizing. *Overall, the gender gap in externalizing accounts for roughly as much of the gap in educational attainment as all other family, health, cognitive, and other demographic factors combined.* **Figure 7** lends further support to the first hypothesis that the gender gap in behavioral development accounts for a substantial share of the gender reversal in educational attainment. It highlights that the gender gap in externalizing accounts for 16 percentage points of the gap in high school and GED completion above and beyond that explained by my family, child health, cognitive and demographic controls, approximately 10 additional percentage points of the gap in college enrollment, 4 additional percentage points of the gap in 2-year college completion, and 14 additional percentage points of the gap in 4-year college completion.

The remainder of the analyses, which will be included in the presentation of this paper, confirm the following conclusions:

1) The gender gap in externalizing, self-regulation, and social skills has nearly doubled over the last 15 years (**Figure 8**)
2) The gap is largest in the top two quartiles of the behavioral distribution (i.e. among the worst-behaved children), and it is the larger gap among these worst

behaved children that is driving the gap in externalizing, self-regulation, and social skills at the mean of the distribution. (**Figure 8**)

3) At the mean of the distribution, the growth in the gender gap in behavioral skills—and a sizable share of the original gap—is explained largely by family and health mechanisms operating in early childhood. (**Figure 9**)
4) The family and health mechanisms I test here account for a larger share of the gender gap in behavioral skills among the children in the top two quartiles of the behavioral distribution than they do for the bottom two quartiles (i.e. the best behaved children).

REFERENCES

Alexander, Karl L., Doris R. Entwisle, and Susan L. Dauber. 2003. *On the Success of Failure: A Reassessment of the Effects of Retention in the Early Grades.* New York: Cambridge University Press.

Anderson, Elijah. 2000. *Code of the Street: Decency, Violence, and the Moral Life of the Inner-City.* New York: Norton & Company Press.

Bell, M. A. 1998. "Frontal Lobe Function During Infancy: Implications for the Development of Cognition and Attention." In *Cognitive Neuroscience of Attention: A Developmental Perspective*, ed. J. Richards, pp. 287–323. Mahwah, NJ: Erlbaum.

Blair, Clancy. 2002. "School Readiness: Integrating Cognition and Emotion in a Neurobiological Conceptualization of Children's Functioning at School Entry." *American Psychologist* 57(2): 111-127.

Bollen, Kenneth. 1989. *Structural Equations with Latent Variables.* New York, NY: Wiley Interscience.

Brooks, Clem and Catherine Bolzendahl. 2004. "The Transformation of U.S. Gender Role Attitudes: Cohort Replacement, Social-Structural Change and Ideological Learning." *Social Science Research* 33(1):106–133.

Buchmann, Claudia and Thomas A. DiPrete. 2006. "The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement." *American Sociological Review* 71: 515-541.

Buchmann, Claudia, Thomas A. DiPrete, Anne McDaniel. 2008. "Gender Inequalities in Education." *Annual Review of Sociology* 343: 319-337.

Card, David. 1999. "The Causal Effect of Education on Earnings." In *Handbook of Labor Economics*, *Volume 3*, ed. O. Ashenfelter, D. Card, pp. 1802-1859. New York: Elsevier Science B.V.

Cawley, John, James Heckman, and Edward Vytlacil. 2001. "Three Observations on Wages and Measured Cognitive Ability." *Labour Economics* 8(4): 419-442.

Chase-Lansdale, P. Lindsay and Margaret T. Owen. 1987. "Maternal Employment in a Family Context: Effects on Infant-Mother and Infant-Father Attachments." *Child Development* 58(6): 1505-1512.

Cherlin, A.J., F.F. Furstenberg Jr., P.L. Chase-Lansdale, K.E. Kiernan, P.K. Robins, D.R. Morrison, and J.O. Teitler. 1991. "Longitudinal Studies of Effects of Divorce on Children in Great Britain and the United States." *Science* 252 (June 7):1386-89.

Coleman, James S. 1968. "Equality of Educational Opportunity." *Equity and Excellence in Education* 6(5): 19-28.

DiPrete, Thomas and Jennifer L. Jennings. 2009. "Social/Behavioral Skills and the Gender Gap in Early Educational Achievement." Columbia Population Center Working Paper Series No. 09-08. http://cupop.columbia.edu/files_cupop/imce_shared/DiPrete_CPRC_WPS_09-08.pdf. March 2009. Accessed 10 September 2010.

Duncan, Greg J., Chantelle J. Doswett, Amy Claessens, Katherine Magnuson, Aletha C. Huston, Pamela Klebanov, Linda Pagani, Leon Feinstein, Mimi Engel, Jeanne Brooks-Gunn, Holly Sexton, Kathryn Duckworth, Crista Japel. 2007. "School Readiness and Later Achievement." *Developmental Psychology* 43: 1428-1446.

Eisenberg, N., R.A. Fabes, I.K. Guthrie, and M. Reiser. 2000. "Dispositional Emotionality and Regulation: Their Role in Predicting Quality of Social Functioning." *Journal of Personality and Social Psychology* 78: 136–157.

Entwisle, Doris R., Karl L. Alexander, and Linda S. Olson. 2007. "Early Schooling: The Handicap of Being Poor and Male." *Sociology of Education* 80(2): 114-138.

Fagot, B. I., M.D. Leinbach, and R. Hagan. 1986. "Gender Labeling and the Adoption of Sex-Typed Behaviors." *Developmental Psychology* 22(4): 440-443.

Fagot, B. I., C.S. Rodgers, and M.D. Leinbach. 2000. "Theories of Gender Socialization." In *The Developmental Social Psychology of Gender*, ed. T. Eckes and H. M. Traunter. Mahwah: Lawrence Erlbaum Press.

Fantuzzo, J. and C. McWayne. 2002. "The Relationship Between Peer Play Interactions in the Family Context and Dimensions of School Readiness for Low-Income Preschool Children." *Journal of Educational Psychology* 94: 79–87.

Farkas, George, Robert P. Grobe, Daniel Sheehan, and Yuan Shuan. 1990. "Cultural Resources and School Success." *American Sociological Review* 55(1): 127-142.

Freeman, Charles E. 2004. *Trends in Educational Equity for Girls and Women.* Washington, D.C.: National Center for Education Statistics.

Gibbs, Benjamin. 2010. "Reversing Fortunes or Content Change? Gender Gaps in Math-Related Skill Throughout Childhood." *Social Science Research* 39: 540-569.

Goldin, Claudia. 2006. "The Quiet Revolution that Transformed Women's Employment, Education, and Family." *American Economic Review* 96(2): 1-21.

Goodman, S.H.,B. Barfoot, A.A. Frye, and A.A. Belli. 1999. "Dimensions of Marital Conflict and Children's Social Problem-Solving Skills. *Journal of Family Psychology* 13: 33–46.

Greene, Jay and Marcus Winters. 2006. *Leaving Boys Behind: Public High School Graduation Rates.* New York, NY: Manhattan Institute.

Gullo, Dominic F. and Christine B. Burton. 1992. "Age of Entry, Preschool Experience, and Sex as Antecedents of Academic Readiness in Kindergarten." *Early Childhood Research Quarterly* 7(2): 175-186.

Halpern, Diane F. 2000. *Sex Differences in Cognitive Abilities.* Mahwah, NJ: Lawrence Erlbaum Associates.

Heckman, James J. 2008. "Schools, Skills, and Synapses." *Economic Inquiry* 46(3): 289-324.

Heckman, James J. and Dimitriy A. Masterov. 2007. "The Productivity Argument for Investing in Young Children." *Review of Agricultural Economics* 29: 446-493.

Heckman, James J. and Yona Rubinstein. 2001. "The Importance of Noncognitive Skills: Lessons from the GED Testing Program." *American Economic Review* 91: 145-149.

