

**Parenting and the Reduction of Inequality:
How the Impact of Early Parenting on Achievement Varies across Class Boundaries and
with Development**

Emily K. Penner*

School of Education

University of California, Irvine

May 9, 2013

Key words: parenting, inequality, concerted cultivation, achievement

Acknowledgements: I would like to thank Greg J. Duncan and Thurston Domina for their comments.

* Please direct correspondence to:

emily.penner@uci.edu

University of California, Irvine

3200 Education

Irvine, CA 92697-5500

ABSTRACT

SES differences in parenting are implicated in perpetuating structures of inequality and widening the SES-achievement gap. This study investigates two questions addressing this relationship. First, it tests for similarities across SES in the types and intensity of parenting behaviors utilized. Second, it examines SES differences in the relationship between parenting and student achievement growth. Using exploratory factor analysis to examine data on kindergarten parenting behaviors collected in the Early Childhood Longitudinal Study – Kindergarten Cohort, I identify three dimensions of parenting: *Educational Engagement*, *Stimulating Parent-Child Interaction*, and *Discursive Discipline*. All three dimensions are used most heavily by high-SES families, but are also utilized by lower-SES parents. However, only *Educational Engagement* consistently predicts achievement growth, and it is positively associated with achievement for lower-, but not higher-SES students in first through eighth grades. Further results suggest that *Educational Engagement* is beneficial for low-SES children because it is particularly beneficial for low-achieving students, consistent with a compensatory hypothesis.

I. INTRODUCTION

The relationship between children's academic outcomes and their parent's socio-economic status (SES) is one of the most enduring findings of social science research (Coleman et al. 1966; Duncan, Brooks-Gunn, and Klebanov 1994; Duncan, Yeung, et al. 1998; White 1982). Bourdieu (1986), Becker (1964, 1993), Coleman (1988), and many others have underscored the ways in which parenting reproduces educational inequality by providing children with different levels of human, social, and cultural capital. These differences in capital, transmitted through parenting, contribute to SES differences at school entry, and continue to differentially support skill acquisition as students progress through school (Lareau 2011).

Previous research documents class-based differences in parenting practices and home environments (Burchinal et al. 2006; Dumais 2002; Farkas 2003; Hart and Risley 1995), which have been linked to differences in student achievement (Duncan and Magnuson 2005; Lareau 2011). However, Chin and Phillips (2004) argue that beliefs about parenting practices between more- and less-affluent parents are not as stark as some assert (e.g., Lareau 2011). They find that lower-SES parents share many beliefs about parenting practices with more affluent parents, but simply lack the resources to enact many of their beliefs. Amato and Fowler (2002) and Roksa and Potter (2011) further identify many commonalities in parenting behavior across SES backgrounds.

In addition to disagreements about the degree of SES similarity in parenting practices, there is also disagreement about the role of parenting in reproducing or reducing inequality and how it functions. One school of thought argues that parenting functions as a primarily symbolic process, through which the symbols of class advantage are passed to some children, but not others. In the symbolic case, we would expect higher-SES children to experience the greatest

academic benefits from parenting behaviors that support achievement, because these children possess and are best prepared to activate the markers of class background and the cultural capital they have received (Bourdieu 2000; Lareau 2011). In contrast, others argue that parenting plays a functional role and is important insofar as it produces and improves certain skills. In the functional case, since parenting is viewed as actually developing children's skills, and we would expect all children to receive some benefit from particular parenting behaviors. We might also expect a compensatory effect of parenting for lower-SES children whose parents engage in particular behaviors (Morgan et al. 2011). Echoing the disparate views of the function of parenting, a growing body of research has produced conflicting conclusions about whether particular parenting behaviors are more beneficial to the achievement of high- or low-SES children (Crosnoe et al. 2010; De Graaf, De Graaf, and Kraaykamp 2000; DiMaggio 1982; McNeal 1999).

To reconcile these discrepant findings, I test whether parents' efforts to transmit advantage and cultural capital through parenting practices and behavior yield equal benefits in the form of achievement for students of different SES backgrounds. In particular, I examine whether specific groups of parenting practices are uniformly utilized and uniformly effective in improving student achievement across SES.

Using data from the Early Childhood Longitudinal Study – Kindergarten Cohort, the present study makes three contributions to this literature. First, I investigate how parenting practices vary by SES. Instead of including only preselected variables thought to resemble specific theoretical constructs of parenting (e.g. Bodovski and Farkas 2008; Cheadle 2008), I examine a wide array of self-reported parenting behaviors from when the child is in kindergarten, taking advantage of a broader array of information on parenting, and use

exploratory factor analysis to identify the parenting behaviors that cohere into the most prominent parenting practices. This approach yields three dimensions, which I term *Educational Engagement*, *Stimulating Parent-Child Interactions*, and *Discursive Discipline*, which together resemble many of the previous constructs used to examine concerted cultivation. I use these dimensions to test the degree to which there are commonalities in parenting practices across SES. Second, I evaluate whether the relationship between parenting practices at school entry and achievement growth varies across class backgrounds. Using the three dimensions described above, I examine competing notions of the ways in which parenting practices contribute to or counteract inequality, and can evaluate whether each type of parenting has a differential relationship with achievement by SES. Finally, I extend earlier investigations of the relationship between parenting and child achievement at one later time point (Bodovski and Farkas 2008; Roksa and Potter 2011), by examining whether kindergarten parenting practices are related to student achievement growth throughout elementary and middle school.

I find evidence of SES differences in degree of usage of each of the parenting dimensions identified. In particular, *Educational Engagement* varies across SES levels much more than other parenting behaviors. Despite evidence of SES differences in usage, I also find evidence of a differential relationship between *Educational Engagement* and SES that persists from first through eighth grades. Use of *Educational Engagement*, is associated with larger achievement gains for lower-SES students than for higher-SES children. However, this differential relationship is completely attenuated by a differential relationship between prior achievement and *Educational Engagement*, which suggests that this type of parenting is especially beneficial for lower-SES children because it is especially beneficial for children who have lower kindergarten achievement. This is consistent with a compensatory hypothesis (Morgan et al.

2011) and a cultural mobility model (DiMaggio 1982), as well as other work showing that disadvantaged students benefit more from parental educational involvement, academic stimulation, and engagement than advantaged children (Crosnoe et al. 2010; De Graaf et al. 2000; Domina 2005).

These findings, which are suggestive of a functional and compensatory role of parenting, contradict Bourdieu's (2000) more symbolic notions about the relationship between parenting and cultural capital. While parenting is still implicated in the reproduction of inequality, this paper challenges the idea that specific parenting behaviors, which presumably confer cultural capital onto elite children to support achievement, would not work for the disadvantaged (Bourdieu 2000: 266-7). Instead, I find that the very parenting practices thought to be markers of "middle class" parenting are most effective at improving achievement among lower-SES students.

This paper proceeds as follows: Section II reviews the literature, paying particular attention to SES differences in parenting practices and the differential impact of parenting by SES. Section III describes the data and methods. Section IV presents the results, and Section V concludes by discussing the implications of my findings.

II. LITERATURE REVIEW

SES Differences in Parenting Practices

A wide array of evidence suggests that differences in parenting practices and behaviors between upper-, middle-, and working-class parents contribute to SES differences in achievement. For example, relative to working-class parents, affluent parents provide more stimulating home environments (Brooks-Gunn, Klebanov, and Duncan 1996; Burchinal et al. 2006), they talk more regularly with their children, they use more complex verbal utterances in

their talk, and they engage in more verbal reasoning with their children (Farkas and Beron 2004; Hart and Risley 1995; Heath 1983; Landry et al. 2000; Lareau 2011). Higher-SES parents also provide more at-home educational experiences and provide their children with more access to educational materials and other resources while at home and during out-of-school time (Dumais 2002; Duncan and Magnuson 2005; Epstein 1987; Ono and Tsai 2008). More-affluent parents are also more actively involved in their children's schooling (Sui-Chu and Willms 1996). Finally, affluent parents differ from lower-SES parents in their approaches to discipline, reporting lower usage of harsh disciplinary techniques, such as spanking (Duncan and Magnuson 2005; Giles-Sims, Straus, and Sugarman 1995; Lansford et al. 2004). Lareau (2011) summarizes these differences, arguing that parents from different class backgrounds use distinctly different "logics of parenting" which promote different types of school-specific training and contribute to diverging achievement patterns across class boundaries. These class-based differences in parenting practices suggest starkly different early home environments, which may contribute to the formation and growth of class-based achievement gaps (Reardon 2011).

In contrast, Amato and Fowler (2002) find that, "a core of common parenting practices appears to be linked with positive outcomes for children across diverse family contexts" (703). It may be possible that, although some parental behaviors differ by SES background, there are some practices that are shared across SES levels. In this case, perhaps the usage of some parenting practices is much more overlapping than previously argued, and instead differences in the intensity of their use lead to differences in achievement. This would be consistent with Roksa and Potter (2011), who found commonalities in parenting behaviors across SES, but also identified differences in the intensity of their use.

The Differential Impact of Parenting by SES

In addition to the debate about whether there are SES-based differences in the type or intensity of parenting practices, it is also unclear whether parenting behaviors have a uniform relationship with student achievement when used by parents of different SES levels. The theoretical literature on the transmission of advantage has some predictions about whether parenting is equally effective across SES boundaries, but the empirical literature finds mixed evidence on whether children from different SES backgrounds benefit equally or differentially from specific parenting practices and behaviors. One important contrast is whether parenting is seen as impacting achievement and inequality through symbolic or functional means.

Theories on the transmission of advantage typically adopt a symbolic view on parenting. Such theories suggest that parenting reproduces class advantages by conferring symbolic markers of class status across generations. Differences in how these markers are transmitted stem from differences in parenting models and behaviors adopted by parents from different social classes (Bowles and Gintis 1976; Farkas 2003; Lareau 2011). Parents of different classes convey different types of preferences, behaviors, and institutional knowledge to their children, through which children internalize different notions of the structures of opportunity and constraints available to them. These differences in parents' cultural beliefs, attitudes, and practices provide children with different types of cultural capital that shape their interactions and future experiences in institutional settings, like school (Bourdieu 1986; Bourdieu and Passeron 1990), and differentially impact students' academic progress (DiMaggio and Mohr 1985).

