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CULTURAL CAPITAL AND TEACHER ABILITY RATING

RESEARCH DEPARTMENT OF SOCIAL POLICY AND WELFARE SERVICES

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Abstract:

This paper studies the effect of cultural capital on teachers' ratings of children's oral and math ability. Cultural reproduction theory hypothesises that, holding everything else constant, children who possess cultural capital are more likely to be perceived by teachers as gifted than children who do not possess cultural capital. This paper uses extremely rich longitudinal data that provides a better basis than previous studies for holding 'everything else' constant. In addition to children and parents' cultural capital, I control for children's actual academic ability, physical appearance, health impairments, social behaviour, antenatal influences, and many family background characteristics. My analysis shows, first, that both children and parents' cultural capital have independent effects on teacher ability ratings. Second, for oral ability I find that parents' cultural capital 'protects' children from very low ability ratings and that children's cultural capital is particularly useful for obtaining very high ability ratings.

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Introduction

Pierre Bourdieu's concept of cultural capital (Bourdieu, 1977, 1984, 1986) is often used to explain how, in addition to traditional socioeconomic and family background characteristics, cultural knowledge, traits and behaviours in individuals and families also affect educational outcomes. The impact of cultural capital on various educational outcomes: academic achievement, educational transitions and final educational attainment has been analysed in a large and growing empirical literature (e.g. DiMaggio 1982; de Graaf 1986; Robinson and Garnier 1985; Kalmijn and Kraaykamp 1996; Aschaffenburg and Maas 1997; Crook, 1997; De Graaf, de Graaf and Kraaykamp 2000; Sullivan 2001; Dumais 2002; Georg 2004; van de Werfhorst and Hofstede 2007). Practically all these studies which cover different countries and time periods find that, net of other influences, cultural capital has a substantial effect on academic achievement, educational transitions and final educational attainment.

Most studies analyse the terminal outcome of cultural reproduction theory; i.e. how cultural capital promotes academic achievement and educational attainment. Only few studies analyse the intermediate processes that lead to this outcome: How children convert their cultural capital, transferred to them from their parents, into preferential treatment in the educational system. Cultural reproduction theory argues, holding everything else constant, that children who possess much cultural capital are perceived by teachers as more gifted than children who possess little cultural capital. Thus, teachers' perceptions of children's academic ability depend not only on children's objective ability but also on cultural endowments which are intrinsically different from academic ability. This evaluation bias leads to favourable treatment and higher grades, both of which factors that provide children with comparative advantages in the educational system (DiMaggio 1982; Lamont and Lareau 1988; Farkas et al. 1990).

Although there is an extensive literature on teacher bias in student evaluations (e.g. Oates 2003; Farkas 2003a; Downey and Pribesh 2004), only few studies explicitly focus on the impact of cultural capital on teacher ability ratings. Farkas et al. (1990) show that teachers' perceptions of children's ability are positively influenced by children's cultural capital. Furthermore, Dumais (2006) finds that US kindergarteners' cultural capital (as measured by cultural activities) has a small positive effect on teachers' evaluations of their reading and math ability. However, this effect is found for low-SES children only. Consequently, there is only scant empirical evidence on the impact of cultural capital on teacher ability ratings, especially outside the US context.

This paper addresses one of the fundamental problems in research on cultural capital and teacher ability ratings: Is it possible to hold constant the 'everything else' that affects teachers' perceptions of children's ability? The hypothesised effect of cultural capital on teacher ability ratings can be represented by a simple counterfactual scenario: Would a teacher change her evaluation of a child if, by means of an experiment, we could change the child's cultural capital? In this hypothetical situation the child's objective academic ability, family background and other characteristics would remain constant and only the child's cultural capital would change. Cultural capital theory hypothesises that in this scenario, due to the positive bias towards cultural capital inherent in the educational system, teachers would change their perception of the child's ability.

The problem in non-experimental research is that a true counterfactual situation cannot be established. Instead, researchers must try to make children comparable by including a wide range of observable child and family background control variables in their analyses. Existing studies on cultural capital differ substantially in the number of control variables they include, and the extent to

which they successfully manage to hold ‘everything else’ constant is unknown (Kingston 2001). It is, however, unlikely that existing studies manage to control for all relevant child and family characteristics which, in addition to cultural capital, affect teachers’ perceptions of children’s ability. This problem would be less important if cultural capital was unrelated to other unobserved characteristics in children or families that might affect teachers’ perceptions of children’s ability. However, it is well-known that cultural capital is correlated with many other child characteristics: academic ability, physical appearance, health, social behaviour and other socioeconomic and family characteristics that might affect teachers’ perceptions of children. Consequently, if one is unable to properly account for these influences it is very difficult to obtain a trustworthy estimate of the effect of cultural capital on teacher ability ratings.

This paper extends existing research on cultural capital and educational success in several ways. First, I use an extremely rich British dataset (the National Child Development Study) which allows me to control for a wide range of child and parental characteristics that might affect teacher ability ratings. These characteristics include academic ability (math and reading ability), physical appearance (Body Mass Index, stammer, squint, laterality and whether one wears glasses), health impairments (hearing and sight), social behaviour (maladjustment), antenatal influences (approximated by birth weight), as well as a wide range of family background and parental characteristics. This comprehensive range of observed characteristics means that I am better able than previous studies to hold constant the relevant child and family characteristics that might affect teacher ability ratings.

Second, I analyse the effect of cultural capital on teacher ability ratings for comparatively young children (my respondents are observed at age 7 and 11). With the exceptions of Cheung and

Andersen (2003) and Dumais (2006), most studies focus on older children (and typically teens) (e.g. Roscigno and Ainsworth-Darnell 1999; Sullivan 2001; Georg 2004) which means that the impact of cultural capital on teacher ability ratings among comparatively young children has received little attention in the literature.