Heckman, James, Peter Savelyev, Seong H. Moon, Adam Yavitz, and Rodrigo Pinto. 2010. "Analyzing Social Experiments as Implemented: A Reexamination of the Evidence from the HighScope Perry Preschool Program." IZA Discussion Paper Series No. 5905. July 2010. Online: http://ftp.iza.org/dp5095.pdf. Accessed 5 January 2011.

Heckman, James, Seong H. Moon, Rodrigo Pinto, Peter Savelyev, and Adam Yavitz. 2009. "The Rate of Return to the High/Scope Perry Preschool Program." IZA Discussion Paper Series No. 4533. October 2009. Online: http://ftp.iza.org/dp4533.pdf. Accessed 5 January 2011.

Hoxby, Caroline. 2000. "Peer Effects in the Classroom." NBER Working Paper No. W7867. Published online August 2000. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=240054. Accessed 10 October 2010.

Jennings, Jennifer and Thomas DiPrete. 2010. "Teacher Effects on Social and Behavioral Skills in Early Elementary School." *Sociology of Education* 83(2): 135-159.

Ladd, Gary W., Sondra H. Birch, and Eric S. Buhs. 1999. "Children's Social and Scholastic Lives in Kindergarten: Related Spheres of Influence?" *Child Development* 70(6): 1373-1400.

Laible, D. 2004. "Mother-Child Discourse in Two Contexts: Links with Child Temperament, Attachment Security, and Socioemotional Competence." *Developmental Psychology* 40: 979–992.

Laurence, Janice H. 2008. *The Military Performance of Dropouts and GED Holders*. Alexandria, VA: Human Resources Research Organization.

Lewit, Eugene and Linda Baker. 1995. "School Readiness." *The Future of Children* 5(2): 128-139.

Lin, Huey-Ling, Frank R. Lawrence, and Jeffrey Gorrell. 2003. "Kindergarten Teachers' Views of Children's Readiness for School." *Early Childhood Research Quarterly* 18(2): 225-237.

Magnuson, Katherine, Greg Duncan, and Ariel Kalil. 2006. "The Contribution of Middle Childhood Contexts to Adolescent Achievement and Behavior." In *Developmental Contexts in Middle Childhood: Bridges to Adolescence and Adulthood,* ed. A.C. Huston and M.K. Ripke, pp. 150-172. New York: Cambridge University Press.

McLanahan, Sara. 2004. "Diverging Destinies: How Children are Faring under the Second Demographic Transition." *Demography* 41(4): 607-627.

McLanahan, Sara and Christine Percheski. 2008. "Family Structure and the Reproduction of Inequalities." *American Sociological Review* 34: 257-76.

Mead, Sara. 2006. *The Truth about Boys and Girls.* Washington, D.C.: Education Sector.

Muter, V. and M.J. Snowling. 2003. *Early Reading Development and Dyslexia.* London, UK: Whurr Press.

National Center for Education Statistics. 2006. *Digest of Education Statistics.* Washington, D.C.: National Center for Education Statistics.

National Center for Education Statistics. 1993. *Public School Kindergarten Teachers' Views on Children's Readiness for School.* NCES 93-410. Washington, D.C.: U.S. Department of Education, Office of Educational Research and Improvement.

Normandeu, Sylvie and Frederic Guay. 1998. "Preschool Behavior and First-Grade School Achievement: The Mediational Role of Cognitive Self-Control." *Journal of Educational Psychology* 90(1): 111-121.

Oppenheimer, Valerie K. 1994. "Women's Rising Employment and the Future of the Family in Industrial Societies." *Population and Development Review* 20(2): 293-342.

Perry, D.G., L.C. Perry, R.J. Weiss. 1989. "Sex-Differences in the Consequences that Children Anticipate for Aggression." *Developmental Psychology* 25(2): 312-319.

Raley, S. and S. Bianchi. 2006. "Sons, Daughters, and Family Processes: Does Gender of Children Matter?" *Annual Review of Sociology* 32: 401-421.

Raver, C. 1996. "Relations between Social Contingency in Mother-Child Interaction and 2-Year Olds' Social Competence." *Developmental Psychology* 32: 850–859.

Raver, C. Cybelle. 2002. "Emotions Matter: Making the Case for the Role of Young Children's Emotional Development for Early School Readiness." University of Chicago, Harris School of Public Policy Working Paper. http://harrisschool.uchicago.edu/about/publications/working-papers/pdf/wp_02_06.pdf. July 2002. Accessed 10 September 2010.

Raver, C. C. & Knitzer, J. (2003). "Ready to Enter: What Research Tells Policymakers about Strategies to Promote Social and Emotional School Readiness among Three- and

Four-Year-Old Children." *National Center for Children in Poverty Working Paper,* Mailman School of Public Health. New York: Columbia University.

Roberts, W.L. 1999. "The Socialization of Emotional Expression: Relations with Prosocial Behavior and Competence in Five Samples." *Canadian Journal of Behavioural Science* 31: 72–85.

Rosenbaum, James E. 2001. *Beyond College for All: Career Paths for the Forgotten Half.* New York, NY: Russell Sage Foundation.

Rutter, Michael, Avshalom Caspi, David Fergusson, John Horwood, Robert Goodman, Barbara Maughan, Terrie E. Moffitt, Howard Meltzer, and Julia Carroll. 2004. "Sex Differences in Developmental Reading Ability: New Findings from 4 Epidemiological Studies." *Journal of the American Medical Association* 291: 2007-2012.

Sampson, Robert J. and John H. Laub. 1993. *Crime in the Making: Pathways and Turning Points Through Life.* Cambridge: Harvard University Press.

Schaefer, Barbara A. and Paul A. McDermott. 1999. "Learning Behavior and Intelligence as Explanations for Children's Scholastic Achievement." *Journal of School Psychology* 37(3): 299-313.

Shelton, T.L., R.A. Barkley, C. Crosswait, M. Moorehouse, K. Fletcher, S. Barrett. 1998. "Psychiatric and Psychological Morbidity as a Function of Adaptive Disability in Preschool-Children with Aggressive and Hyperactive-Impulsive-Inattentive Behavior." *Journal of Abnormal Child Psychology* 26: 475–494.

Shonk, S.M. and Cicchetti, D. 2001. "Maltreatment, Competency Deficits, and Risk for Academic and Behavioral Maladjustment." *Developmental Psychology* 37: 3–17.

Shonkoff, Jack P. and Deborah Phillips. 2000. *From Neurons to Neighborhoods: The Science of Early Childhood Development.* Washington, D.C.: National Academy Press.

Sigle-Rushton, Wendy and Sara McLanahan. 2004. "Father Absence and Child Well-Being: A Critical Review." In *The Future of Family*, ed. D. Moynihan, L. Rainwater, T. Smeeding, pp. 116-55. New York: Russell Sage Foundation.

Trzesniewski, Kali H., Terrie E. Moffitt, Avshalom Caspi, Alan Taylor, Barbara Maughan. 2006. "Revisiting the Association Between Reading Achievement and Antisocial Behavior: New Evidence of an Environmental Explanation from a Twin Study." *Child Development* 77(1): 72-88.

U.S. Department of Education, Institute for Education Sciences. 2005. *The Condition of Education 2005 in Brief* (Andrea Livingston and John Wirt, eds.). Washington, D.C.: National Center for Education Statistics 2005-095.

Wentzel, K.R. and S.R. Asher. 1995. "Academic Lives of Neglected, Rejected, Popular, and Controversial Children." *Child Development* 66: 754–763.

Wilson, William J. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Knopf.

Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: Univ. Chicago Press.