Thus, differences in class background prevent the benefits of parenting practices from being activated equally, so that even if parenting practices cross class boundaries, they are not uniformly effective in promoting academic and social success. It is these differences in the ability to use capital in an institution such as an academic setting that have a stratifying effect on

how parenting practices can impact student achievement (Lareau 2011). Lareau and Horvat (1999) further argue that it is the interaction between the cultural capital one possesses, the skill one has at activating this capital, and the value that this capital has in the setting in which one tries to activate it that determines how much social reward one will reap (c.f. Bourdieu and Passeron 1990). This tradition would predict that a higher-class child would be more likely to reap academic benefits from parenting practices than a lower-class child because their parents not only transmit greater amounts of cultural capital¹ to them, but because they also receive more situation-specific cultural training needed to access this capital in a school (Bourdieu 2000).

An important set of competing hypotheses, tested by DiMaggio (1982), also builds on the notion that cultural capital functions symbolically to mediate the relationship between family background and academic success and articulates the possible mechanisms underlying this process. The cultural reproduction model supports the notion that the returns to demonstrations of cultural capital will yield greater academic benefits for students from high status homes. In contrast, the cultural mobility model suggests that the impact of cultural capital will be larger for disadvantaged youth who, when able to display such capital, gain more in upward mobility than children who are already advantaged.

A different school of thought suggests that parenting serves a functional purpose in imparting skills which children can devote to academic achievement in schools. In contrast to a symbolic idea of parenting, which highlights how parenting transmits the markers of class, a functional perspective suggests that parenting behaviors actually help to develop and create skills and abilities. By extension, differences in parenting behaviors contribute to inequalities in school performance because of their differential promotion of children's skills (Hart and Risley 1995; Farkas and Beron 2004). Kohn (1989) suggests that, "class differences in parental values and

child-rearing practices influence the development of the capacities that children will someday need,” (200) in his discussion of how parents participate in the perpetuation of inequality.

While in general, theories utilizing a functional perspective argue that higher-SES children are best positioned to excel in school because they can build on already stronger skills (Cunha et al. 2006; Heckman and Masterov 2007), another perspective suggests that initially less skilled children to acquire academic skills more quickly than those who entered school at higher skill levels and catch up to their higher skilled peers (Morgan et al. 2011). While Morgan and colleagues examine how systematic instruction in schools could contribute to this narrowing of skills, a similar argument could be made for the role of parenting in narrowing SES-related skills gaps at school entry. Were this hypothesis true, children who were the lowest-SES would benefit most from parenting in terms of later achievement gains, rather than the highest-SES children.

Theory thus provides competing explanations for whether specific parenting practices transmit advantage or counteract it. It likewise inconclusive about whether parenting functions in a symbolic or functional way. Findings from empirical work examining this relationship are likewise inconclusive. Instead, the literature has produced a scattered set of findings in work examining the differential relationship between parenting and achievement across SES. For example, Roscigno and Ainsworth-Darnell (1999) find that higher-SES students experience greater achievement returns from cultural trips and family educational resources than lower-SES students. In contrast, De Graaf, De Graaf, and Kraaykamp (2000) identify that parental reading behavior is more beneficial for the schooling success of disadvantaged students than for advantaged students. Similarly, Domina (2005) finds that low-SES students benefit more from parental school involvement than middle- and high-SES students. Alternatively, Amato and Fowler (2002) find no evidence that the association between support, monitoring, or harsh

parenting practices and student achievement or behavior varies across SES groups. Roksa and Potter (2011) examine a wider array of parenting behaviors than many previous studies, but their results also suggest a mixed picture, with some types of parenting (e.g. concerted cultivation) having a positive relationship with achievement for middle-SES children other types having a positive relationship with achievement for lower-SES children (e.g. high status cultural activities), and still other types having a positive relationship with achievement for children across SES backgrounds (e.g. parental educational expectations). This divergence may stem from the fact that researchers tend to examine only a single or a few aspects of parenting at a time, rather than considering a more global view of parenting that encompasses a wide variety of parenting behaviors.

While several studies have examined the interaction between SES and parenting, they are still relatively narrow in scope. To the extent that it has been done, previous work has been confined to interactions with SES and a single or selective group of parenting behaviors, leading to a literature mired in a conflicting set of results. Thus, an examination of a wide array of parenting behaviors, not only those traditionally thought to be part of cultural capital, would help to adjudicate between these competing findings. This paper provides such a comparison, bringing the largest representative available data to bear on this question, and examining the lasting relationship between these practices and achievement throughout childhood and into adolescence.

Research Questions

Research identifies a robust relationship between parenting and achievement, but two important debates remain. First, while some research suggests that the prevalence of parenting practices and behaviors are not uniform across class boundaries (Lareau 2011), other studies

suggest that many parenting behaviors permeate class boundaries (Amato and Fowler 2002). Thus, the degree to which parenting practices are shared across SES is still uncertain. Even less is known about whether the returns to parenting are uniform across SES. To the extent that differences in the relationship between parenting and achievement exist, it is also unclear whether more- or less-affluent students will benefit more from these behaviors. To identify SES variation in early parenting behaviors and their relationship with student achievement, this paper is guided by the following research questions:

1. *To what degree do kindergarten parenting practices vary by SES?*
2. *Does the relationship between kindergarten parenting and student achievement vary by SES?*

III. DATA & METHODS

I examine SES differences in the use of parenting behaviors and estimate the differential relationship between kindergarten parenting and elementary and middle school achievement growth by socio-economic status using the Early Childhood Longitudinal Study – 1998 Kindergarten Cohort (ECLS-K). Funded by the U.S. Department of Education and overseen by the National Center for Education Statistics (NCES), the ECLS-K collected a nationally representative sample of children entering kindergarten in 1998 and followed them through eighth grade. The full ECLS-K sample includes 21,260 kindergarteners who were sampled from 1,277 schools in 100 counties across the U.S. Data from the sampled children were also collected in the spring of kindergarten (1999), first grade (2000), third grade (2002), fifth grade (2004), and eighth grade (2007). I use data from the fall and spring of kindergarten, and the spring of first, third, fifth, and eighth grade. The ECLS-K offers the largest nationally representative

sample with which to follow students from school entry into adolescence, which includes detailed parenting behaviors, and is therefore well suited for addressing these questions.

The analyses for this paper utilize data from ECLS-K respondents who participated in the fall kindergarten student survey and have non-missing fall kindergarten parent survey data. The sample excludes children who did not participate in the baseline kindergarten wave, who are missing baseline parent survey data, and who are missing the child's achievement test data. Applying the kindergarten parent panel weight for the full survey, the analysis sample includes 12,887. Because of attrition, by eighth grade, the sample contains 6,636 students with non-missing data for at least one eighth grade assessment.² The parent panel weights for the full sample for each wave and the corresponding PSUs are used to address the representativeness of the sample and attrition in the later grades. Although very little baseline data is missing (the variable with the highest levels of missing information is the kindergarten General Knowledge IRT score, which is missing for 7 percent of the cases), I use multiple imputation to handle missing data in the independent variables. Conditional on the above sample restrictions, multiple imputation is performed using STATA 12's *mvn* command and 10 imputed datasets are created for analysis.³

Achievement Outcomes

The outcomes of interest in this paper are standardized reading and math IRT scores from the spring of first, third, fifth, and eighth grades. Supplementary analyses also use science IRT scores from grades three, five, and eight. The IRT instruments were designed particularly for the ECLS-K, but were based on existing instruments. The mathematics and reading IRT scores were collected in one-on-one assessment sessions with the child by trained assessors. The first grade reading assessment focused on basic skills such as print familiarity, letter recognition, beginning

and ending sounds, recognition of common words (sight vocabulary), and decoding multisyllabic words; vocabulary knowledge such as receptive vocabulary and vocabulary-in-context; and passage comprehension. The tests continue to add complexity with each subsequent grade. The eighth grade reading assessment also evaluated basic skills, but placed a greater emphasis on reading comprehension, including initial understanding, developing interpretation, personal reflection and response, and demonstrating a critical stance. The mathematics assessments from the first through eighth grades evaluated students' knowledge of number sense, properties and operations; measurement; geometry and spatial sense; data analysis; statistics; and probability, patterns, algebra, and functions.

Parenting Practices

This paper provides an expanded operationalization of parenting practices thought to promote student achievement through the transmission of cultural capital. It builds on many of the parenting practices identified by Lareau (2011) as concerted cultivation, such as organizing children's leisure activities, working to actively foster children's talents, opinions, educational interests, and skills, and taking an active role in their children's schooling. This analysis includes all of the measures examined in the empirical work using the ECLS-K to test concerted cultivation to date (Bodovski and Farkas 2008; Cheadle 2008; Cheadle and Amato 2011), as well as many other aspects of parenting. It also examines the contributions of other parenting behaviors found to be positively associated with achievement, such as positive discipline, positive home environment, early academic stimulation, and parental school involvement (Bodovski and Youn 2010; Bradley, Caldwell, and Rock 1988; Desimone 1999; Steinberg et al. 1992). Many of these variables are similar to those used in evaluations of the quality of the home environment, such as the Home Observation for Measurement of the Environment (HOME)

(Caldwell and Bradley 2003). However, where prior studies examined individual domains of parenting behavior, instead I examine 55 variables of parent behaviors and practices from the ECLS-K to determine whether multiple dimensions underlying parenting practices that impact student achievement exist. I focus primarily on parent reports of parenting practices and behaviors collected from the parent interview during either the fall or spring of kindergarten.⁴ I also include one teacher reported variable from the teacher interview asking whether the child's parents attended parent-teacher conferences.⁵ This approach also allows me to use as much data as possible to examine these relationships, and to evaluate whether other variables or parenting dimensions that were previously overlooked have an important relationship with student outcomes.

I use exploratory factor analysis to identify latent constructs of parenting from the identified list of parenting practice variables within the ECLS-K. Exploratory factor analysis using a varimax rotation suggests three separate factors of parenting with Eigenvalues greater than 1.0.⁶ Variables with factor loadings greater than .35 are retained and used for generating predicted factor scores.⁷ A listing of variables that load onto each factor and the proportion of variance explained by each factor, as well as the variables included in the analysis that did not load onto any factor at loadings of .35 or greater, are presented in Appendix A.⁸ Moving forward, I use the term parenting dimension interchangeably with factor to refer to the three factors identified in the factor analysis.

Of the three factors, one of them, which I term *Educational Engagement*, aligns very well with several of the behaviors Lareau identified as concerted cultivation. This factor also has the highest Eigenvalue (3.17). It is comprised of items relating to parental involvement in schools, such as volunteering in the child's class, having educational resources in the home, such as

books and computers, and providing the child with enrichment activities outside of school time, such as sports and dance. These behaviors and practices represent an engaged stance towards the child's education inside and outside of the home.