Third, I have longitudinal information on teacher ability ratings (measured at age 7 and 11) and many of the child and parental characteristics. This information allows me to implement a statistical framework that controls for unobserved child characteristics that affect teacher ability ratings. No previous study on cultural capital and educational success has controlled for unobserved child characteristics.

Fourth, unlike most previous studies I have empirical measures of cultural capital for both children and parents. This is particularly important because children and parents' cultural capital might affect teacher ability ratings through different channels (children's cultural capital manifests directly though their habitus while parents' cultural capital manifests indirectly by 'signalling' cultural status to teachers).

Fifth, I analyse if the effect of cultural capital on oral and math ability ratings differs across the rating scale teachers use to evaluate children. In my data teachers evaluate the child's oral and math ability using five-point ordinal scales ranging from 'very poor' to 'exceptional'. I estimate ordered probit random effect models with category-specific effects of cultural capital to determine if child and parental cultural capital is more effective at 'pushing up' teachers' ratings at the lower, middle or higher end of the ordinal assessment scale. My empirical results for oral ability indicate that children's cultural capital works particularly strongly at the higher end of the rating scale (i.e. by

'pushing' children into the more positive rating categories) while parents' cultural capital works particularly strongly at the lower end of the scale (i.e. by pushing children above the very low rating categories). This result suggests a joint effect of cultural capital in which children's cultural capital helps secure a high ability rating while parents' cultural capital 'protects' against a low ability rating.

Theoretical background

The concept of cultural capital

The idea that cultural capital affects educational success originates in Pierre Bourdieu's cultural reproduction theory (Bourdieu 1977, 1984). He argued that individuals and families' cultural resources constitutes a non-material form of capital which should be regarded on equal terms as economic resources (what Bourdieu calls 'economic capital') and gainful social networks (called 'social capital') (see Bourdieu 1986; Bourdieu and Passeron 1990). Although Bourdieu's definition of cultural capital varies (Lamont and Lareau 1988; Lareau and Weininger 2004), at the most general level cultural capital pertains to knowledge of the dominant conceptual and normative codes inscribed in a culture. Cultural capital is used actively by individuals or groups positioned at different levels in social hierarchies as a means of either promoting relative social advantage or as a generalised currency which can be exchanged for other economic or social assets. Consequently, cultural capital serves an important role as a vehicle for enabling individuals with knowledge of institutionalised high-status cultural signals (attitudes, preferences, formal knowledge, behaviours, goods and credentials) to exclude others from advantaged social positions or high-status groups (Lamont and Lareau 1988: 156).

Cultural capital and educational success

Bourdieu sees the social world as comprised from different stratified arenas or *fields* with their own institutional logic, different exchange rates for the different types of capital and agents with different capital endowments engaged in struggles for social advantage. Cultural capital plays a central role in the field of education and is the principal mechanism behind the intergenerational reproduction of social status (Bourdieu 1977, 1984; Bourdieu and Passeron 1990). Two mechanisms explain why cultural capital facilitates educational success.

First, cultural capital, that is, familiarity with high-status cultural signals or 'the rules of the game', is the dominant form of capital in the field of education and is intrinsically valorised. This means that, holding constant children's actual academic ability, children with much cultural capital are more likely to be perceived by teachers as academically gifted compared to children with little cultural capital. Thus, the educational system and teachers are not neutral in their evaluation of children's abilities but have an inbuilt bias towards valorising cultural capital (Bourdieu 1977).

Second, children from culturally advantaged families have more cultural capital than children from less advantaged backgrounds and are better able to exploit their cultural capital. Bourdieu uses the concept of the *habitus* to describe individuals' acquired patterns of though, taste and behaviour. Children's cultural capital, transferred to them from their parents, is embedded in the habitus and becomes manifest to teachers though children's behaviour, language, knowledge and gestures; i.e. through their seemingly natural familiarity with the 'rules of the game' (Bourdieu and Passeron 1990; Dumais 2002, 2006). In doing so, children convert their cultural competences into other advantageous resources such as 'false' positive evaluations of their ability.

The effect of parents' cultural capital

Parents' cultural capital has both a direct and an indirect effect on teacher ability ratings. The indirect effect runs through the intergenerational transmission of cultural capital from parents to children. The direct effect of parents' cultural capital manifests in their interaction with teachers. Lareau and colleagues have shown that parents' interaction with teachers is heavily influenced by their cultural capital (e.g. Lareau 1987, 2003; Lareau and Horvat 1999; Lareau and Weininger 2004). Middle-class parents with high levels of cultural capital are less likely than lower-class parents to accept teachers' authority regarding children's schooling and are better able to negotiate advantages for their children. Furthermore, parents with cultural capital may, knowingly or unknowingly, signal the family's cultural status to teachers which means that, independently of their own cultural capital, children are seen as more gifted due to their 'cultured' family background (Ganzeboom 1982). As I show in the empirical analysis, there is some evidence to support this hypothesis since parents' cultural capital 'protects' children from very low oral ability ratings.

Cultural capital and academic ability

There is an ongoing controversy in the literature on cultural capital regarding whether one can distinguish between cultural capital and academic ability. Some interpreters of Bourdieu believe that academic ability and cultural capital are indistinguishable (e.g. Lareau and Weininger, 2004). However, a more widespread interpretation is that cultural capital and academic ability are different phenomena (e.g. DiMaggio 1982; Ganzeboom 1982; Sullivan 2001). The conceptual distinction between cultural capital and academic ability is important in this paper because I wish to isolate the effect of cultural capital on teacher ability ratings from that of academic ability; the central hypothesis being that cultural capital affects teachers' perceptions of children's ability *net* of objective ability. Conceptually, academic ability pertains to the individual's innate or cultivated

intelligence, i.e. ‘being smart’. Children may have high academic ability due to genetic endowments or parental stimuli, and parents with much cultural capital typically also have children with high academic ability (e.g. Mercy and Steelman 1982; Sullivan 2001; Cheung and Andersen 2003). By contrast, cultural capital pertains to familiarity with institutionalised high-status cultural signals (attitudes, behaviour, tastes etc.) that can be used for ‘status-signalling’ when interacting with gatekeepers in the educational field. Thus, in theory one can ‘be smart’ but not know ‘the rules of the game’ and vice versa. For this reason it is important to distinguish between cultural capital and academic ability.