Table 1. Sample Sizes, Means, and Standard Deviations for All Variables Used in the Analyses, Controlling for Compositional Differences by Gender (Excluding Race, Gender, and Indicators for Birth Cohort)

	Late 1980s						Mid-2000s							
	Females			Males			Females			Males				
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	Min	Max
Family Cultural and Economic Resources														
Mother's years of schooling at birth	948	11.91667	2.11257	929	11.89774	2.094555	2255	12.90643	2.163796	2418	12.87242	2.216078	0	20
Household income at age 4	797	29.59934	22.96425	790	27.8986	21.39199	1604	52.15512	23.6985	1687	49.77962	24.1347	0	1057.448
Family Structure and Dynamics														
Married at birth	948	0.650844	0.476955	929	0.695371	0.460498	2255	0.577384	0.494085	2418	0.583954	0.493003	0	1
Married at age 4	948	0.648203	0.310731	929	0.665774	0.298058	2255	0.557651	0.295902	2418	0.549419	0.294046	0	1
Cohabiting at birth	948	0.11076	0.314	929	0.104413	0.305961	2255	0.202661	0.402071	2418	0.202233	0.401748	0	1
Cohabiting at age 4	948	0.024846	0.205288	929	0.044614	0.19545	2255	0.621484	0.210795	2418	0.623472	0.208977	0	1
Social father at birth	948	0.061181	0.239789	929	0.069968	0.25523	2255	0.012417	0.110762	2418	0.010339	0.101175	0	1
Social father at age 4	948	0.037129	0.144413	929	0.022392	0.140474	2255	0.145367	0.114564	2418	0.136972	0.109008	0	1
Single at birth	948	0.330169	0.470522	929	0.270183	0.444293	2255	0.268293	0.443169	2418	0.257237	0.437202	0	1
Single at age 4	948	0.33215	0.252798	929	0.306913	0.241686	2255	0.241739	0.232849	2418	0.240231	0.229906	0	1
Parental conflict scale	605	2.030105	0.063689	602	2.040887	0.062385	1443	1.857571	0.039857	1514	1.881496	0.044476	1	4
Parenting														
Harshness scale	848	1.213431	0.210376	853	1.313026	0.201726	2212	0.860312	0.159979	2369	0.990709	0.16777	0	2
Positive discipline/warmth scale	845	2.188024	0.316103	840	2.179904	0.309411	2052	3.406978	0.116892	2173	3.39341	0.121224	0	4
Cognitive support scale	840	1.293209	0.466033	836	1.396775	0.469377	2241	1.881171	0.351959	2395	1.964215	0.358693	0	5
Early Childhood Health														
Asthma diagnosis by age 4	948	0.038435	0.059954	929	0.093179	0.058321	2255	0.183842	0.076066	2418	0.240875	0.075934	0	1
Ear infection diagnosis by age 4	948	0.004518	0.050262	929	0.030911	0.051297	2255	0.410961	0.054056	2418	0.431465	0.055225	0	1
Internalizing, Cognitive, Baseline Health and Demographic Controls														
INTERN	895	3.981356	0.105706	892	4.018706	0.103042	1992	3.010636	0.105541	2131	3.046604	0.103595	2.597654	4.17
PPVT cognitive score	948	0.040333	1.009021	929	-0.02436	0.99729	2255	0.094774	0.889374	2418	-0.17945	1.087316	-3.65317	2.45
Birthweight	948	7.183412	1.224	929	7.423641	1.298478	2255	6.383467	1.84909	2418	6.615969	1.959576	0.500449	11.1875
Weeks of gestation	948	38.77426	2.087245	929	38.8676	2.099034	2255	37.6541	3.826668	2418	37.48015	3.91054	18	47
Birth order	948	1.78692	0.933342	929	1.855759	0.964159	2255	1.966741	1.04862	2418	1.905294	1.004193	1	7
Mother's age at birth	948	23.32278	2.573775	929	23.38644	2.435431	2255	23.86563	3.385488	2418	23.84822	3.406733	18	29

Figure 1. The Gender Gap in HS/GED Completion, College Enrollment, and 2- or 4-Year College Completion among Children Born in 1983-1986 to Mothers 18-29 Years

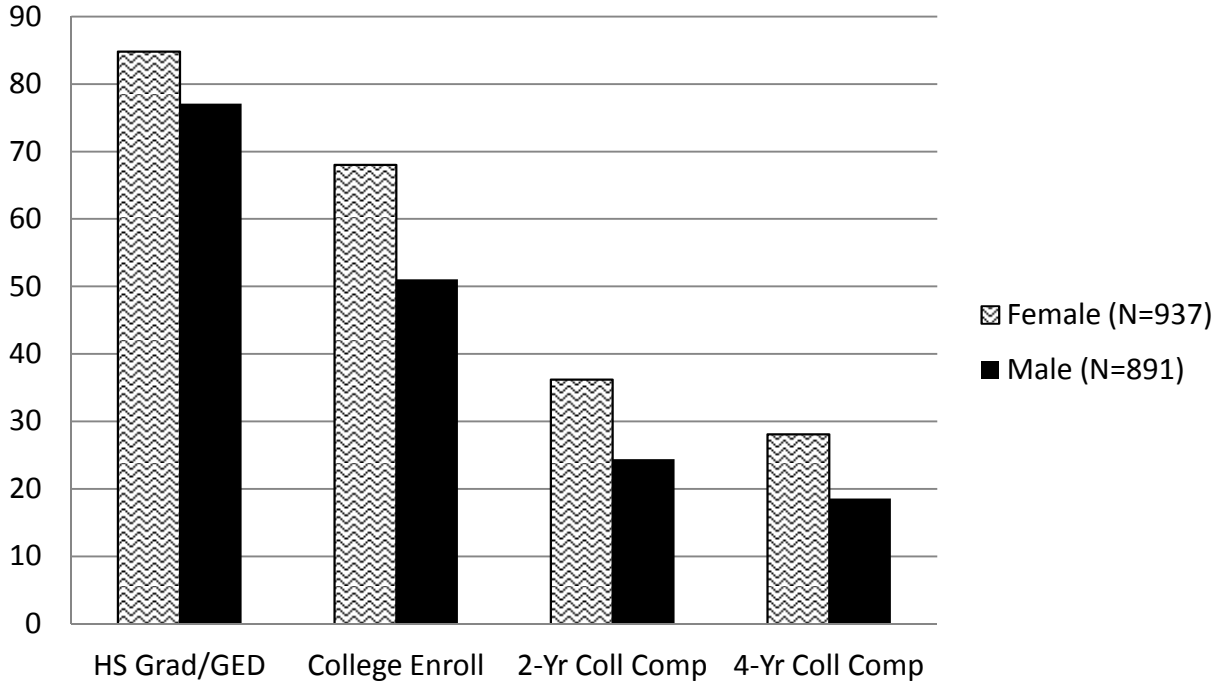


Figure 2. Means of Mother's Years of Schooling, Household Income at Age 4, and Externalizing at Age r or 5, by Time Period and Gender (Without controls)