The second factor, which comprises a different facet of concerted cultivation, appears to measure what I call *Stimulating Parent-Child Interaction*, and includes variables about activities that parents do with their child at home, such as art projects, telling stories, and building blocks. Every factor loading onto this construct is a type of *Stimulating Parent-Child Interaction* indicative of a stimulating dyadic relationship (Dodici et al. 2003; Estrada et al. 1987). These activities also likely involve a lot of talking between parent and child and thus connect with work identifying the role of children's vocabulary development in promoting later achievement and achievement gaps (Farkas and Beron 2004; Hart and Risley 1995).

The third factor, which I term *Discursive Discipline*, includes variables about how the parent would respond if the child hit them, such as requiring the child to apologize or giving them a warning. This factor represents an approach to discipline that involves discussion, negotiation, and verbal reasoning rather than physical punishment. It connects well with the aspects authoritative discipline strategies identified by Dornbush et al. (1987) that are positively associated with academic achievement. These types of disciplinary practices are related to Lareau's (2011) ideas of parents who prize reasoning rather than physical force as a solution to conflict and problems.

Given that the first factor matches concerted cultivation well, but the other factors also pick up some additional parts of the concept as well, it seems important to consider the relationships between these dimensions and child outcomes in parallel rather than individually or as one unified construct. In addition, several of the variables used in empirical work examining

concerted cultivation (see e.g., Bodovski and Farkas 2008) do not load onto these three factors.⁹ At the same time, the variables that do load on to these three dimensions are central to Lareau's description of concerted cultivation even if they do not encompass the full range of behaviors she identified. This approach is thus useful for examining the relationships between several sub-components of concerted cultivation and student outcomes, highlighting that concerted cultivation practices may not always occur together or with equal intensity, and disentangling the relationships of the various dimensions with achievement.

Control Variables

Control variables are drawn from the fall of kindergarten. A global measure of *SES* is comprised of *parents' educational attainment, family income, and parental occupational prestige* and was created by the NCES. This variable is standardized for analysis. A dichotomous variable is included for if the child is *female* (1 if female, 0 if otherwise). Race/ethnicity is measured using a series of dichotomous variables for *black, Hispanic, Asian, and other race* (1 if each racial category, 0 if otherwise), with *white* serving as the reference category. Models also control for *age in fall of kindergarten (standardized)*, if the student is a *first-time kindergartener*, and *birth weight in pounds*. Controls for family type are included using dichotomous variables for *single parent family*, and *other family type* (1 if this family type, 0 if not), with *two biological parent family* omitted. Mother's age at first birth is measured using two dichotomous variables for *mom above 30 at first birth*, and *mom a teen at first birth*. Controls for whether the mother or child received *Women, Infant Children benefits (WIC)* are combined into one dichotomous variable (1 if either received WIC benefits, 0 if not). Finally, models include controls for fall kindergarten *reading, math, and general knowledge IRT scores* in order to examine achievement gains occurring during school. These control variables are drawn from previous work examining

achievement gaps (Fryer and Levitt 2004), and from prior empirical examinations of concerted cultivation (Bodovski and Farkas 2008; Cheadle 2006, 2008). Many of the selected variables are correlated with SES, however, they allow for an examination of the influence of SES over and above these demographic characteristics.

Table 1 provides descriptive statistics for the test score outcomes, fall kindergarten test score controls, and demographic control variables for the full sample and by SES quartile, calculated using parent panel weights for the kindergarten wave. The penultimate column reports the p-value from an F-test examining whether the variable in question exhibits statistically significant differences across SES groups. Test scores increase with SES, amounting to differences between the highest and lowest SES quartiles of 1.0 to 1.3 standard deviations depending on the achievement test and grade. In addition to the test score differences, more affluent children are slightly older, born to an older mother, and weighed more at birth; more of them are white, live in married, two parent households, and fewer of them received WIC than less affluent children.

[Insert Table 1 about here]

Analysis Strategy

To examine the relationship between parenting practices and student outcomes, I use OLS regression with fixed effects for each child's fall kindergarten classroom. Using fixed effects amounts averaging coefficients from regressions run separately for children who share the same kindergarten classroom and thus controls for anything, measureable or not, that leads parents to place their children in different classrooms or schools.¹⁰ This includes features, such as racial composition of the class and number of students, but it also includes features like supportiveness of classroom environment, which is more difficult to measure. Importantly,

classroom fixed effects also hold constant features of the larger school and neighborhood, such as affluence and safety of the environment, which allow me to isolate the relationship between parenting and student outcomes, irrespective of classroom, school, and community environment. Inclusion of these fixed effects varies by model and is indicated in the results tables.

The dependent variables in these models are the children's math and reading IRT scores in the spring of first, third, fifth, and eighth grades. In addition to the fixed effects, these models include controls for fall kindergarten IRT scores in reading, math, and general knowledge. As a result, the regression coefficients should be interpreted as changes in math or reading from kindergarten until first (or, in later tables, subsequent) grades, rather than as test score levels in the outcome grades, among children within the same classrooms.¹¹ To test whether the relationship between parenting and achievement varies by SES, I include interactions between each parenting construct and SES in separate models.

Finally, I examine one possible mechanism that might account for SES variation in the relationship between parenting and achievement. Drawing on Morgan et al.'s (2011) compensatory hypothesis, I consider whether *Educational Engagement* might be more effective for low-SES students because it is more effective for low-ability students. Specifically, I include an additional interaction between SES and fall kindergarten achievement in addition to the interaction between SES and parenting, testing whether the SES variation in the relationship between parenting and student achievement can be attributed to the differential effects of parenting for students of high and low ability.

In addition to these primary models, I run several supplemental versions of these models to examine the robustness of my results. I estimate the same models without multiple imputation, using list-wise deletion for missing cases, and find a similar pattern of results. I also estimate the

above-described models without the kindergarten test score controls to examine differences in the relationship between parenting behaviors and later test score levels rather than test score gains. These models also follow the same pattern of results as the models which include the kindergarten test score controls. Models run without classroom fixed effects, which no longer restrict comparisons to within-classroom differences, also return the same pattern of results. To reduce bias due to unobserved factors relating to prior achievement and selection into schools, the version of the model presented below continues to include both fall kindergarten test scores and classroom fixed effects.

In addition to these analytical sensitivity analyses, I also try several supplementary models based on substantive alternatives. In addition to issues of selection into schools and prior achievement, some might worry that parents are compensating for child behavior in their decisions about parenting and that this may influence both parental behavior and student outcomes. To account for this possibility, I estimate alternative models which include the parent and teacher ratings of the child's behavior from the fall of kindergarten that are described above. The variables used in these models include a parent report of whether the child is less well behaved than other children (coded 1 if less well behaved and 0 if equally or more well behaved), and standardized fall kindergarten teacher ratings of the child's internalizing and externalizing behavior problems (higher values indicate more problems). Including these controls in the model does not affect the pattern of results or the magnitude of the significant coefficients, so they are excluded from the analyses presented here.

Given the persistence of the negative interaction between fall kindergarten SES and *Educational Engagement*, I estimate additional models interacting *Educational Engagement* with each of the separate components that the ECLS-K used to create the SES composite. These

components include family income, parental educational attainment, and parental occupational prestige, collected in the fall of kindergarten. All of the interactions between the individual SES components and *Educational Engagement* display the same negative interaction as the composite SES measure, suggesting that no single component is driving this relationship. As a result, I continue use the SES composite measure in the analyses presented here.

Because the results of these various supplementary models confirm the results presented below, I show only the results from the primary models described above.

IV. RESULTS

Prevalence of Parenting Dimensions by SES

To address the first question -- does the prevalence of the reported use of each parenting dimension vary by SES -- Figure 1 plots the distributions of each mean-centered parenting practice by SES quartile using box and whiskers plots. The white line in the center of each box shows the median usage level for the given SES quartile. The top and bottom of the boxes bound the interquartile range, and the whisker lines contain the 95th percentiles. The additional dots show outliers that extend beyond the 95 percent range.¹² The y-axis in this plot is reported in standard deviation units.

[Insert Figure 1 about here]

F-tests show statistically significant SES divisions in the prevalence of each type of parenting with lower-SES parents reporting less intense usage of each of the three parenting dimensions than higher-SES parents. However, the SES gradient is much more pronounced for *Educational Engagement* than for the other dimensions, with differences of over one standard deviation of usage on average between parents from the bottom SES quartile and those from the top quartile. Nevertheless, Figure 1 shows that there is considerable overlap in the parenting

practices of parents across SES levels, but that there are differences in the intensity with which they are used.

Examining the Relationship between Parenting and Achievement by SES

To address the second question, I examine whether the relationship between kindergarten parenting and student achievement growth varies by SES using OLS regression. The dependent variables in these models are first, third, fifth, and eighth grade IRT scores in math and reading. The independent variables of interest are the three dimensions of parenting identified from exploratory factor analysis, all of which are entered into the models simultaneously, and SES. As a result, the tables present the coefficients only for the dimensions of parenting, SES, and the interaction of SES and parenting, and indicate the inclusion of other controls in each model. As results are very consistent across grade levels, results for regression models predicting first grade math and reading achievement are presented in Tables 2 and 3. Subsequent tables report the results from the key model from Tables 2 and 3 for all grade levels.

[Insert Tables 2 & 3 about here]

Table 2 presents the relationship between kindergarten parenting and first grade math. In the first model, in column 1, I regress the three parenting measures on first grade math, without controlling for kindergarten test scores or demographic controls and without kindergarten classroom fixed effects. As a result, the first model considers all three dimensions simultaneously, and shows that *Educational Engagement* is the only dimension with a statistically significant relationship with first grade math achievement when the other parenting behaviors are held constant. As shown in column 1, a one standard deviation increase in *Educational Engagement* is associated with a highly significant .256 standard deviation increase in first grade math scores. There is no significant association between *Stimulating Parent-Child*

Interaction and first grade math, and the relationship between *Discursive Discipline* and first grade math is only marginally significant.

The second model introduces my control variables: kindergarten SES, demographic, and test score variables and kindergarten classroom fixed effects. The coefficients from these models should be interpreted as changes in math test scores from kindergarten until first grade, among children within the same classroom. Column 2 reveals that the positive association between *Educational Engagement* and math is greatly reduced, as the coefficient is much smaller and only marginally significant once SES and demographic and test score controls are added to the models.¹³ These results are consistent with Cheadle and Amato (2011)'s findings about the close relationship between SES and their measure of concerted cultivation. One unexpected finding is that the relationship between *Stimulating Parent-Child Interaction* and achievement is negative and significant, however supplemental models confirm that this is only because the other parenting behaviors are in the model.