Other influences

Teachers’ perceptions of children’s ability might depend on many other factors than cultural capital. It is important to address these influences. First and foremost, teacher ability ratings should depend on children’s actual ability. However, many other child characteristics such as socioeconomic background, race, health, physical appearance and social behaviour might also influence teacher ability ratings (e.g. Farkas et al. 1990; Takei, Johnson and Clark 1998; Downey and Pribesh 2004; Gatrell, Popay and Thomas 2004). Furthermore, there is evidence that many of these other factors are correlated with families’ cultural capital. A major strength of this paper is that, unlike previous studies, it explicitly controls for many of these potentially confounding child and family influences.

Another important source of influences on teacher ability ratings is teacher characteristics (Farkas et al. 1990; Farkas 2003b). However, the data I use only provides limited information on teacher (and school and class) characteristics meaning that it is not possible to include these characteristics in the analysis.

Hypotheses

The first and central hypothesis to be tested in the empirical analysis is that, holding everything else constant, cultural capital should have a positive effect on teachers' rating of children's oral and math ability. According to cultural reproduction theory this effect arises from the valorisation of cultural capital which is inbuilt in the educational system. Dumais (2006) finds such an effect of cultural capital in the US and I also expect to find this effect in my British data.

Second, I expect that both children and parents' cultural capital have positive effects on ability ratings. Children display their cultural capital and familiarity with 'the rules of the game' through the habitus while parents signal the family's cultural status to teachers. Consequently, both children and parents' cultural capital should matter.

Third, cultural capital should have a stronger effect on oral ability ratings than on math ratings. Oral activities provide children with better opportunities to display their cultural competences to teachers while math is more closely tied to a fixed curriculum and objective assessment standards. In similar vein, the spill over effect on ability ratings of parents' signalling cultural status to teachers should be lower for math than for oral ability.

Fourth, children and parents' cultural capital might have qualitatively different effects on teacher ability ratings. Children's cultural capital would be expected to be particularly effective with respect to enabling teachers to distinguish between students of average and exceptional ability. Thus, children's cultural capital should matter more at the higher than at the lower ends of the rating scale teachers use to evaluate children. By contrast, parents' cultural capital which signals the family's

cultural status to teachers should provide a buffer against very low ability ratings and thus be more effective at the lower ends of the rating scale.

Data and variables

Data

I use data from the National Child Development Study (NCDS). The NCDS is a representative panel survey of all children (approximately 17500) born during the first week of March 1958 in the United Kingdom (see Plewis et al. 2004 for more information on the NCDS). Follow-ups have been carried out in 1965, 1969, 1974, 1981, 1991 and 1999/2000. In this paper I focus on the 1965 and 1969 waves at which the NCDS respondents were respectively 7 (1965) and 11 (1969) years old. The NCDS has extremely comprehensive information on the primary respondents collected from respondents themselves, parents, schools, medical examinations, administrative records and a range of ability tests. Several types of information such as the teacher's rating of the NCDS child's oral and math ability, medical and health information, performance on different tests and family socioeconomic situation have been collected at several waves. Panel attrition in the early NCDS waves is very low (see Plewis et al. 2004). Table I shows descriptive statistics for the dependent variables and Table II shows descriptive statistics for the independent variables.

-- TABLE I HERE --

Dependent variables

Similar to Dumais (2006), I use the teacher's rating of the NCDS child's oral and number work (i.e. math) ability as the dependent variables in my analysis. The child's oral and number work ability was rated both at age 7 and 11, thereby providing repeated observations on ability ratings in these

fields. The NCDS children were also rated by teachers at age 16. However, these ratings were in different fields (English, social studies, science, etc.) and could not be used. Teachers used a five-point ordinal scale to rate the NCDS children. As can be seen in Table I, the verbal labels used in the rating scales differ slightly between the oral and number work ability scales and between the survey years. However, in all cases there are five ordinal categories with the third category representing 'average' ability.

-- TABLE II HERE --

Independent variables

There is no consensus in the literature regarding how cultural capital should be measured (see Lamont and Lareau 1988; Kingston 2001; Sullivan 2002). Existing studies measure cultural capital using indicators of, for example, *beaux arts* cultural participation (e.g. DiMaggio 1982; Wong 1998), educational resources (e.g. Downey 1995; Eitle and Eitle 2002) and reading behaviour (e.g. Crook, 1997; De Graaf, de Graaf and Kraaykamp 2000). The NCDS includes empirical indicators of reading behaviour (books and newspapers) and library attendance that are in line with the third approach to measuring cultural capital. In the present analysis I use these NCDS measures to construct two variables that capture parents' and children's cultural capital. Cheung and Andersen (2003) and van de Werfhorst et al. (2003) have previously used these NCDS measures to operationalise cultural capital.