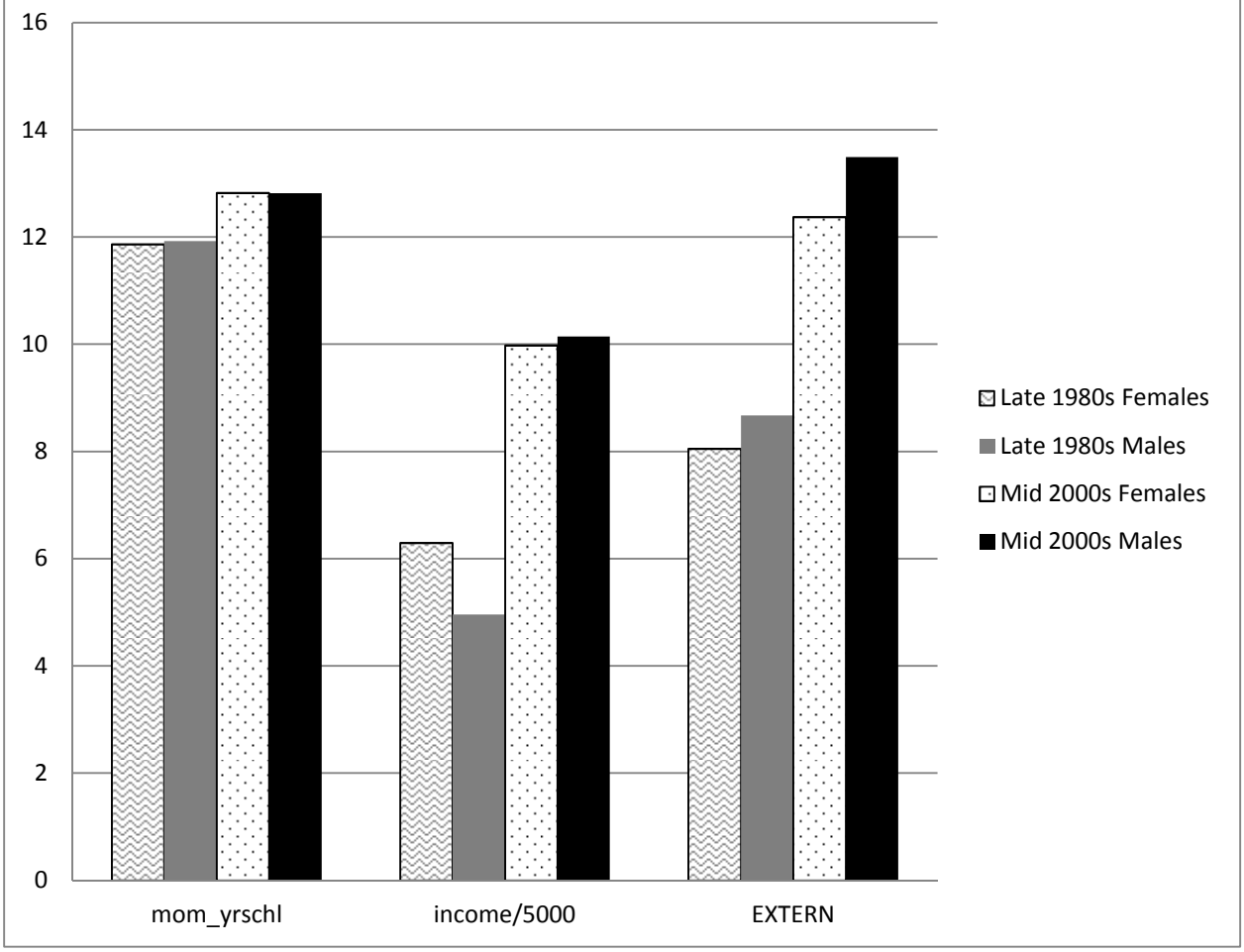


Figure 3. Means of Family Structure at Birth and Age 4, Parental Conflict and Parenting at Age 4, Child Health and PPVT Cognitive Score between Birth and Age 4, and Race, by Time Period and Gender (Without Controls)

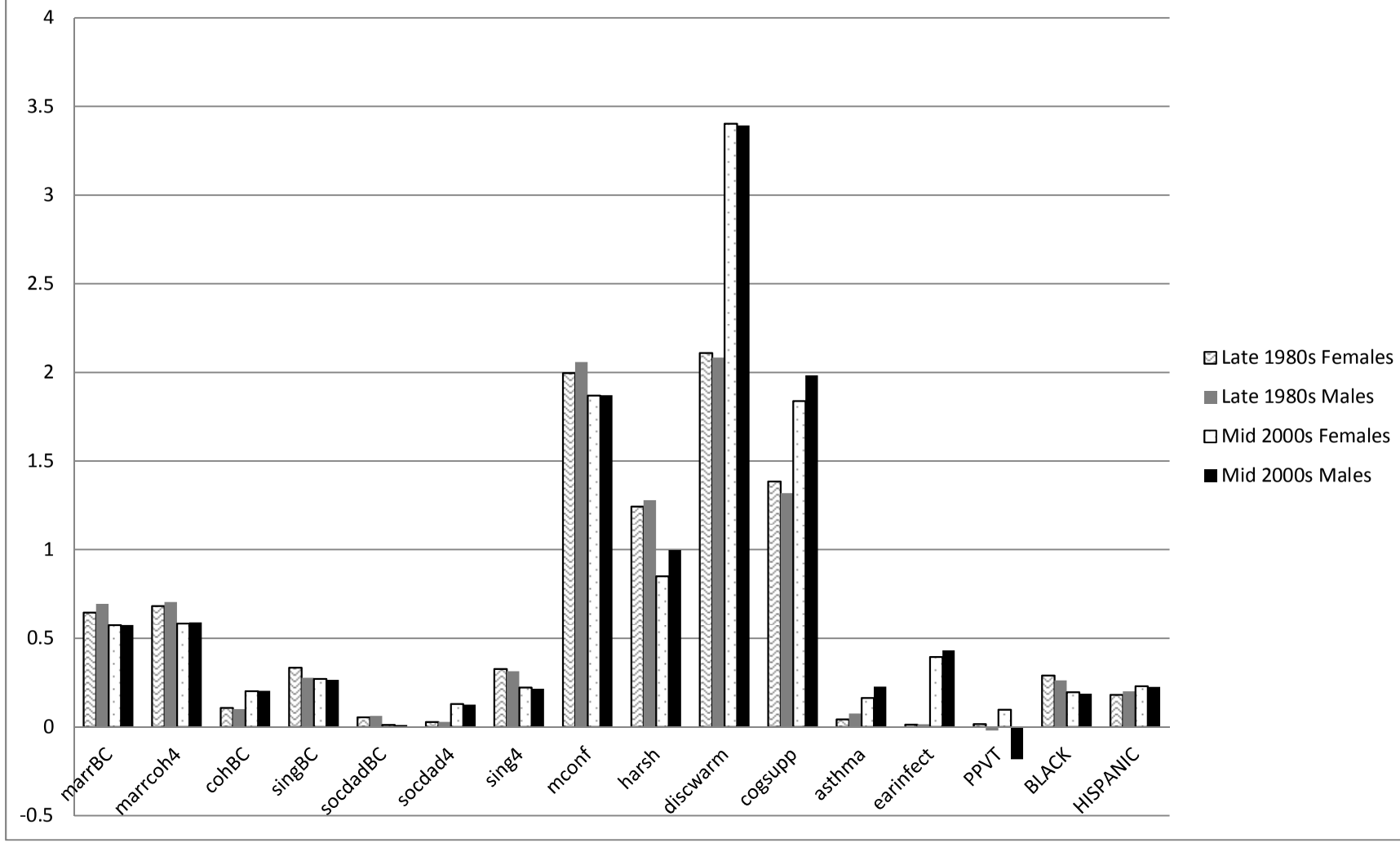


Figure 4. Means of Mother's Years of Schooling and Demographic Characteristics at Birth, and Household Income, Parental Conflict, and Parenting at age 4, by Time Period and Gender (Adjusting for Cognitive, Baseline Health, and Demographic Characteristics