The final three models include an interaction between each dimension of parenting and parental SES to examine whether the relationship between SES and each dimension varies by SES. Column 3 shows that the association between *Educational Engagement* and math gains varies by SES, controlling for kindergarten demographics, achievement, classroom, and other parenting behaviors. The significant coefficient for the interaction between *Educational Engagement* and SES is -.025. Thus, moving from one standard deviation below the mean to one standard deviation above the mean on *Educational Engagement* is associated with an increase in first grade math achievement gains of .092 standard deviations for lower-SES children, but little change for higher-SES children. These relationships are illustrated in Figure 2, which graphs the expected gains in student achievement associated with *Educational Engagement* for students

with who have low, average, and high levels of SES (plotted using the coefficients from Table 2 column 3, with SES and *Educational Engagement* centered on a mean of zero and a standard deviation of 1). The plots in the figure show a convergence of test score gains across SES levels as usage of *Educational Engagement* increases, which extends to the point where their respective math achievement gains are less than .032 standard deviations apart at plus-one standard deviation levels of *Educational Engagement*. This suggests that the achievement gains associated with *Educational Engagement* are greatest for low-SES students.¹⁴¹⁵ There are no differences in gains related to *Stimulating Parent-Child Interaction* or *Discursive Discipline* by SES.

[Insert Figure 2 about here]

Table 3 presents the analogous relationship for first grade reading and the layout of the table mirrors that of Table 2. As with math, *Educational Engagement* is positively associated with SES for reading. Once controls for SES, baseline test scores, and demographic characteristics are added, the positive association between *Educational Engagement* and first grade reading is greatly reduced, and not significant. The negative interaction between *Educational Engagement* and SES again demonstrates that *Educational Engagement* is associated with smaller SES differences in achievement changes in reading between kindergarten and first grade with a coefficient of -.022. There are no significant interactions between *Stimulating Parent-Child Interaction* or *Discursive Discipline* and SES.

To examine whether early parenting has long-lasting effects (Maccoby 2000), models examining the relationship between kindergarten parenting and third, fifth, and eighth grade reading and math reveal somewhat similar patterns to the relationship between parenting and first grade math and reading.¹⁶ These results are shown in the first four columns of Tables 4 & 5.

[Insert Tables 4 & 5 about here]

In each grade, there is a significant, negative interaction between *Educational Engagement* and SES for math and reading. The associations decline somewhat in size in third grade, but then increase in magnitude in fifth and eighth grades for math. The associations for reading grow from first through fifth and decline somewhat in eighth grade, but remain significant. In addition, in eighth grade for math, but in no other grade, there is a significant and negative interaction with *Stimulating Parent-Child Interaction* and SES as well (not shown). Thus, kindergarten parenting, and particularly *Educational Engagement*, is associated with achievement in every grade, through eighth grade and is associated with smaller achievement gaps in both math and reading.

In supplementary models for grades 3 through 8 only, I estimate identical models with science IRT scores as the dependent variable. In each of these analyses, there is a significant, negative interaction between *Educational Engagement* and SES for science. There is no significant relationship between SES and the other two parenting dimensions, with the exception of *Discursive Discipline* at grade 5, in which the interaction is also negative. This suggests that the relationships highlighted here are not unique to reading and math achievement, but hold for academic achievement more broadly.

Finally, I examine one possible mechanism that might account for SES variation in the relationship between parenting and achievement. Drawing on Morgan et al.'s (2011) compensatory hypothesis, I consider whether *Educational Engagement* might be more effective for low-SES students because it is more effective for low-achieving students. To examine this potential explanation for the interaction between SES and *Educational Engagement*, Tables 4 and 5 also introduce interactions between prior achievement and *Educational Engagement* in columns 5-8. These columns show models which include interactions between *Educational*

Engagement and SES and *Educational Engagement* and fall kindergarten achievement in the same domain as the later achievement outcome (i.e. for math outcomes, *Educational Engagement* is interacted with kindergarten math).

For math achievement, introducing the interaction between *Educational Engagement* and prior achievement into the model completely accounts for the interaction between *Educational Engagement* and SES in every grade level. This indicates that the relationship between *Educational Engagement* and SES, which showed the largest achievement gains for low-SES students, is due to the compensatory relationship between *Educational Engagement* and math achievement in kindergarten. For example, in first grade math, the negative and significant interaction between *Educational Engagement* and SES from Table 4, column 1 (also shown in Table 2 column 3) is reduced to nearly zero once the interaction between *Educational Engagement* and kindergarten math achievement is added to the model (see Table 4, column 5). Instead, the interaction of math and *Educational Engagement* interaction is significant, with a coefficient of $-.069$.

Likewise, for reading, the pattern is mostly the same, with one exception. The significant interaction between *Educational Engagement* and SES is no longer significant after accounting for the differential relationship between *Educational Engagement* and kindergarten achievement, in all grades except first. In first grade reading, the differential relationship between *Educational Engagement* and kindergarten achievement accounts for about a third of the interaction effect between *Educational Engagement* and SES, and the negative and significant interaction between *Educational Engagement* and SES of $-.022$ from Table 5 column 1 (also Table 3 column 3) is reduced to $-.014$ (see Table 5, column 5). However, the interaction of *Educational Engagement* and kindergarten reading is also significant, with a coefficient of $-.026$, suggesting that

Educational Engagement is more beneficial for reading achievement growth for both low-SES and low-achieving kindergarten readers than for those who are higher-SES and higher-achieving. In third through eighth grade, reading follows the same pattern as math, where the interaction between *Educational Engagement* and SES is completely explained by the interaction between *Educational Engagement* and kindergarten reading achievement. This suggests that the differential payoff to *Educational Engagement* for low SES students is largely due to its impact on low-achieving students, in all grades for math and in all but first grade for reading.¹⁷

V. DISCUSSION

This study builds on previous work linking parenting and inequality by examining 1) whether there are commonalities in the types of parenting practices used by parents of different SES levels, and 2) whether there is variation in the relationship between these parenting practices and student achievement across SES. Using the largest nationally-representative dataset available, I examine a host of parenting practices and behaviors to identify three different dimensions of parenting, noting that while there are SES differences in the degree to which these are utilized, there are substantial commonalities across SES. I then show that parenting behaviors are associated with the largest achievement gains among low-SES students and no gain for high-SES students.

I begin by using exploratory factor analysis to identify three dimensions of parenting: *Educational Engagement*, *Stimulating Parent-Child Interaction*, and *Discursive Discipline*. While the first dimension resembles many parts of Lareau's concerted cultivation, the other two dimensions also contain important aspects of this theoretical construct of parenting. Examining these dimensions separately rather than as a unified construct allows for an investigation of variation in their usage at school entry across class. I find that usage of all three of the

dimensions varies across SES background, but that each one is used by parents of all SES levels to some degree. However, the magnitude of the differences varies by type of parenting behavior. While the pervasiveness of each of the three parenting dimensions varies significantly by SES, these behaviors are practiced by parents across the SES spectrum. Although *Educational Engagement* has the largest SES differences in level of usage, the SES differences observed are not as distinct as some previous researchers have suggested. While it may be the case that lower-SES parents use some behaviors more closely associated with the accomplishment of natural growth logic of parenting identified by Lareau (2011), from the questions included in this survey and from the relationships between the factors I identify, some lower-SES parents do use behaviors consistent with concerted cultivation in moderate, and even high, amounts. Thus, my findings suggest that parenting behaviors cross SES boundaries somewhat fluidly and are not starkly distinct across groups. These results temper Lareau's conclusions that, "family practices cohere by class," (263, 2003) and instead support Amato and Fowler's (2002) conclusions that there exists a common group of parenting practices across SES groups.

Examining the relationship between the three dimensions and achievement simultaneously allows me to identify which parts of concerted cultivation seem most related to later student performance. Of the three dimensions, *Educational Engagement* seems to have particularly important implications for student academic performance over a child's development from middle childhood to adolescence. As with Roksa and Potter's (2011) findings, these analyses do not present a causal relationship between social background and parenting, but instead they confirm the presence of variation in the relationship between parenting practices and student achievement. Extending beyond the work of Roksa and Potter, I find that the differential relationship between *Educational Engagement* and SES, which suggests larger achievement

gains for lower-SES children than for higher-SES children, occurs in both in the short and long term. These findings are at odds with Cheadle's (2009) conclusions that the effects of home environment do not persist beyond school entry. The results speak to theoretical arguments and empirical findings about the social reproduction of class through parenting. Initial results highlight that parenting, particularly in the form of *Educational Engagement*, helps to buffer lower-SES children from falling as far behind their higher-SES peers, suggesting some form of cultural mobility (DiMaggio 1982), in which the signals of class are best utilized by lower-SES children to make gains relative to higher-SES children. These results also echo the findings of several other studies that show that disadvantaged children benefit most from good parenting practices focused on supporting academic success (Crosnoe et al. 2010; De Graaf et al. 2000; Domina 2005).¹⁸

To identify one possible mechanism for this relationship, I examine whether parenting interacts with prior achievement in addition to SES. This allows me to see whether *Educational Engagement* is especially beneficial to low-SES children because it is especially beneficial to low-achieving children, as we might expect given Morgan et al.'s (2011) compensatory hypothesis. I examine this by including an interaction between *Educational Engagement* and prior achievement in addition to an interaction between *Educational Engagement* by SES. Given that including achievement interaction completely accounts for the SES interaction, I conclude that low-SES children benefit from *Educational Engagement* because it is especially beneficial to low-achieving children. While *Educational Engagement* levels are typically lower among low-SES parents, these results are policy-relevant, as they suggest that low-achieving students, many of whom have low-SES parents, stand to benefit from interventions encouraging parents to engage in these practices.