Parents' cultural capital

The index measuring *parents' cultural capital* is comprised from nine highly significantly ($p < 0.001$) correlated items measured when the NCDS children were 7 or 11 years old. Items one and

two measure how often mothers and fathers read to the child. The response categories are scored 0 = 'Hardly ever', 1 = 'Occasionally' and 2 = 'Every week'. Items three through six measure how often mothers and fathers read, respectively, newspapers and books. The response categories in these four items are scored 0 = 'Hardly ever', 1 = 'Occasionally' and 2 = 'Most days ('most weeks' for books)'. Item seven measures how often parents go to the library. The response categories in this item are scored 0 = 'Never goes', 1 = 'Goes sometimes/uses school library' and 2 = 'Goes often'. Items eight and nine are dummy variables indicating whether mothers and fathers belong to a library in the last 12 months. The response categories in these variables are scored 0 = 'No' and 1 = 'Yes'. The index of parents' cultural capital summarises parents' total score on the nine items. Cronbach's Alpha for the index is 0.737 which indicates that the index has fairly high reliability.

Children's cultural capital

The index measuring *children's cultural capital* is comprised from four highly significantly ($p < 0.001$) correlated items measured when the child was 11 years old. Item one is a dummy variable indicating if the child borrows books from the library and is scored 0 = 'No' and 1 = 'Yes'. Items two through four measure how often the child reads books for pleasure (not homework), reads magazines and listens to music. All three items are scored 0 = 'Hardly ever', 1 = 'Sometimes' and 2 = 'Most days'. The index of children's cultural capital summarises children's total score on the four items and Cronbach's Alpha for the index is 0.734. The correlation between parents and children's cultural capital is 0.252 ($p < 0.001$).

In addition to the two cultural capital variables I include a broad range of variables that might affect teacher ability ratings. These variables measure children's academic performance, physical appearance, health, social behaviour and family background. Some of these variables are measured

twice (i.e. both when children are 7 and 11 years old) and some variables are measured once. Also, in some cases I have computed dummy variables for missing values.

Academic performance

The NCDS children were subjected to standardised reading and math ability tests both at age 7 and 11. The reading and math ability tests have different scales and in the empirical analysis I have standardised all four test score variables.

Physical appearance

Several indicators of children's physical appearance are available in the NCDS. First, I control for Body Mass Index (BMI) and calculate separate BMI measures for boys and girls. Second, I include dummy variables for being a stammer (1 = yes; 0 = no), having a squint, being left handed and wearing glasses.

Health impairments

The NCDS collects data from medical examinations. In the present analysis I include measures of sight and hearing ability. At age 7 and 11 a medical doctor assessed children's sight on the right and left eye using a vision test (with higher scores indicating poorer sight). I include the scores from this vision test in the analysis. Tests of hearing ability on both ears (with higher scores indicator poorer hearing) were also carried out at age 7 and 11. The hearing tests have different scales at age 7 and 11 (1-8 vs. 1-9) and, consequently, I use standardised scores from both hearing tests in the analysis. I use vision and hearing scores for the right eye and ear only (respondents' scores for the right and left eye/ear are highly correlated and it does not make any difference whether I use data on the right or left eye/ear).

Social behaviour

The NCDS includes a measure of social maladjustment, the Bristol Social Adjustment Guide (BSAG). The BSAG is comprised from a battery of items in which teachers evaluate children through a large number of phrases which describe a child's behaviour. These phrases are, for example, withdrawal, anxiety, hostility towards adults and restlessness (see Stott 1969). The BSAG score included in the NCDS summarises children's score on all the different phrases, with higher values indicating more social maladjustment.

Antenatal influences

I approximate the influence of antenatal influences by the NCDS child's birth weight in kilograms (see Behrman and Rosenzweig 2004).

I also control for birth order.

Family background

I include a range of family background variables. First, I control for mother and father's BMI. Mother's BMI is recoded in 1958 and father's BMI is recoded in 1969. Second, I control for family size, i.e. the total number of children in the family. Third, I control for father's social class position with the following classes based on the Register General's 1960 Occupational classification: (1) Professional, (2) Managerial/technical, (3a) Skilled non-manual, (3b) Skilled manual, (4) Partly skilled and (5) Unskilled. Fourth, I control for mother and father's education measured by years of completed schooling. Fifth, I control for home ownership (1 = yes, 0 = no) and total number of rooms in the dwelling. Sixth, I control for the natural logarithm of gross monthly family income in

Pounds Sterling. Seventh, I include a dummy variable for families in which English is not the usual language spoken in the home. Finally, I control for family type with a dummy variable for intact families (i.e. families in which the NCDS child lives with both biological parents).

Analytical approach

I estimate ordered probit models to analyse the effect of cultural capital on teacher ability ratings (Agresti 2002). Furthermore, I extend the standard ordered probit framework in two aspects.

First, I exploit the longitudinal structure of the NCDS data and include random effects in the models to account for unobserved child characteristics that affect teachers' ability ratings (e.g. Wooldridge, 2002).[1] Second, I relax the proportional odds assumption in the ordered probit model for the effect of the cultural capital variables on teacher ability ratings. The ordered probit model assumes that the effect of the cultural capital variables on the probability of obtaining a higher ability rating is the same across the whole range of the ability rating scale. This means that the effect of a one-unit increase in cultural capital is the same for movements at the lower end of the scale, e.g. from 'very poor ability' to 'below average ability', and at the higher end of the scale, e.g. from 'above average' to 'exceptional'. As children and parents' cultural capital may have different effects at different points in the ability rating scale I test if the proportional odds assumption holds in my data. Furthermore, I estimate partial proportional odds models in which the effect of children and parents' cultural capital is allowed to vary over the range of the ordered response scale (see Peterson and Harrell Jr. 1990).

Results

The objective of the empirical analysis is to test if children and parents' cultural capital affects teachers' ratings of children's oral and number work ability. Unlike previous studies I control for many child and parental characteristics *other* than cultural capital that might affect teachers' perception of children's ability. Consequently, the present analysis is particularly suited to isolate the effect of cultural capital on ability ratings vis-à-vis other family background factors that are correlated with, but substantively different from, cultural capital.