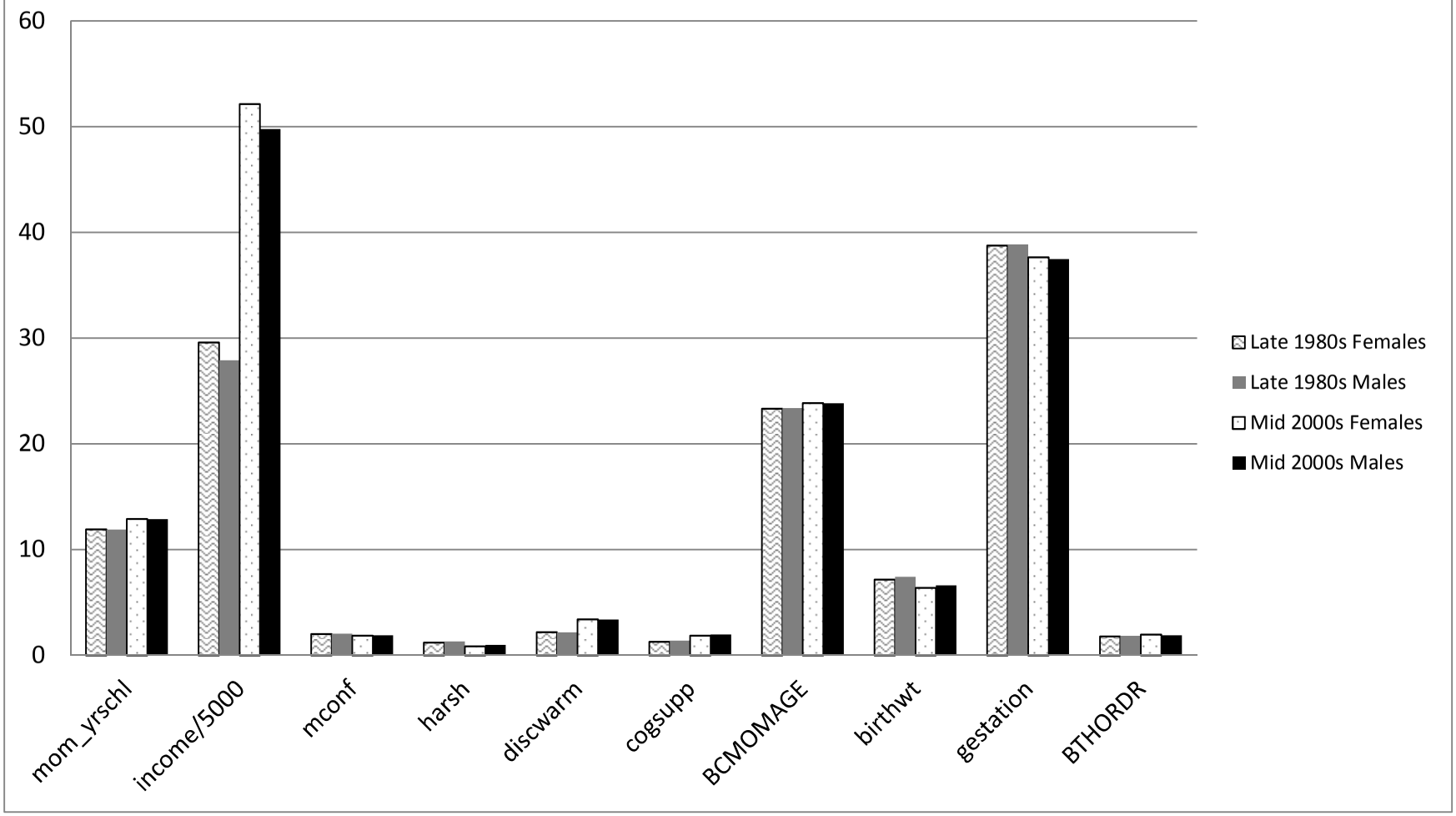


Figure 5. Means of Mother's Relationship Status at Birth and Age 4, and Child Health and Cognitive Development between Birth and Age 4, by Time Period and Gender (Adjusting for Cognitive, Baseline Health, and Demographic Characteristics)

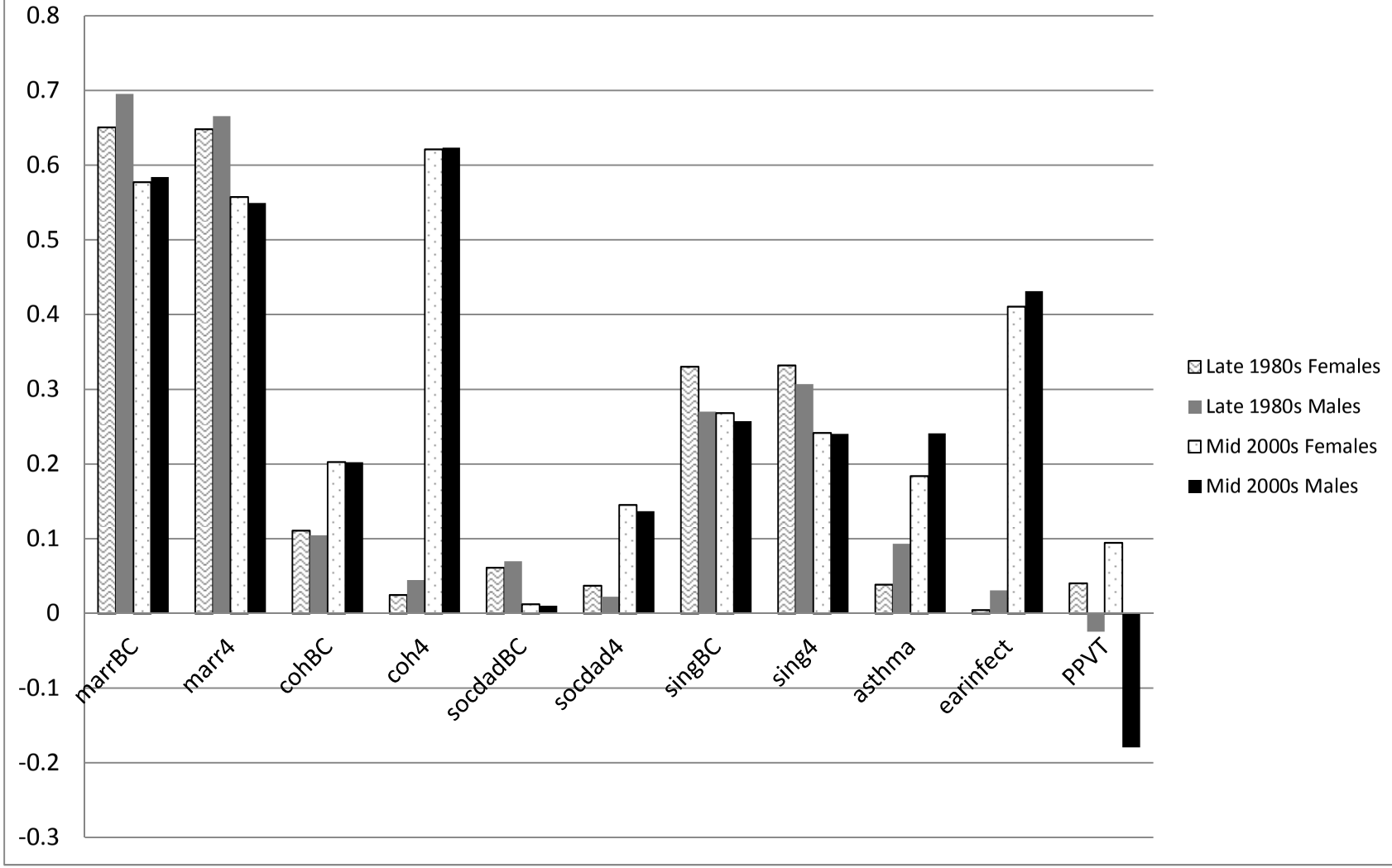


Figure 6. Gender Gap in Educational Attainment Accounted for by Mechanisms/Controls and Externalizing