These results emphasize that parenting, and especially *Educational Engagement*, may counteract some of the social reproduction of SES hierarchies. In contrast to Bourdieu's (2000) notions that parenting confers markers of class onto upper-class students and does not work for lower-class students, here, parenting has the opposite relationship with achievement. It also operates in a functional rather than symbolic way. Lower-SES children do in fact benefit when their parents adopt practices that resembling Lareau's notion of concerted cultivation, and they benefit more from these practices because *Concerned Cultivation* is especially beneficial for low-achieving students. The results also provide a clear pattern of *Educational Engagement* parenting as a potential vehicle for closing SES achievement gaps. The results also confirm Roksa and Potter's (2011) findings that the differential benefits of parenting depend on the specific types of parenting behaviors, as *Educational Engagement*, and to a limited extent *Stimulating Parent-Child Interaction*, but not *Discursive Discipline* have a differential relationship with achievement by SES. The absence of this relationship with *Discursive Discipline* suggests that there is no additional positive effect of these types of positive and supportive disciplinary behaviors.¹⁹

These results also have important implications when considering how to target investment in parenting-focused interventions. The pattern of results observed here suggests that parenting interventions should focus on promoting parental engagement with schools, increasing academic resources in the home, and providing extracurricular experiences for children, rather than focusing on discipline or parent-child interactions focused on skills development. Future work should consider incorporating these types of parenting interventions into random-assignment studies to test the efficacy of increasing the behaviors identified here for improving student performance.

Despite the potential for parenting behaviors to influence student performance in the long term, the magnitude of the relationship between low-income children's achievement and these parenting practices is in some sense small. The models presented here control for the wide SES differences in achievement present at kindergarten entry which are shown in Table 1 and focus on the differences in achievement change that occurs between kindergarten and eighth grades. The gaps between children in the interquartile range of SES are large, at nearly one standard deviation in reading and over one standard deviation in math in the fall of kindergarten. Relative to these large gaps, the differential associations between parenting and achievement growth presented in Tables 2 through 5 are quite modest. These estimates represent the changes from kindergarten on after accounting for kindergarten demographic characteristics, including SES, and kindergarten classroom. In other words, *Educational Engagement* is not sufficient to eliminate test score gaps overall or at school entry, but it does help to restrain the unequal growth in achievement across SES groups during elementary and middle school.

The findings also highlight several additional limitations, both in the approach of the present study and in the ability of parenting practices to help address the socio-economic achievement gap. The present study takes advantage of nationally representative, longitudinal data to examine parenting, as such, it does not identify causal linkages between parenting, SES, and achievement. Nonetheless, this work is highly suggestive of a differential association between *Educational Engagement* and achievement growth by SES over the course of development, and draws on a large body of literature supporting this conclusion. Thus, the findings of an association between parenting and achievement growth, that is beneficial for lower-SES children and minimal for higher-SES children, should be taken seriously. Further, this

work reaffirms conclusions from experimental work finding that disadvantaged students benefit more from interventions targeting the home environment (Burchinal et al. 1997).

In sum, this study examines SES differences in the prevalence of parenting practices, whether the association between parenting and academic achievement growth differs by SES, and whether this relationship persists from elementary school through adolescence. Using the ECLS-K, this study identifies three underlying dimensions of parenting from a host of kindergarten parenting behaviors and practices. All three dimensions are used most frequently, but not exclusively, by high SES parents. Of the three, *Educational Engagement* is consistently associated with a smaller gap in achievement growth for reading and math at every grade level, and is particularly influential for students entering kindergarten with low math and reading skills, consistent with a compensatory hypothesis (Morgan et al. 2011). In contrast, *Stimulating Parent-Child Interaction* only differentially impacts achievement by SES in eighth grade math and *Discursive Discipline* is not associated with differential impacts on achievement at any grade. Together, these results suggest that parenting, and in particular *Educational Engagement*, is not purely a vehicle for reproducing class advantage, but that it can help to reduce SES differences in achievement as well.

REFERENCES

- Amato, P. R., and F. Fowler. 2002. "Parenting practices, child adjustment, and family diversity." *Journal of Marriage and Family* 64(3):703-716.
- Becker, G. S. 1964. *Human capital: A theoretical and empirical analysis, with special reference to education*. New York: National Bureau of Economic Research; distributed by Columbia University Press.
- Becker, G. S. 1993. *Human capital*. The University of Chicago Press.
- Bodovski, K., and G. Farkas. 2008. "'Concerted cultivation' and unequal achievement in elementary school." *Social Science Research* 37(3):903.
- Bodovski, K., and M. J. Youn. 2010. "Love, discipline and elementary school achievement: The role of family emotional climate." *Social Science Research* 39(4):585-595.
- Bourdieu, P. 1986. "The forms of social capital." Pp. 241-258 in *Handbook of Theory and Research for the Sociology of Education*. New York: Greenwood Press.
- Bourdieu, P. 2000. "Cultural Reproduction and Social Reproduction." Pp. 56-68 in *The Structure of Schooling: Readings in the Sociology of Education*. R. Arum and I. Beattie (Eds.). Thousand Oaks, CD: Pine Forde Press.
- Bourdieu, P., and J. C. Passeron. 1990. *Reproduction in education, society, and culture*. Sage Publications Ltd.
- Bowles, S., and H. Gintis. 1976. *Schooling in capitalist America: Educational reform and the contradictions of economic life*. New York: Basic Books.
- Bradley, R. H., B. M. Caldwell, and S. L. Rock. 1988. "Home environment and school performance: A ten-year follow-up and examination of three models of environmental action." *Child Development* 59(4):852-867.
- Brooks-Gunn, J., P. K. Klebanov, and G. J. Duncan. 1996. "Ethnic differences in children's intelligence test scores: Role of economic deprivation, home environment, and maternal characteristics." *Child Development* 67(2):396-408.
- Burchinal, M. R., F. A. Campbell, D. M. Brayant, B. H. Wasik, and C. T. Ramey. 1997. "Early intervention and mediating processes in cognitive performance of children of low income African American families." *Child Development* 68(5):935-954.
- Burchinal, M. R., J. E. Roberts, S. A. Zeisel, E. A. Hennon, and S. Hooper. 2006. "Social risk and protective child, parenting, and child care factors in early elementary school years." *Parenting* 6(1):79-113.
- Caldwell, B. M., & Bradley, R. H. (2003). *Home Observation for Measurement of the Environment: Administration Manual*. Tempe, AZ: Family & Human Dynamics Research Institute, Arizona State University.
- Cheadle, J. E. 2006. "The role of 'concerted cultivation' in childhood academic achievement growth processes: Class and race differences from kindergarten through third grade." Dissertation. The Pennsylvania State University.
- Cheadle, J. E. 2008. "Educational investment, family context, and children's math and reading growth from kindergarten through the third grade." *Sociology of Education* 81(1):1.
- Cheadle, J. E. 2009. "Parent educational investment and children's general knowledge development." *Social Science Research* 38(2):477-491.

- Cheadle, J. E., and P. R. Amato. 2011. "A Quantitative Assessment of Lareau's Qualitative Conclusions About Class, Race, and Parenting." *Journal of Family Issues* 32(5):679.
- Chin, T., and M. Phillips. 2004. "Social reproduction and child-rearing practices: Social class, children's agency, and the summer activity gap." *Sociology of Education* 77(3):185.
- Coleman, J. S. 1988. "Social capital in the creation of human capital." *The American Journal of Sociology* 94(1):95-120.
- Coleman, J. S. et al. 1966. *Equal educational opportunity*. Washington D.C.: U.S. Dept. of Health, Education, and Welfare, Office of Education.
- Crosnoe, R., T. Leventhal, R. J. Wirth, K. M. Pierce, and R. C. Pianta. 2010. "Family socioeconomic status and consistent environmental stimulation in early childhood." *Child Development* 81(3):972-987.
- Cunha, F., J. J. Heckman, L. Lochner, and D. V. Masterov. 2006. "Interpreting the evidence on life cycle skill formation." *Handbook of the Economics of Education* 1:697-812.
- De Graaf, N. D., P. M. De Graaf, and G. Kraaykamp. 2000. "Parental cultural capital and educational attainment in the Netherlands: A refinement of the cultural capital perspective." *Sociology of Education* 73(2):92-111.
- Desimone, L. 1999. "Linking parent involvement with student achievement: Do race and income matter?" *The Journal of Educational Research* 93(1):11-30.
- DiMaggio, P. 1982. "Cultural capital and school success: The impact of status culture participation on the grades of US high school students." *American Sociological Review* 47(2):189-201.
- DiMaggio, P., and J. Mohr. 1985. "Cultural capital, educational attainment, and marital selection." *American Journal of Sociology* 90(6):1231-1261.
- Dodici, B. J., D. C. Draper, and C. A. Peterson. 2003. "Early parent-child interactions and early literacy development." *Topics in Early Childhood Special Education* 23(3):124.
- Domina, T. 2005. "Leveling the home advantage: Assessing the effectiveness of parental involvement in elementary school." *Sociology of Education* 78(3):233.
- Dornbusch, S. M., P. L. Ritter, P. H. Leiderman, D. F. Roberts, and M. J. Fraleigh. 1987. "The relation of parenting style to adolescent school performance." *Child Development* 58(5):1244-1257.
- Dumais, S. A. 2002. "Cultural capital, gender, and school success: The role of habitus." *Sociology of Education* 75(1):44-68.
- Duncan, G. J., and K. A. Magnuson. 2005. "Can family socioeconomic resources account for racial and ethnic test score gaps?" *The Future of Children* 15(1):35-54.
- Duncan, G. J., J. Brooks-Gunn, and P. K. Klebanov. 1994. "Economic deprivation and early childhood development." *Child Development* 65(2):296-318.
- Duncan, G. J., W. J. Yeung, J. Brooks-Gunn, and J. R. Smith. 1998. "How much does childhood poverty affect the life chances of children?" *American Sociological Review* 63(3):406-423.
- Epstein, J. L. 1987. "Toward a theory of family-school connections: Teacher practices and parent involvement." Pp. 121-136 in *Social Intervention: Potential and constraints, prevention and intervention in childhood and adolescence*. Oxford, England: Walter de Gruyter.
- Estrada, P., W. F. Arsenio, R. D. Hess, and S. D. Holloway. 1987. "Affective quality of the mother-child relationship: Longitudinal consequences for children's school-relevant cognitive functioning." *Developmental Psychology* 23(2):210.