I estimate four models for each of the two outcome variables. I gradually add more variables to the models, thereby assessing the extent to which these variables mediate the effect of children and parents' cultural capital. All models also control for unobserved child characteristics through the inclusion of random effects. Finally, I test the assumption of proportional odds for the effect of children and parents' cultural capital on teacher ability ratings and estimate partial proportional odds models.

-- TABLE III HERE --

Table III shows results from the random effect ordered probit models for oral ability rating. Model 1 includes children and parents' cultural capital as the only explanatory variables. Both variables have highly significant positive effects on teacher ability ratings indicating that cultural capital has a strong impact on teachers' assessments of children's oral ability. Because both cultural capital variables are standardised model 1 furthermore shows that parents' cultural capital (effect = 0.425) has a stronger effect on oral ability rating than children's cultural capital (effect = 0.258). Finally, the random effect variance (Rho) which expresses the average correlation in teachers' ratings of

children's oral ability at age 7 and 11 is highly significant. The significant random effect shows that unobserved as well as observed child characteristics affect oral ability rating.

Model 2 includes children's math and reading ability. Objectively, teachers' perceptions of children's ability should depend only on children's actual ability. Cultural capital theory hypothesises that this is not the case because, holding constant objective ability, children with cultural capital receive a 'bonus' in the form of an upward bias in teachers' perceptions of their ability. Model 2 shows that, net of math and reading ability, both children and parents' cultural capital have highly significant positive effects on teachers' oral ability ratings. Thus, there is empirical evidence that cultural capital positively affects teachers' assessment of children net of children's objective ability. However, compared to model 1 the effects of cultural capital are much lower when I control for math and reading ability.

Model 3 includes the different child characteristics. Again, I find that the effect of children's cultural capital decreases (from 0.095 to 0.069) but remains highly significant. This result indicates that in the previous models my measure of children's cultural capital also captures the effect of child attributes other than cultural capital whose impact on teachers' ratings of children's oral ability is now explicitly controlled. From the model I also find that both boys and girls' BMI has a highly significant negative effect on oral ability rating. Consequently, independently of their objective math and reading ability, children who are overweight are perceived by teachers as having lower oral ability than children who are of normal weight. Furthermore, while the dummy variables for children's sex, laterality and whether or not they have a squint are not significant, I find that children who stammer, have poor hearing and sight, are misbehaving and who are of higher birth order are perceived by teachers as having lower oral ability. Finally, model 3 also shows that

children with higher birth weight receive better oral ability ratings than children with lower birth weight. The birth weight effect might capture the influence of other physiological traits which are not properly captured by the other child variables.

Model 4 includes the parental and family background variables. Interestingly, after adding these variables to the model the effect of children's cultural capital on oral ability rating increases from 0.069 to 0.090 and remains highly significant. Apparently, in model 3 I underestimate the effect of children's cultural capital. Compared to model 3, the effect of parents' cultural capital decreases from 0.142 to 0.090 in model 4. This is not surprising given that model 4 includes many more parental characteristics. From model 4 I also find that the effects of children and parents' cultural capital on teachers' ratings of children's oral ability are largely identical (0.090 and 0.096 respectively). The effects of the family background variables are also as anticipated. Children whose fathers are in lower social class positions receive lower oral ability ratings. Furthermore, parents' education and home ownership are positively related to oral ability rating.

-- TABLE IV HERE --

Table IV shows results for the ordered probit models in which number work rating is the outcome variable. As with oral ability model 1 shows that both children and parents' cultural capital has highly significant positive effects on number work rating. When I add math and reading ability in model 2 I find that the effects of the cultural capital variables decrease considerably but remain highly significant. Consequently, cultural capital appears to affect teachers' perceptions of children's math ability as well as their oral ability. When I control for child characteristics in model 3 I find that parents' cultural capital no longer has any significant effect on math ability rating. This

finding suggests, as hypothesised, that math ability rating depends principally on child cultural capital and that parents' signalling of the family's cultural status does not benefit children in this regard. In addition, I find that boys with higher BMI receive lower number work rating, as do also, in general, girls, children with sight and hearing impairments and children of higher birth order and with higher BSAG scores. As was also the case for oral ability birth weight has a positive effect on number work ability. Finally, in model 4 I include parental characteristics. When I add these variables to the model the effect of parents' cultural capital remains insignificant and the effect of children's cultural capital increases slightly. Substantively, I find that mother's BMI has a negative impact on teachers' ratings of children's number work ability while mother's education has a positive impact. None of the other parental characteristics are significant.

In summary, there is empirical evidence that, net of objective ability, many child and parental characteristics and unobserved child characteristics, cultural capital has a positive effect on teachers' perceptions of children's ability. This finding supports cultural reproduction theory. Both children and parents' cultural capital affects oral ability ratings while parents' cultural capital does not affect number work rating. As hypothesised, this result indicates that returns to cultural capital are higher for oral ability than for math ability. This finding is not surprising given that children with cultural capital have better opportunity to signal linguistic sophistication and familiarity with 'the rules of the game' when they express themselves orally than when they do math.[2]

As the final part of the empirical analysis I test if the effect of cultural capital is constant across the range of the scale teachers use to rate children. I hypothesised that maybe children and parents' cultural capital work particularly strongly at different ends of the rating scale. Theoretically, parents' cultural capital signals to teachers that children come from a cultured family which in turn

has a positive spill over effect on teachers' evaluations of children. Thus, if teachers perceive children to come from a cultured family they might apply a different (i.e. higher minimum) standard when they rate these children's ability. By contrast, children's cultural capital might be particularly effective at the higher ends of the rating scale because children themselves need to 'show off' their cultural capital through the habitus to be perceived by teachers as having exceptional ability.