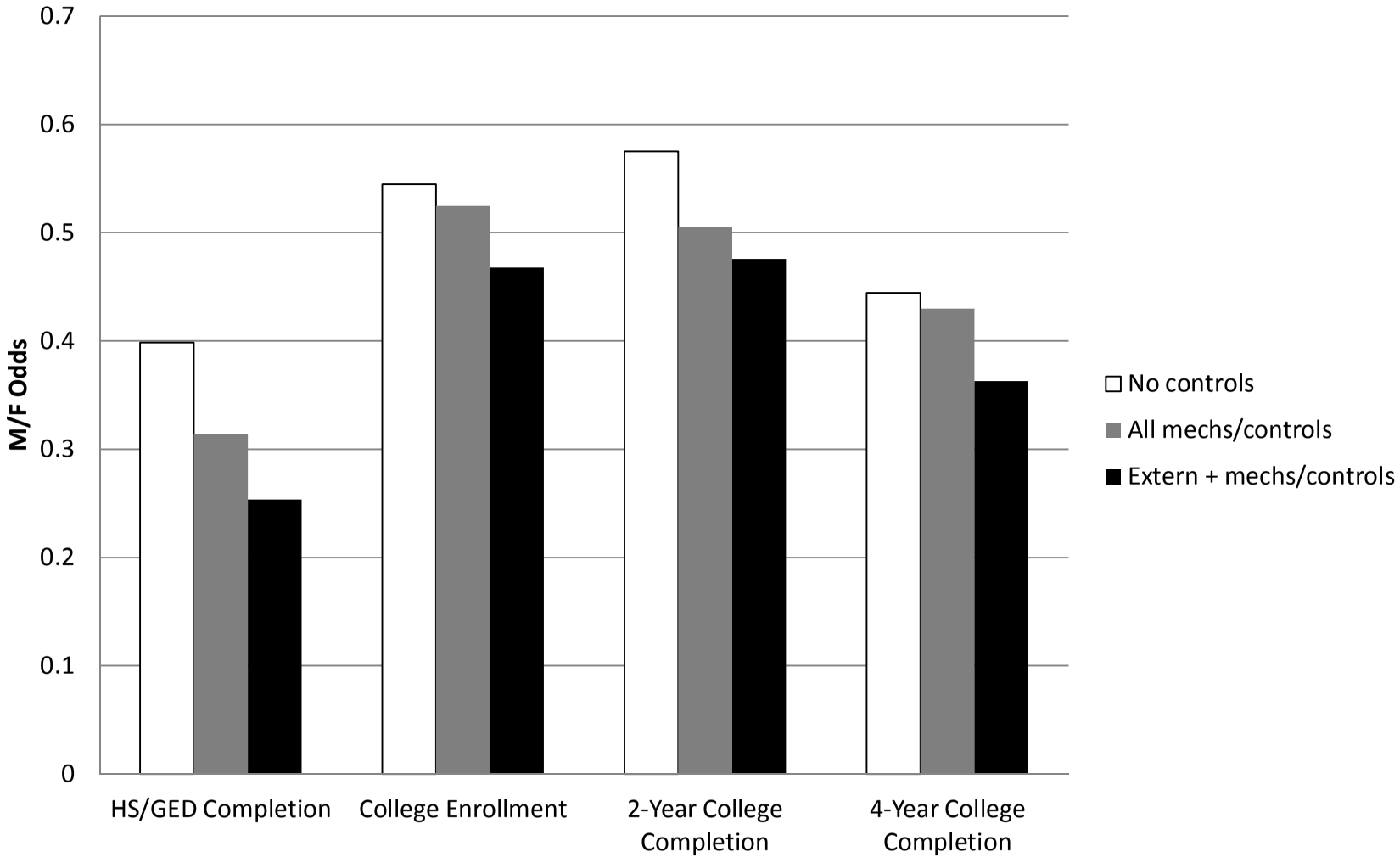


Figure 7. Percent of Gender Gap Explained by Mechanisms/Controls and Externalizing

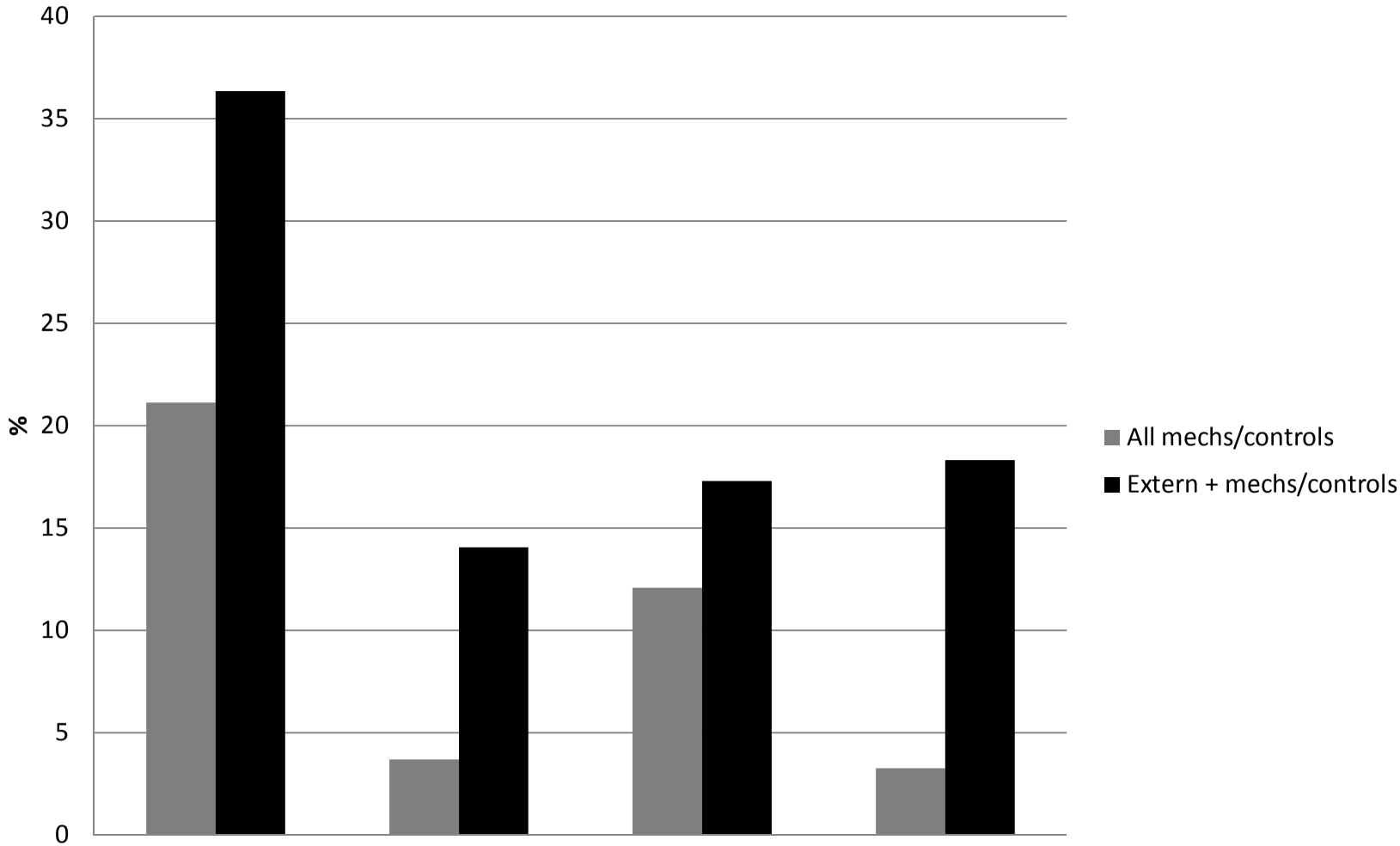
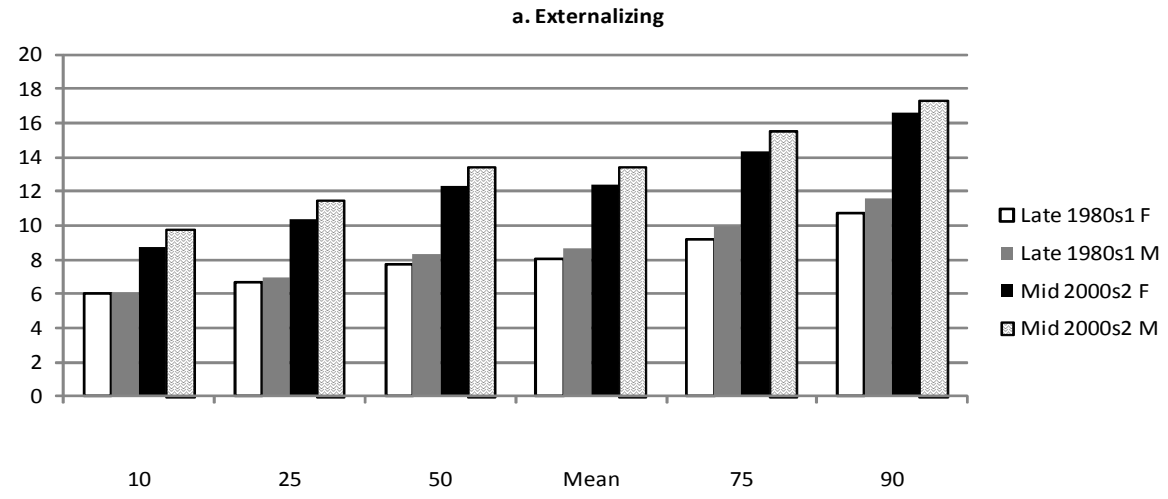
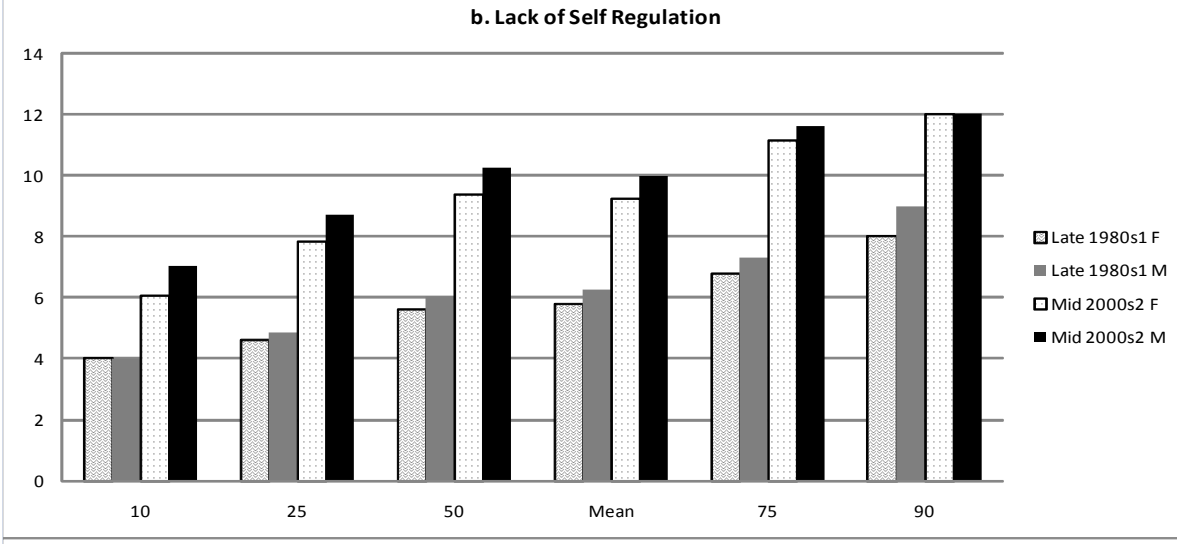