- Farkas, G. 2003. "Cognitive skills and noncognitive traits and behaviors in stratification processes." *Annual Review of Sociology* 29:541-562.
- Farkas, G., and K. Beron. 2004. "The detailed age trajectory of oral vocabulary knowledge: differences by class and race." *Social Science Research* 33(3):464-497.
- Farkas, G., R. P. Grobe, D. Sheehan, and Y. Shuan. 1990. "Cultural Resources and School Success: Gender, Ethnicity, and Poverty Groups within an Urban School District." *American Sociological Review* 55:127-142.
- Floyd, F. J., and K. F. Widaman. 1995. "Factor analysis in the development and refinement of clinical assessment instruments." *Psychological Assessment* 7(3):286.
- Fryer, R. G., and S. D. Levitt. 2004. "Understanding the Black-White test score gap in the first two years of school." *The Review of Economics and Statistics* 86(2):447-464.
- Giles-Sims, J., M. A. Straus, and D. B. Sugarman. 1995. "Child, maternal, and family characteristics associated with spanking." *Family Relations* 44(2):170-176.
- Hart, B., and T. R. Risley. 1995. *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Brookes Publishing Company.
- Heath, S. B. 1983. *Ways with words: Language, life, and work in communities and classrooms*. Cambridge University Press.
- Heckman, J. J. and D. V. Masterov. 2007. "The productivity argument for investing in young children." *Review of Agricultural Economics* 29(3): 446-493.
- Kohn, M. L. 1989. *Class and conformity: A study in values*. University of Chicago Press. Second Edition.
- Landry, S. H., K. E. Smith, P. R. Swank, and C. L. Miller Loncar. 2000. "Early maternal and child influences on children's later independent cognitive and social functioning." *Child Development* 71(2):358-375.
- Lansford, J. E., K. Deater-Deckard, K. A. Dodge, J. E. Bates, and G. S. Pettit. 2004. "Ethnic differences in the link between physical discipline and later adolescent externalizing behaviors." *Journal of Child Psychology and Psychiatry, and Allied Disciplines* 45(4):801.
- Lareau, A. 1989. "Family-school relationships: A view from the classroom." *Educational Policy* 3(3):245.
- Lareau, A. 2000. *Home advantage: Social class and parental intervention in elementary education*. Lanham, MD: Rowman & Littlefield Publishers Inc.
- Lareau, A. 2011. *Unequal Childhoods: Class, race, and family life, with an update a decade later*. University of California Press. Second Edition.
- Lareau, A., and E. M. N. Horvat. 1999. "Moments of social inclusion and exclusion race, class, and cultural capital in family-school relationships." *Sociology of Education* 72(1):37-53.
- Lareau, A., and E. B. Weininger. 2003. "Cultural capital in educational research: A critical assessment." *Theory and Society* 32:567-606.
- Maccoby, E. 2000. "Parenting and its effects on children: on reading and misreading behavior genetics." *Annual Review of Psychology* 51:1-12.
- McDonough, P. M. 1997. *Choosing colleges: How social class and schools structure opportunity*. Albany, NY: SUNY Press.

- McNeal, R. B. 1999. "Parental involvement as social capital: Differential effectiveness on science achievement, truancy, and dropping out." *Social Forces* 78(1):117-144.
- McNeal, R. B. 2001. "Differential effects of parental involvement on cognitive and behavioral outcomes by socioeconomic status." *Journal of Socio-Economics* 30(2):171-179.
- Morgan, P. L., G. Farkas, and Q. Wu. 2011. "Kindergarten children's growth trajectories in reading and mathematics." *Journal of Learning Disabilities* 44(5):472-488.
- Ono, H., and H. J. Tsai. 2008. "Race, parental socioeconomic status, and computer use time outside of school among young American children, 1997 to 2003." *Journal of Family Issues* 29(12):1650.
- Phillips, M. 2011. "Parenting, time use, and disparities in academic outcomes." Pp. 207-228 in *Whither opportunity: Rising inequality, schools, and children's life chances*. G. J. Duncan and R. J. Murnane (Eds.). New York, N.Y.: Russell Sage Foundation.
- Reardon, S. F. 2011. "The widening academic achievement gap between the rich and the poor: New evidence and possible explanations." Pp. 91-116 in *Whither opportunity: Rising inequality, schools, and children's life chances*. G. J. Duncan and R. J. Murnane (Eds.). New York, N.Y.: Russell Sage Foundation Publications.
- Roksa, J., and D. Potter. 2011. "Parenting and academic achievement." *Sociology of Education* 84(4):299-321.
- Roscigno, V. J., and J. W. Ainsworth-Darnell. 1999. "Race, cultural capital, and educational resources: Persistent inequalities and achievement returns." *Sociology of Education* 72(3):158-178.
- Sirin, S. R. 2005. "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research." *Review of Educational Research* 75(3):417-453.
- Steinberg, L., S. D. Lamborn, S. M. Dornbusch, and N. Darling. 1992. "Impact of parenting practices on adolescent achievement: Authoritative parenting, school involvement, and encouragement to succeed." *Child Development* 63(5):1266-1281.
- Sui-Chu, E. H., and J. D. Willms. 1996. "Effects of parental involvement on eighth-grade achievement." *Sociology of Education* 69(2):126-141.
- White, K. R. 1982. "The relation between socioeconomic status and academic achievement." *Psychological Bulletin* 91(3):461.

Table 1. *Weighted Sample Means and Standard Deviations for the Total Regression-Based Sample and by SES*

	SES Lowest 25%	SES Middle 50%	SES Highest 25%	P-value for differences across SES	Full Sample
Achievement Outcomes & Baseline Achievement Controls (standardized)					
Reading IRT Spring 8 th	-0.629 (0.985)	0.042 (0.907)	0.621 (0.760)	<.001	0.000 (1.000)
Math IRT Spring 8 th	-0.582 (0.995)	0.031 (0.913)	0.594 (0.790)	<.001	0.000 (1.000)
Reading IRT Spring 1 st	-0.507 (0.822)	0.019 (0.916)	0.540 (1.061)	<.001	0.000 (1.000)
Math IRT Spring 1 st	-0.522 (0.840)	0.018 (0.921)	0.558 (1.017)	<.001	0.000 (1.000)
Reading IRT Fall K	-0.491 (0.692)	-0.003 (0.873)	0.568 (1.227)	<.001	0.000 (1.000)
Math IRT Fall K	-0.557 (0.692)	0.002 (0.874)	0.630 (1.161)	<.001	0.000 (1.000)
General Knowledge Fall K	-0.640 (0.823)	0.040 (0.894)	0.646 (0.950)	<.001	0.000 (1.000)
Control Variables from Fall of Kindergarten (standardized)					
SES (standardized)	-1.098	-0.054	1.369	<.001	0.000
Female	0.492	0.483	0.492	.854	0.488
White	0.348	0.648	0.798	<.001	0.603
Black	0.236	0.139	0.059	<.001	0.146
Hispanic	0.341	0.140	0.066	<.001	0.177
Asian	0.019	0.023	0.041	.007	0.026
Other race	0.057	0.050	0.034	.004	0.048
Age (in years)	5.693	5.715	5.707	.004	5.707
First time kindergartener	0.940	0.960	0.971	<.001	0.957
Two biological parent family	0.421	0.702	0.863	<.001	0.691
Single parent family	0.336	0.182	0.098	<.001	0.204
Other family type	0.143	0.117	0.039	<.001	0.105
Mom 30 or above at first birth	0.040	0.126	0.355	<.001	0.157
Mom a teen at first birth	0.499	0.235	0.041	<.001	0.260
Mom or child got WIC	0.830	0.441	0.103	<.001	0.466
Birth weight (in pounds)	7.212	7.418	7.544	<.001	7.392
Observations					12887

Means; SD in parentheses; Uses Parent Panel Weight Full Sample (BYPW0)

Table 2. *Regression Models Estimating First Grade Math Achievement with Kindergarten Parenting and SES*

	(1) Parenting Measures	(2) Plus SES, Test & Demographic Controls	(3) <i>Educational Engagement X SES</i>	(4) <i>Stimulating Parent-Child Interaction X SES</i>	(5) <i>Discursive Discipline X SES</i>
<i>Educational Engagement</i>	0.256*** (0.022)	0.022+ (0.012)	0.021+ (0.011)	0.022+ (0.012)	0.022+ (0.012)
<i>Stimulating Parent- Child Interaction</i>	-0.000 (0.008)	-0.018* (0.008)	-0.019* (0.008)	-0.019* (0.008)	-0.018* (0.008)
<i>Discursive Discipline</i>	0.014+ (0.007)	-0.003 (0.006)	-0.004 (0.006)	-0.003 (0.006)	-0.003 (0.006)
Fall K SES		0.040*** (0.007)	0.041*** (0.006)	0.041*** (0.007)	0.040*** (0.006)
<i>Educational Engagement X SES</i>			-0.025*** (0.006)		
<i>Stimulating Parent- Child Interaction X SES</i>				-0.004 (0.005)	
<i>Discursive Discipline X SES</i>					-0.002 (0.007)
Fall K Test & Demographic Controls		X	X	X	X
Fall K Classroom Fixed Effects		X	X	X	X
Constant	0.007 (0.004)	0.006 (0.004)	0.005 (0.004)	0.006 (0.004)	0.006 (0.004)
Observations	12887	12887	12887	12887	12887
R ² (min, max)	(.048, .051)	(.480, .497)	(.480, .497)	(.480, .497)	(.480, .497)

Standard errors in parentheses; R² (min, max) from 10 imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Models use Parent Panel Weight for the Full Sample (C124PW0) and corresponding PSUs (C124PPSU). Standardized parenting dimensions and SES are measured in the fall of kindergarten. Models include fall kindergarten demographic controls and IRT scores for reading, math, and general knowledge. Coefficients can thus be interpreted as the change in math achievement from kindergarten to first grade, within classroom, net of demographic characteristics.

Table 3. Regression Models Estimating First Grade Reading Achievement with Kindergarten Parenting and SES

	(1) Parenting Measures	(2) Plus SES, Test & Demographic Controls	(3) <i>Educational Engagement X SES</i>	(4) <i>Stimulating Parent-Child Interaction X SES</i>	(5) <i>Discursive Discipline X SES</i>
<i>Educational Engagement</i>	0.229*** (0.012)	-0.006 (0.013)	-0.007 (0.012)	-0.006 (0.013)	-0.006 (0.013)
<i>Stimulating Parent- Child Interaction</i>	0.008 (0.006)	-0.005 (0.006)	-0.006 (0.006)	-0.005 (0.006)	-0.005 (0.006)
<i>Discursive Discipline</i>	0.001 (0.010)	-0.003 (0.009)	-0.004 (0.009)	-0.004 (0.009)	-0.003 (0.009)
Fall K SES		0.033** (0.011)	0.033** (0.011)	0.033** (0.011)	0.032** (0.011)
<i>Educational Engagement X SES</i>			-0.022*** (0.007)		
<i>Stimulating Parent- Child Interaction X SES</i>				-0.005 (0.009)	
<i>Discursive Discipline X SES</i>					-0.016 (0.011)
Fall K Test & Demographic Controls		X	X	X	X
Fall K Classroom Fixed Effects		X	X	X	X
Constant	0.002 (0.004)	0.004 (0.004)	0.004 (0.004)	0.005 (0.004)	0.004 (0.004)
Observations	12887	12887	12887	12887	12887
R ² (min, max)	(.036, .043)	(.472, .484)	(.473, .485)	(.472, .484)	(.472, .485)

Standard errors in parentheses; R² (min, max) from 10 imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Models use Parent Panel Weight for the Full Sample (C124PW0) and corresponding PSUs (C124PPSU). Standardized parenting dimensions and SES are measured in the fall of kindergarten. Models include fall kindergarten demographic controls and IRT scores for reading, math, and general knowledge. Coefficients can thus be interpreted as the change in reading achievement from kindergarten to first grade, within classroom, net of demographic characteristics.