-- TABLE V HERE --

The upper part of Table V presents results from tests of proportional odds for the effect of children and parents' cultural capital on oral and number work rating. The test of proportional odds is a test of whether the effect of children and parents' cultural capital is the same across all categories of the ordinal rating scale. Violation of the proportional odds assumption means that the effect is not constant and that I need to estimate separate effects of cultural capital for each threshold in the ordered probit model. The thresholds are the cut points in the ordinal rating scale where teachers shift from a lower to a higher rating category. Since there are five categories in the rating scale the ordered probit model estimates four cut points (for example, in the case of oral ability at age 11 shifts occur from (1) 'very limited' to 'below average'; (2) 'below average' to 'average'; (3) 'average' to 'above average'; and (4) 'above average' to 'exceptional'). The partial proportional odds model which is an alternative to the ordered probit model relaxes the proportional odds assumption by estimating different effects of the cultural capital variables on ability ratings for each cut point (but retains the proportional odds assumption for the other explanatory variables).[3]

From the upper part of Table V I find that, in the case of oral ability, a likelihood ratio (LR) test clearly rejects the proportional odds assumption for both children and parents' cultural capital and,

in the case of number work ability, the proportional odds assumption is weakly rejected for parents' cultural capital. The lower part of Table V shows the estimated effects of children and parents' cultural capital on oral and math ability ratings from the partial proportional odds models. For oral ability rating I find that children's cultural capital does not have any effect on the probability of moving from the lowest to the second-lowest rating category. In other words, children's cultural capital does not help to distinguish between children whom teachers believe have 'very poor' and 'poor' oral ability. By contrast, children's cultural capital has a highly significant and positive effect on the probability of moving into the higher rating categories. This finding indicates that children's cultural capital is a stronger predictor of oral ability rating at the higher than at the lower end of the rating scale. Theoretically, following Bourdieu this result can be interpreted as suggesting that children's cultural capital is particularly helpful in convincing teachers that children have exceptional rather than average oral ability. Children's cultural capital thus functions as a resource which can be used to signal cultural competence to key gatekeepers in the educational system.

Interestingly, my results for parents' cultural capital from the partial proportional odds model suggest the opposite scenario. Here, I find that parents' cultural capital has a significant positive effect at the lower and middle end of the rating scale but does not have any effect at the top end of the scale; i.e. on the probability of moving from 'above average' (category 4) to 'exceptional' (category 5). Theoretically, this finding indicates that parents with cultural capital signal the family's cultural status to teachers. In doing so, there is a spill over effect on children in the sense that, coming from a 'cultured' family, they are perceived by teachers as generally having higher oral ability level compared to children from 'uncultured' families. Together, my empirical results for oral ability suggest a joint effect of cultural capital in that parents' cultural capital protects

children against very low oral ability ratings and children's own cultural capital helps them to be perceived by teachers as exceptionally talented.

My results for number work rating are less outspoken. There is weak evidence that the proportional odds assumption is violated for parents' cultural capital, but the results from the partial proportional odds model does not provide any clear picture. However, as explained above this finding makes sense given that cultural capital has a much stronger effect on oral ability rating than on number work rating.

Conclusion

The aim of this paper has been to test one of the key hypotheses in cultural reproduction theory: that, holding 'everything else' constant, children with high levels of cultural capital are perceived by teachers as more gifted than children with low levels of cultural capital. Little empirical work has been done on this topic so far. Furthermore, existing empirical studies on cultural capital differ substantively in the degree to which they are reasonably able to hold 'everything else' constant. This is a major problem because cultural capital variables potentially act as proxies for child and family characteristics that affect teachers' ratings of children's ability but which are substantively different from cultural capital. Consequently, existing estimates of the effect of cultural capital on teacher ability ratings might be too optimistic.

In the present paper I use extremely rich longitudinal data from the United Kingdom to control for many of the potentially confounding observed and unobserved factors which might affect teachers' perceptions of children but which are substantively different from cultural capital. In addition to cultural capital, I control for children's actual ability, physical appearance, health impairments,

social behaviour, family background and unobserved characteristics. This richness of controls means that I am better able to hold 'everything else' constant than previous studies.

In the empirical analysis of teacher's ratings of children's oral and number work ability I find, first, that children's cultural capital has a positive effect on oral and number work rating and, second, that parents' cultural capital affects oral ability rating but not number work rating. Consequently, despite controlling for a rich set of child and family variables and unobserved child characteristics my analysis suggests that cultural capital *does* have an effect on teachers' rating of children's ability. This result is in line with the central argument in cultural reproduction theory that teachers reward students who express familiarity with the dominant cultural codes and who know 'the rules of the game' in the educational system. Moreover, I find that, net of their *actual* ability, many other child characteristics such as BMI, stammer, sight and hearing, sex and birth weight affect teachers' perceptions of children's ability. Some of these characteristics are correlated with children's cultural capital and, had they not been observed, I would have arrived at a too optimistic estimate of the effect of the cultural capital variables. Finally, my analysis of oral ability rating shows that children's cultural capital is particularly effective at the higher end of the rating scale, i.e. by 'pushing' children into the very positive rating categories while parents' cultural capital is particularly effective at the lower end of the rating scale, i.e. by 'protecting' children against very low oral ability ratings.

The present study extends the existing literature on cultural capital by focusing on one of the key mechanisms though which cultural capital is converted into other useful resources: biased teacher evaluations of children's ability. This positive bias translates into favourable treatment and higher grades, both of which factors that help children to succeed in the educational system (Lareau 1987,

2003). The present analysis does not analyse the long-term returns to cultural capital investments but existing studies suggest that these returns exist (e.g. de Graaf and Kalmijn 2001) and are worthwhile studying. Consequently, the long-term returns to cultural capital should be studied further.