Figure 8. Female-Male Differences in Externalizing, Lack of Self-Regulation, and Lack of Social Skills Over Time at the 10th, 25th, 50th, 75th, and 90th Percentiles and at the Mean, Demographic, Health and Cognitive Controls





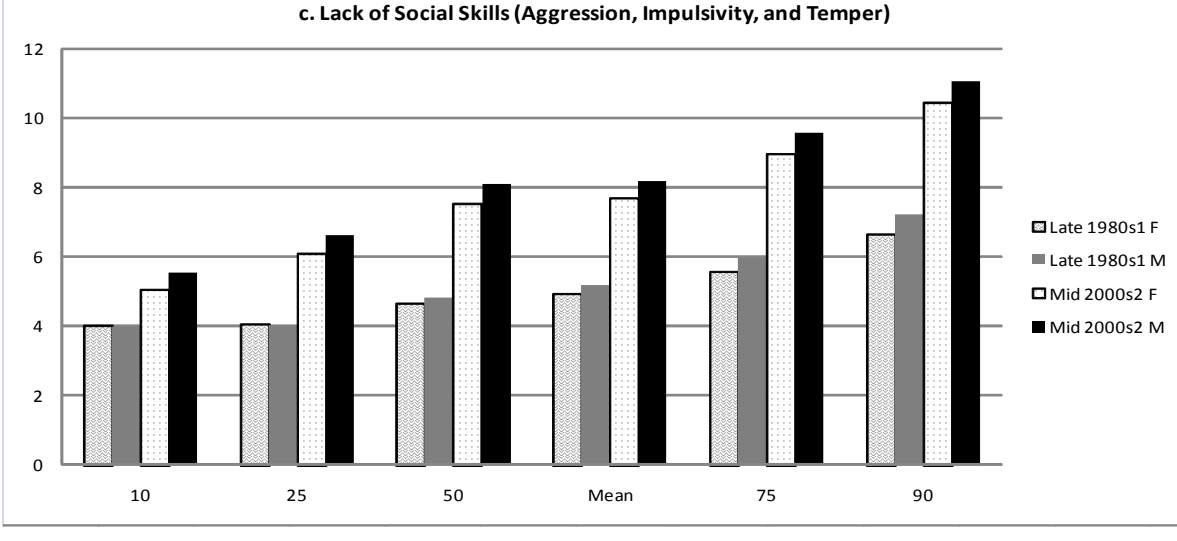
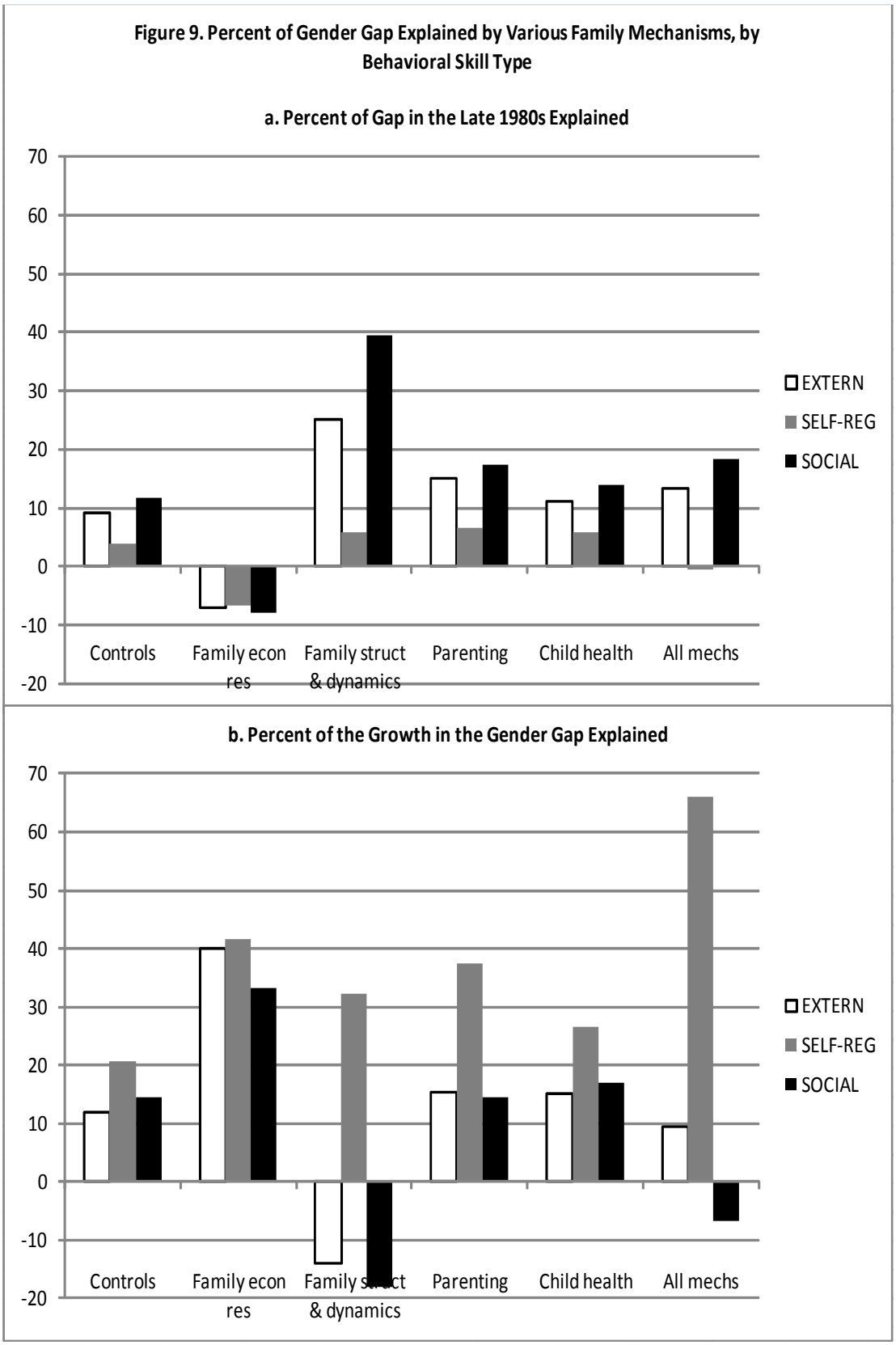