Table 4. *Educational Engagement X SES & Educational Engagement X Achievement Predicting Math*

	<i>Educational Engagement X Baseline SES</i>				<i>Plus Educational Engagement X Baseline Math</i>			
	(1) 1 st Grade Math	(2) 3 rd Grade Math	(3) 5 th Grade Math	(4) 8 th Grade Math	(5) 1 st Grade Math	(6) 3 rd Grade Math	(7) 5 th Grade Math	(8) 8 th Grade Math
<i>Educational Engagement</i>	0.021 ⁺ (0.012)	0.002 (0.013)	-0.003 (0.019)	-0.022 (0.020)	0.023* (0.011)	0.004 (0.011)	-0.012 (0.018)	-0.024 (0.017)
<i>Stimulating Parent-Child Interaction</i>	-0.019* (0.008)	-0.022*** (0.007)	-0.012 (0.015)	0.016 (0.016)	-0.020* (0.008)	-0.025*** (0.007)	-0.011 (0.016)	0.011 (0.013)
<i>Discursive Discipline</i>	-0.004 (0.006)	-0.018 ⁺ (0.007)	-0.007 (0.015)	-0.000 (0.020)	-0.005 (0.006)	-0.013 (0.008)	-0.009 (0.014)	0.000 (0.019)
Fall K SES	0.041*** (0.006)	0.060*** (0.014)	0.078*** (0.018)	0.098*** (0.022)	0.041*** (0.007)	0.066*** (0.010)	0.082*** (0.016)	0.102*** (0.019)
Fall K Math	0.556*** (0.013)	0.523*** (0.014)	0.459*** (0.023)	0.397*** (0.021)	0.581*** (0.010)	0.558*** (0.011)	0.495*** (0.024)	0.438*** (0.021)
<i>Educational Engagement X SES</i>	-0.025*** (0.006)	-0.020** (0.008)	-0.028** (0.009)	-0.040*** (0.010)	0.002 (0.006)	0.011 (0.011)	0.005 (0.013)	-0.005 (0.011)
<i>Educational Engagement X Math</i>					-0.069*** (0.007)	-0.096*** (0.012)	-0.115*** (0.018)	-0.120*** (0.016)
Constant	0.005 (0.004)	0.007 (0.007)	0.011 (0.011)	0.029* (0.012)	0.006 (0.004)	0.006 (0.008)	0.004 (0.012)	0.020 (0.012)
Observations	12887	10603	8091	6636	12887	10603	8091	6636
R ² (min, max)	(.480, .497)	(.452, .462)	(.403, .417)	(.319, .326)	(.484, .504)	(.460, .472)	(.418, .432)	(.333, .342)

Standard errors in parentheses. R² (min, max) from 10 imputations. Includes controls for gender, age, race/ethnicity, if the child is a first time kindergartener, family type, age of mom's first childbirth, if the mom or child received WIC, the child's birth weight, and fall kindergarten test scores. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. *Educational Engagement X SES & Educational Engagement X Achievement Predicting Reading*

	<i>Educational Engagement X Baseline SES</i>				<i>Plus Educational Engagement X Baseline Math</i>			
	(1) 1 st Grade Math	(2) 3 rd Grade Math	(3) 5 th Grade Math	(4) 8 th Grade Math	(5) 1 st Grade Math	(6) 3 rd Grade Math	(7) 5 th Grade Math	(8) 8 th Grade Math
<i>Educational Engagement</i>	-0.007 (0.012)	0.001 (0.014)	0.002 (0.016)	-0.008 (0.017)	-0.007 (0.010)	0.007 (0.012)	-0.002 (0.018)	-0.001 (0.017)
<i>Stimulating Parent-Child Interaction</i>	-0.006 (0.006)	-0.016 ⁺ (0.008)	-0.016 (0.018)	-0.017 (0.022)	-0.009 ⁺ (0.005)	-0.021* (0.010)	-0.021 (0.017)	-0.026 (0.020)
<i>Discursive Discipline</i>	-0.004 (0.014)	-0.016 ⁺ (0.009)	-0.016 (0.012)	-0.019 ⁺ (0.011)	-0.005 (0.011)	-0.015* (0.007)	-0.019 (0.012)	-0.024* (0.010)
Fall K SES	0.033** (0.011)	0.057*** (0.009)	0.094*** (0.017)	0.107*** (0.024)	0.035** (0.012)	0.062*** (0.011)	0.100*** (0.017)	0.102*** (0.025)
Fall K Math	0.401*** (0.012)	0.136*** (0.013)	0.103*** (0.019)	0.060*** (0.016)	0.415*** (0.012)	0.160*** (0.015)	0.135*** (0.017)	0.083*** (0.022)
<i>Educational Engagement X SES</i>	-0.022*** (0.007)	-0.026*** (0.009)	-0.040** (0.014)	-0.024* (0.011)	-0.014* (0.006)	-0.008 (0.008)	-0.017 (0.014)	0.001 (0.010)
<i>Educational Engagement X Math</i>					-0.026*** (0.008)	-0.062*** (0.010)	-0.090*** (0.012)	-0.072*** (0.014)
Constant	0.004 (0.004)	0.006 (0.006)	0.013 (0.012)	0.021 ⁺ (0.011)	0.003 (0.004)	0.003 (0.005)	0.009 (0.012)	0.016 (0.011)
Observations	12887	10603	8091	6636	12887	10603	8091	6636
R ² (min, max)	(.473, .485)	(.432, .442)	(.394, .415)	(.314, .325)	(.473, .486)	(.432, .446)	(.404, .423)	(.321, .332)

Standard errors in parentheses. R² (min, max) from 10 imputations. Includes controls for gender, age, race/ethnicity, if the child is a first time kindergartener, family type, age of mom's first childbirth, if the mom or child received WIC, the child's birth weight, and fall kindergarten test scores. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1. Parenting Dimension Usage, by SES Quartile

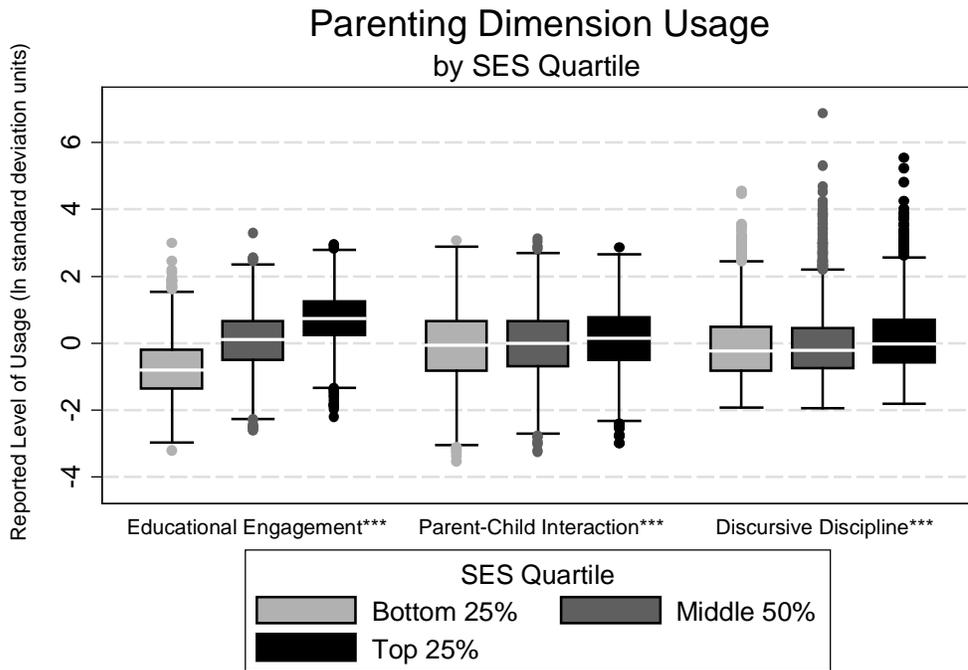


Figure 2. Relationship between *Educational Engagement* and First Grade Math, by SES

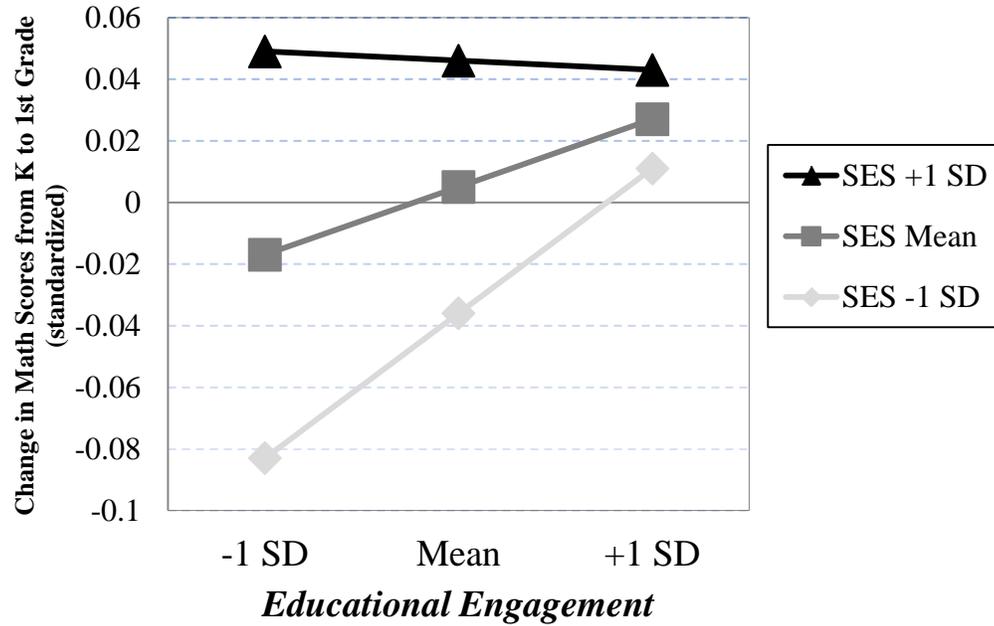


Figure 2 plots regression coefficients from Model 3 of Table 2. SES and *Educational Engagement* are centered on a mean of zero with a standard deviation of one.