A second contribution of the present study is that it demonstrates how parents and children's cultural capital have different but complementary effects on teacher ability ratings. My finding that children's cultural capital helps them to be perceived by teachers as 'exceptional' while parents' cultural capital sets a higher minimum level for how teachers perceive children's ability fits well with Bourdieu's cultural reproduction theory. According to Bourdieu both parents and children seek to maximise returns to cultural capital and they use whichever channels serve this purpose. My analysis suggests that at least two different channels exist. Future research should investigate if similar effects also exist in other countries.

Several important weaknesses in the present analysis should also be acknowledged. First, my empirical operationalisation of children and parents' cultural capital based on reading habits represents one among several possible approaches to measuring cultural capital. The NCDS data does not include indicators of *beaux arts* cultural participation or taste which are more often used to measure cultural capital. However, Dumais (2006) uses *beaux arts* indicators of cultural capital and finds only small effects of these indicators on teacher ability ratings. She speculates that the dimensions of cultural capital captured by *beaux arts* indicators are less important when children are young. Consequently, my operationalisation of cultural capital based on reading behaviour might be more relevant.

Second, due to limitations in the NCDS it was not possible to include teacher characteristics in the analysis. Obviously, teacher characteristics such as sex, age, experience, family background and attitudes are important factors for explaining how teachers perceive children. This limitation means that an important source of variation in teacher ability ratings remains unexplored in this paper.

Notes

1. A fixed effect ordered logit approach (Ferrer-i-Carbonell and Frijter 2004) would have been preferable. However, since I do not have repeated observations on parents and children's cultural capital the fixed effect approach is unfeasible because the effect of the cultural capital variables is subsumed into the fixed effect and cannot be estimated.

2. The NCDS also includes two dummy variables measuring teachers' evaluations of whether children have difficulties with speech and English at age 7 and 11 (1 = yes, 0 = no). I do not include these variables in the analysis because they relate less directly to cultural capital and because, being binary, they contain less information than the ordinal variables used in the analysis. I have, however, run (binary) probit models similar to the ones reported in Tables III and IV and I get approximately the same results as those reported in the empirical analysis.

3. I might also have tested the proportional odds assumptions for the other explanatory variables in the model. However, because the other explanatory variables are of less substantive interest and because the statistical model would then become very complex I chose to maintain the proportional odds assumption for these variables.

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Table I: *Teacher's rating of student's oral and number work ability. Per cent*

	Age 7	Age 11
Oral ability:		
Very poor ability/Very limited	4.0	2.2
Below average/Below average	17.6	19.9
Average ability/Average	52.8	54.9
Good vocabulary/Above average	14.5	20.5
Expresses well/Exceptional	11.1	2.5
N	15017	14095
Number work:		
Little ability/Very limited	3.9	5.2
Slow learner/Below average	31.6	32.4
Average ability/Average	43.6	37.7
Good ability/Above average	17.8	20.7
Very quick learner/Exceptional	3.1	4.0
N	15013	14073

Note: Labels on the left-hand side of '/' in column 1 refer to age 7 and entries on the right-hand side refer to age 11.

Table II: *Descriptive statistics for the independent variables. Means with standard deviations in parenthesis*

	Age 7	Age 11
Child's cultural capital[a]		0 (1.000)
Parents' cultural capital[a]	0 (1.000)	
Math ability	0 (1.000)	0 (1.000)
Reading ability	0 (1.000)	0 (1.000)
BMI boys	7.001 (7.996)	7.290 (8.765)
BMI girls	6.454 (7.902)	6.956 (8.871)
Child's sex (= girl)[a]	0.483 (0.500)	
Squint	0.055 (0.227)	0.050 (0.217)
Left-handed	0.081 (0.273)	0.077 (0.266)
Stammer	0.009 (0.092)	0.034 (0.181)
Glasses	0.049 (0.217)	0.082 (0.275)
Sight, right eye	1.293 (0.849)	1.434 (1.205)
Hearing, right ear	0 (1.000)	0 (1.000)
Birth order	2.258 (1.586)	1.956 (1.096)
BSAG score	8.816 (8.875)	8.497 (8.987)
Birth weight in kg.[a]	3.295 (0.579)	
Missing data on birth weight[a]	0.0957 (0.294)	
Mother's BMI[a]	23.867 (3.977)	
Father's BMI[a]	24.741 (3.157)	
Family size[a]	3.460 (1.834)	
Missing data on family size[a]	0.383 (0.486)	
Father's social class		
Professional	0.040 (0.197)	0.039 (0.194)
Managerial/technical	0.112 (0.315)	0.127 (0.333)
Skilled non-manual	0.076 (0.265)	0.065 (0.246)
Skilled manual	0.346 (0.476)	0.300 (0.458)
Partly skilled	0.136 (0.343)	0.122 (0.327)
Unskilled	0.050 (0.218)	0.042 (0.200)
Missing data on father's class	0.240 (0.427)	0.305 (0.461)
Mother's education[a]	9.975 (1.611)	
Missing data on mother's education[a]	0.384 (0.486)	
Father's education[a]	10.014 (.2030)	
Missing data on father's education[a]	0.402 (0.490)	
Home owner	0.331 (0.471)	0.341 (0.474)
No. of rooms in home	4.784 (1.330)	4.960 (1.354)
Log family income[a]	2.317 (2.599)	
Missing data on log family income[a]	0.138 (0.344)	
English not spoken in home	0.083 (0.276)	0.024 (0.154)
Intact family	0.735 (0.442)	0.674 (0.469)

Note: [a] Variable observed once.