Figure 9. Percent of Gender Gap Explained by Various Family Mechanisms, by Behavioral Skill Type



Appendix A. Items in the Externalizing Behaviors Scale, by Dataset		
PKBS-2 EXTERNALIZING ITEMS AVAILABLE IN BOTH DATASETS, BY SUBSCALE[1]	PKBS-2 EXTERNALIZING ITEMS AVAILABLE IN THE ECLS-B[2]	COMPARABLE CBCL EXTERNALIZING ITEMS AVAILABLE IN NLSY-C[3]
Self-Centered/Explosive		
Has temper outbursts or tantrums	Child has temper tantrums	Strong temper and loses it easily
Attention Problems/Overactive		
Acs impulsively without thinking	Child acts impulsively	Is impulsive/acts w/o thinking
Is overly active--unable to sit still	Child is overly active	Restless, overly active, can't sit still
Antisocial/Aggressive		
Bullies or intimidates other children	Child is (not) invited to play by other children (reverse-coded)	Has trouble getting along w/ other kids
Destroys things that belong to others	Child destroys others' things	Breaks own or another's things deliberately
Bothers and annoys other children	Child annoys other children	*Not liked by other children*

[1] The full PKBS-2 externalizing scale consists of 27 items divided into three subcategories as indicated above. The subset of items used in the present externalizing scale include 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 compalins; 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.

[2]Within its more general Problem Behaviors Scale, the ECLS-B includes a total of 8 of the 27 externalizing items outlined in the PKBS-2. 2 PKBS-2 items (Child is physically aggressive and Child is angry) were *not* used in my constructed scale due to non-corresponding items in the NLSY-C. In order to correspond to the NLSY-C scale of: 1=rarely, 2=sometimes, 3=often, the ECLS-B items are rescaled from 1 (never)-5 (very often) to 1-3 using the formula: x *.5 + .5.

[3]Within the NLSY-C's more general Behavior Problems Index (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 Internalizing scale, but not in the CBCL-based internalizing 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.

Appendix B. Items in the Lack of Self-Regulation Scale, by Dataset		
Key Features of Cognitive Self-Regulation	How it is measured in the NLSY-C	How it is measured in the ECLS-B
PKBS-2 LACK OF SELF-REGULATION ITEMS AVAILABLE IN BOTH DATASETS, BY SUBSCALE[1]	PKBS-2 LACK OF SELF-REGULATION ITEMS AVAILABLE IN THE ECLS-B[2]	COMPARABLE CBCL LACK OF SELF-REGULATION ITEMS AVAILABLE IN NLSY-C[3]
Attention	1) Has difficulty concentrating, 2) Is easily confused/in a fog, 3) Has difficulty getting mind off certain thoughts	1) Has difficulty concentrating, 2) Pays attention well (reverse-coded), 3) N/A
Impulse inhibition	1) "Is impulsive; acts without thinking", 2) Is restless/overactive	1) Acts impulsively, 2) Is overly active

[1] The key features of self-regulation draw from Blair, Clancy. 2003. "Behavioral Inhibition and Behavioral Action: Relations with Self-Regulation and Adaptation to Pre-School in Children Attending Head Start." Developmental Psychobiology 42: 301–311. The items used presently are based on maternal report.

[2]In order to correspond to the NLSY-C scale of: 1=rarely, 2=sometimes, 3=often, the ECLS-B items are rescaled from 1 (never)-5 (very often) to 1-3 using the formula: x *.5 + .5.

[3]NLSY-C items draw from the Child Behavior Checklist.

Appendix C. Items in the Lack of Social Behaviors Scale, by Dataset		
PKBS-2 LACK OF SOCIAL SKILLS ITEMS AVAILABLE IN BOTH DATASETS, BY SUBSCALE[1]	PKBS-2 EXTERNALIZING ITEMS AVAILABLE IN THE ECLS-B[2]	COMPARABLE CBCL EXTERNALIZING ITEMS AVAILABLE IN NLSY-C[3]
Self-Centered/Explosive		
Has temper outbursts or tantrums	Child has temper tantrums	Strong temper and loses it easily
Antisocial/Aggressive		
Bullies or intimidates other children	Child is (not) invited to play by other children (reverse-coded)	Has trouble getting along w/ other kids
Destroys things that belong to others	Child destroys others' things	Breaks own or another's things deliberately
Bothers and annoys other children	Child annoys other children	*Not liked by other children*

[1] The full PKBS-2 externalizing scale consists of 27 items divided into three subcategories as indicated above. The subset of items used in the present lack of social skills scale include at least one item from both "social" sub-categories of the externalizing scale (self-centered/explosive and antisocial/aggressive). The complete set of self-centered/explosive items include: 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 compalins. When complete, the other subscale, antisocial/aggressive includes: 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.

[2]Within its more general Problem Behaviors Scale, the ECLS-B includes a total of 8 of the 27 externalizing items outlined in the PKBS-2. 2 PKBS-2 items (Child is physically aggressive and Child is angry) were *not* used in my constructed scale due to non-corresponding items in the NLSY-C. In order to correspond to the NLSY-C scale of: 1=rarely, 2=sometimes, 3=often, the ECLS-B items are rescaled from 1 (never)-5 (very often) to 1-3 using the formula: x *.5 + .5.

[3]Within the NLSY-C's more general Behavior Problems Index (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 Internalizing scale, but not in the CBCL-based internalizing 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.

Appendix D. Internalizing Behaviors Items Used in the Analyses, by Dataset		
FULL INTERNALIZING SCALE-PKBS-2[1]	ECLS-B: ALL INTERNALIZING ITEMS AVAILABLE[2]	COMPARABLE CBCL INTERNALIZING ITEMS AVAILABLE IN NLSY-C[3]
Social Withdrawl		
Seems unhappy or depressed	Seems unhappy	Seems unhappy, sad, or depressed
Anxiety/Somatic Problems		
Is anxious and tense	Worries about things	Too fearful or anxious

[1]The full PKSBS-2 internalizing scale consists of 15 items, divided into 2 subscales (social withdrawl and anxiety/somatic problems). Although there are only two comparable internalizing items across the NLSY-C and the ECLS-B, they each come from one of the subscales, allowing for at least partial coverage of both. All items are based on maternal report.

[2] ECLS-B uses a subset of 6 items from the PKBS-2 to create a subset of the Problem Behaviors Scale. Items originally range from 0 (rarely) to 5 (always), but are rescaled to math the range of the NLSY-C using the following formula: Y(NLSY-C)=(X(ECLS-B)*.5)+.5.

[3]The original internalizing behaviors scale in the NLSY-C consists of 7 items. Items range from 0 (never), 1 (rarely), 2 (sometimes), to 3 (often).