Appendix A. Results from Exploratory Factor Analysis

Variable label	Variable description	Proportion of variance explained by factor	Factor loading
<i>Factor 1: Educational Engagement</i>		<i>0.41</i>	
P2ATHLET	Outside of school hours, has the child participated in organized athletic activities?		0.46
P2ATTENB	Since the fall, have you or other adults in your house attended an open house or back to school night?		0.41
P2ATTENS	Since the fall, have you or other adults in your house attended a school or class event?		0.43
P1CHLAUD	How many children's records, audio tapes, and CDs do you have in the home?		0.38
P1CHLBOO	How many children's books do you have in the home?		0.54
P2PCLASS	About how many parents in your child's class do you talk with regularly?		0.38
P2DANCE	Outside of school hours, has the child taken dance lessons?		0.38
P2FUNDRS	Since the fall, have you or other adults in your house acted as a school volunteer?		0.38
P2HOMECEM	Do you have a home computer that the child uses?		0.46
P2VOLUNT	Since the fall, have you or other adults in your house volunteered in your child's class or school?		0.54
<i>Factor 2: Stimulating Parent-Child Interaction</i>		<i>0.36</i>	
P1BUILD	How often do you build blocks with the child?		0.46
P1GAMES	How often do you play games with the child?		0.48
P1HELPAR	How often do you help the child do arts and crafts?		0.41
P1NATURE	How often do you teach the child about nature?		0.43
P1READBO	How often do you read books with the child?		0.38
P1SINGSO	How often do you sing songs with the child?		0.40
P1SPORT	How often do you play sports with the child?		0.42
P1TELLST	How often do you tell stories to the child?		0.49
<i>Factor 3: Discursive Discipline</i>		<i>0.15</i>	
P2HITAPO	If the child got so angry that s/he hit you, what would you do? Make child apologize		0.45

P2HITCHO	If the child got so angry that s/he hit you, what would you do? Make child do some chores	0.40
P2HITPRV	If the child got so angry that s/he hit you, what would you do? Take away a privilege	0.39
P2HITWAR	If the child got so angry that s/he hit you, what would you do? Give child a warning	0.47

Variables that did not have a factor loading of .35 or above on any factor

P1CHORES	How often is the child involved in household chores?
P1CHLPIC	How often did the child look at picture books outside of school?
P2DEPRES	How often during the past week have you felt depressed?
P2SAD	How often during the past week have you felt sad?
P2NUMTV	How many hours per day does your child watch t.v. or videos on weekdays?
P2MUSIC	Outside of school hours, has the child taken music lessons?
P2CLUB	Outside of school hours, has the child participated in organized clubs or recreational programs?
P2ORGANZ	Outside of school hours, has the child participated in organized performing arts programs?
P2ARTCRF	Outside of school hours, has the child participated in art classes or lessons?
P2LIBRAR	In the past month, has anyone in your family visited the library with your child?
P2MUSEUM	In the past month, has anyone in your family visited a museum with your child?
P2ZOO	In the past month, has anyone in your family visited the zoo or aquarium with your child?
P2CONCRT	In the past month, has anyone in your family attended a play, concert, or show with your child?
P2RELIG	How often does someone in your family speak with your child about the family's religious practices and beliefs?
P2ATTENP	Since the fall, have you or other adults in your house attended a PTA/PTO meeting?
P2PARGRP	Since the fall, have you or other adults in your house attended gone to a parent-teacher conference or regularly scheduled meeting with your child's teacher?

P2NOTWEL	Has the school not making you feel welcome make it harder for you to participate at your child's school?
T2REGCON	During this school year, have this child's parents attended regularly scheduled conferences or meetings?
P2EXPRES	I express affection by hugging, holding, or kissing the child
P2WARMCL	The child and I often have warm, close times together
P2HRDWRM	It is hard for me to be warm to my child
P2CHLIKE	My child likes me and wants to be near me
P2TOOBUS	I am usually too busy to play and joke with child
P2SHOWLV	Even when I'm in a bad mood, I show the child a lot of love
P2HITTO	If the child got so angry that s/he hit you, what would you do? Have child take time out
P2HITDIS	If the child got so angry that s/he hit you, what would you do? Discuss what child did wrong
P2HITSPK	If the child got so angry that s/he hit you, what would you do? Would you spank child
P2HITBCK	If the child got so angry that s/he hit you, what would you do? Hit child back
P2HITIGN	If the child got so angry that s/he hit you, what would you do? Ignore it
P2HITFUN	If the child got so angry that s/he hit you, what would you do? Make fun of child
P2HITYEL	If the child got so angry that s/he hit you, what would you do? Yell at child
P2HITOTH	If the child got so angry that s/he hit you, what would you do? Hit something else
P2TVRULE	Are there family rules for which television programs my child can watch?
P2BKTOG	In a typical week, how many days does the family eats breakfast together?
P2EVENG2	In a typical week, how many days does the family eats an evening meal together?

ENDNOTES

¹ I use a combined definition of cultural capital that encompasses both Lareau and Weininger's (2003) familiarity with "high brow" aesthetic culture as well as Farkas et al.'s (1990) definition that focuses on the general skills, habits, and styles that are usually differentially rewarded by teachers. Central to both of these definitions is the role that parenting plays in transmitting this cultural knowledge, regardless of its specific content. Both lenses on cultural capital view parenting as the key vehicle through which cultural capital is transmitted, at least at early ages. Thus, any examination of intentionally supportive parenting behaviors is also an examination of the ways in which and the extent to which parents attempt to transmit their cultural advantages, in the form of capital, on to their children.

² The sample has 10,603 students with non-missing assessment scores in third grade, and in fifth grade the sample has 8,091 students.

³ Analyses run with and without multiple imputation have substantively similar results. The signs, magnitudes, and statistical significance of nearly all of the coefficients are identical with and without multiple imputation.

⁴ Although there is some worry about the measurement error inherent in self-reported behavior (e.g. Phillips 2011), there is still some useful parenting information included here that is worth examining, which has been used by many other researchers in pursuit of similar questions (e.g. Bodovski and Farkas 2008; Cheadle 2008).

⁵ This approach differs from Cheadle and Amato's (2011) confirmatory factor analysis in which they selected variables which they thought most closely identified with Lareau's concerted cultivation construct. The present approach includes a much wider group of parenting variables, not only those thought to comprise concerted cultivation. It uses exploratory factor analysis to

identify the underlying similarities between variables and not relying on presumed similarities between these variables and their loadings on to particular parenting dimensions. It is also important to note that Cheadle and Amato use parenting constructs from both kindergarten and third grade, examining the stability of their measure of concerted cultivation over time, whereas here I use only parenting variables from kindergarten.

⁶ I use the standard Varimax rotation to generate the dimensions of parenting observed in these data. This maximizes the orthogonality between factors and yields factors that limit correlations between parenting dimensions that may actually occur. However, when I create factors using Promax rotation, the same three factors are identified with the same variables loading onto the same parenting dimensions. While the variance explained by each factor is somewhat different, regression results calculated using the alternate Promax factors are substantively similar.

⁷ Floyd and Widaman (1991) suggest that factor loadings from exploratory factor analysis are generally considered to be meaningful when they exceed .30 or .40. Here, I use the average of these two as the cutoff.

⁸ To test the robustness of the loadings, I performed the exploratory factor analysis in two ways. First, I left all of the variables in their original metrics and the second time, I standardized all of the variables prior to conducting the factor analysis. Both methods yielded the same combinations of variables loading onto an equal number of factors, and had nearly identical loadings. Further, regression results using factors from either method follow the same pattern, with coefficients that are nearly identical. As such, the factor loadings generated by the first method which preserves the original metrics for each variable are used in the analyses presented here.

⁹ Despite somewhat different constructs, the Bodovski and Farkas measure of concerted cultivation also demonstrates a similar pattern of results to those described below in supplementary analyses (not shown).

¹⁰ This is important given the conclusions from Sirin (2005), who found that the location of schools was particularly influential in the relationship between SES and academic achievement. Including fixed effects allows me to make comparisons about this relationship among students within the same school, thereby allaying these concerns. Nevertheless, additional models (not shown) that do not include the kindergarten classroom fixed effects find similar results.

¹¹ An alternative strategy would be to use growth models with either a linear or a higher order functional form to evaluate the underlying functional form. My approach is more flexible in that it imposes no functional form to the relationship between the test score outcomes and the parenting behaviors and control variables. Indeed, as shown below, the results do not conform to a linear or quadratic pattern across grade levels.

¹² Correlations between the parenting measures (not shown) indicate that each of the three parenting dimensions shows little relation to the others, as correlations do not exceed 0.12.

¹³ These decreases from columns 1 to 2 are not due to the inclusion of fall kindergarten fixed effects, but are instead primarily a result of the inclusion of fall kindergarten test score controls.

¹⁴ While Figure 2 suggests that there is a small negative effect for high-SES children, supplemental analyses restricting the sample to children from families among the top 25 percent of SES show that the effect of *Educational Engagement* is in fact small and non-significant. Given this, it is important not to over interpret the slight negative slope for the top of the distribution.

¹⁵ A non-linear relationship was tested both through the use of an interaction between *Educational Engagement* and SES squared and through interactions between SES and dummy variables for the top and bottom 25 percent of the distribution. These models (not shown) reveal that the relationship is essentially linear.

¹⁶ While growth models could be used to examine the relationships over time, this approach is more constrained than the approach taken here. Hierarchical linear modeling would merely adjust for the lack of independence, but the fixed effects used here improve upon this because they force all of the variation to be within classroom which effectively controls for factors leading to selection into school.

¹⁷ Science tests were not given in first grade or kindergarten, and thus the analysis with the SES X fall kindergarten science achievement score is not possible.

¹⁸ Given the considerable SES and kindergarten achievement divisions between racial groups in these data, it is also likely that these types of relationships follow similar patterns across racial groups. As this is not the principal relationship of interest, I did not examine this relationship directly. However, future work should examine the robustness of this relationship across racial groups as well.

¹⁹ However, in the case of discipline, perhaps what is important for a child's adequate development is not the presence of *Discursive Discipline*, but instead the lack of harsh disciplinary techniques. Future research should consider examining this contrast.