Table III: *Random effect ordered probit regressions of teacher's rating of child's oral ability*

Model	1	2	3	4
Child's cultural capital	0.258 (0.014)***	0.095 (0.010)***	0.069 (0.010)***	0.090 (0.013)***
Parents' cultural capital	0.425 (0.013)***	0.162 (0.009)***	0.142 (0.010)***	0.096 (0.011)***
Math ability		0.337 (0.011)***	0.295 (0.011)***	0.293 (0.012)***
Reading ability		0.584 (0.011)***	0.503 (0.013)***	0.480 (0.013)***
BMI boys			-0.028 (0.005)***	-0.025 (0.006)***
BMI girls			-0.018 (0.005)***	-0.015 (0.005)**
Child's sex (girl)			-0.062 (0.122)	-0.044 (0.128)
Squint			0.048 (0.037)	0.037 (0.040)
Left-handed			-0.042 (0.029)	-0.038 (0.031)
Stammer			-0.272 (0.053)***	-0.269 (0.056)***
Glasses			-0.028 (0.039)	-0.038 (0.042)
Sight, right eye			-0.023 (0.010)*	-0.022 (0.011)*
Hearing, right ear			-0.037 (0.009)***	-0.027 (0.009)**
Birth order			-0.083 (0.007)***	-0.059 (0.008)***
BSAG score			-0.038 (0.001)***	-0.039 (0.001)***
Birth weight			0.087 (0.018)***	0.085 (0.019)***
Mother's BMI				-0.002 (0.003)
Father's BMI				-0.002 (0.003)
Family size				-0.020 (0.008)*
Father's social class				
Professional				-0.085 (0.045)
Managerial/technical				-0.070 (0.050)
Skilled non-manual				-0.187 (0.046)***
Skilled manual				-0.203 (0.049)***
Partly skilled				-0.319 (0.060)***
Mother's education				0.044 (0.008)***
Father's education				0.014 (0.007)*
Home owner				0.070 (0.021)***
No. of rooms in home				0.007 (0.008)
Log family income				0.014 (0.020)
English not spoken in home				0.063 (0.034)
Intact family				-0.159 (0.060)**
Rho	0.513 (0.009)***	0.179 (0.012)***	0.154 (0.014)***	0.141 (0.015)***
Log-likelihood	-28432	-24912	-21067	-18166

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ (two-tailed tests). Models also include dummy variables for missing data on birth weight, log family income, father's education, mother's education, father's social class and family size.

Table IV: *Random effect ordered probit regressions of teacher's rating of child's number work ability*

Model	1	2	3	4
Child's cultural capital	0.262 (0.015)***	0.063 (0.010)***	0.055 (0.011)***	0.064 (0.013)***
Parents' cultural capital	0.351 (0.013)***	0.030 (0.009)**	0.014 (0.009)	0.007 (0.011)
Math ability		0.857 (0.011)***	0.808 (0.013)***	0.808 (0.014)***
Reading ability		0.435 (0.011)***	0.378 (0.012)***	0.372 (0.013)***
BMI boys			-0.022 (0.005)***	-0.023 (0.008)***
BMI girls			0.002 (0.005)	0.006 (0.005)
Child's sex (girl)			-0.500 (0.122)***	-0.571 (0.127)***
Squint			-0.051 (0.037)	-0.063 (0.039)
Left-handed			-0.022 (0.028)	-0.024 (0.030)
Stammer			-0.021 (0.052)	-0.013 (0.055)
Glasses			0.038 (0.039)	0.039 (0.041)
Sight, right eye			-0.020 (0.010)*	-0.021 (0.010)*
Hearing, right ear			-0.019 (0.009)*	-0.020 (0.009)*
Birth order			-0.020 (0.006)**	-0.023 (0.008)**
BSAG score			-0.035 (0.001)***	-0.036 (0.001)***
Birth weight			0.080 (0.069)***	0.090 (0.019)***
Mother's BMI				-0.009 (0.002)***
Father's BMI				0.001 (0.003)
Family size				0.008 (0.007)
Father's social class				
Professional				0.020 (0.044)
Managerial/technical				0.010 (0.049)
Skilled non-manual				-0.009 (0.045)
Skilled manual				-0.015 (0.049)
Partly skilled				0.009 (0.059)
Mother's education				0.020 (0.008)*
Father's education				0.004 (0.007)
Home owner				-0.025 (0.021)
No. of rooms in home				-0.009 (0.008)
Log family income				0.033 (0.019)
English not spoken in home				0.050 (0.035)
Intact family				-0.027 (0.059)
Rho	0.595 (0.007)***	0.149 (0.012)***	0.122 (0.014)***	0.116 (0.014)***
Log-likelihood	-29685	-23549	-20103	-17647

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ (two-tailed tests). Models also include dummy variables for missing data on birth weight, log family income, father's education, mother's education, father's social class and family size.

Table V: *Tests for proportional odds and results from partial proportional odds models*

	Oral ability		**Number work**	
	Child's cultural capital	Parent's cultural capital	Child's cultural capital	Parent's cultural capital
LL, proportional odds model	-18166	-18166	-17647	-17647
LL, non-proportional odds model	-18148	-18150	-17643	-17641
Chi-square difference in model fit	36.856	32.782	7.248	10.82
p-value for LR test	< 0.001	< 0.001	0.123	0.027
	Results from partial proportional odds models			
Proportional odds model:	0.090 (0.013)***	0.096 (0.011)***	0.064 (0.013)***	0.007 (0.011)
Partial proportional odds model:				
Threshold 1	-0.015 (0.022)	0.030 (0.019)***	-	-0.034 (0.025)
Threshold 2	0.110 (0.017)***	0.124 (0.014)***	-	-0.013 (0.015)
Threshold 3	0.111 (0.019)***	0.102 (0.015)***	-	0.035 (0.014)*
Threshold 4	0.124 (0.036)***	0.038 (0.030)	-	-0.005 (0.026)

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ (two-tailed tests), LL = Log-likelihood, LR = Likelihood ratio test. Models include the same variables as those in model 4 in Table III and Table IV.