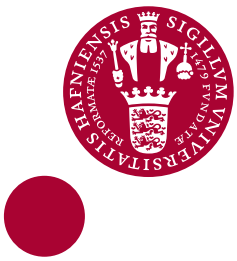

Cultural Capital in Context: Heterogeneous Returns to Cultural Capital Across Schooling Environments

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Cultural capital in context: Heterogeneous returns to cultural capital across schooling environments

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ABSTRACT

This paper tests two competing explanations of differences in returns to cultural capital across schooling environments: Cultural reproduction (cultural capital yields a higher returns in high-achieving environments than in low-achieving ones) and cultural mobility (cultural capital yields higher returns in low-achieving environments). Using multilevel mixture models, empirical results from analyses based on PISA data from three countries (Canada, Germany, and Sweden) show that returns to cultural capital tend to be higher in low-achieving schooling environments than in high-achieving ones. These results principally support the cultural mobility explanation and suggest that research should pay explicit attention to the institutional contexts in which cultural capital is converted into educational success.

1. Introduction

Pierre Bourdieu's theory of cultural reproduction offers an influential explanation of the mechanisms that generate intergenerational inequalities in educational outcomes. Bourdieu famously argued that parents transmit cultural capital to children, children convert their acquired cultural capital into academic success and, as a consequence, families who possess cultural capital have a comparative advantage which helps them to reproduce their privileged socioeconomic position (Bourdieu, 1977, 1984; Bourdieu and Passeron, 1990). The theory of cultural reproduction has motivated much empirical research, most of which documents positive correlations between cultural capital and educational success (Aschaffenburg and Maas, 1997; Cheadle, 2008; De Graaf et al., 2000; DiMaggio, 1982; DiMaggio and Mohr, 1985; Dumais, 2002; Jæger, 2009; Roscigno and Ainsworth-Darnell, 1999; Sullivan, 2001; van de Werfhorst and Hofstede, 2007; Xu and Hampden-Thompson, 2012; Yamamoto and Brinton, 2010).

Although previous research documents positive correlations between cultural capital and educational success, we know surprisingly little about the institutional contexts that generate these correlations. Bourdieu argued that the educational system comprises a *field* within society: an institutional setting governed by a particular set of rules and inhabited by agents with varying levels and compositions of economic, cultural, and social capital (Bourdieu, 1977, 1986). In the field of education, cultural capital is converted into educational success via an institutionalized misrecognition of cultural capital as academic brilliance. Empirical research supports this idea by documenting that, net of actual academic ability, teachers and other gatekeepers perceive children who possess cultural capital as more academically gifted than those who do not possess cultural capital (Dumais, 2006; Dumais et al., 2012; Farkas et al., 1990).

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An important yet unresolved question is whether cultural capital yields the same rate of return throughout the educational system. Most educational systems are internally stratified into levels and tracks that differ with regard to curriculum, peer composition, and teacher qualifications (Kerckhoff, 1995; Shavit and Müller, 2006). As a consequence, it is likely that the appreciation of cultural capital also differs across the educational system, and even across tracks or schooling environments within the same educational level. Previous research has analyzed the average (or "system wide") effect of cultural capital on educational success and, thus, it offers no insight into potential heterogeneity in the returns to cultural capital within the educational system.

This paper extends previous research by analyzing if the effect of cultural capital on academic achievement varies across schooling environments characterized by high and low academic achievement. The theoretical motivation for analyzing this question stems from Bourdieu's (1977, 1986) contention that *subfields* may exist within the field of education in which the value of cultural capital with regard to promoting educational success differs and, moreover, from research which argues that institutional settings, including educational tracking and peer composition, contribute to educational inequality (Gamoran, 2010; Shavit and Müller, 2006). The empirical motivation stems from research showing that the effect of cultural capital on educational success varies by students' socioeconomic status (SES) and, specifically, that the link between cultural capital and educational success is stronger among low-SES students than among high-SES students (Aschaffenburg and Maas, 1997; DiMaggio, 1982; Dumais, 2006). Given that high- and low-SES students tend to be in schooling environments characterized by different curricula, peers, and teachers, observed differences in returns to cultural capital with regard to academic achievement might arise from differences across schooling environments in the appreciation of cultural capital. This idea is further supported (1) by research showing that middle class (but not working class) parents successfully "work the system" and use their cultural capital to negotiate advantages on behalf of their children (Lareau, 2003; Lareau and Horvat, 1999; Lareau and Weininger, 2003, 2008); (2) research finding that children actively use their cultural capital to shape teachers' (and other gatekeepers') perceptions of their academic ability (Dumais, 2006; Wildhagen, 2009); and (3) research documenting non-trivial cross-country (and cross-cultural) differences in the link between cultural capital and educational success (Barone, 2006; Buyn et al., 2012; Evans et al., 2010; Lee and Rouse, 2011; Park, 2008; Tramonte and Willms, 2010; Xu and Hampden-Thompson, 2012; Yamamoto and Brinton, 2010).

In this paper we extend previous research by empirically distinguishing different latent schooling environments and by testing directly if, net of other factors, cultural capital yields higher returns with regard to academic achievement in some schooling environments than in others. We analyze PISA data from three countries (Canada, Germany, and Sweden), which include multiple students from each school. We use multilevel mixture models and identify two latent schooling environments within each country characterized by high and low academic achievement and by high and low variance in achievement. We argue that mean academic achievement and the variance in achievement within a schooling environment (which in part reflects the amount and composition of cultural capital in that environment) shapes the rate of return to cultural capital because, first, the appreciation of cultural capital may be higher in a high-achieving (and high-SES) environment than in a low-achieving (and low-SES) one and, second, the variance in achievement within a schooling environment is indicative of the level of competition students face when attempting to "show off" their cultural capital to teachers. We also hypothesize, and show, that high-achieving schooling environments tend to be occupied by students from high-SES families and families that possess much cultural capital.

Building on previous research, we test two competing models that predict different rates of return to cultural capital in high- and low-achieving schooling environments respectively: cultural reproduction and cultural mobility. Bourdieu's *cultural reproduction* model predicts that returns to cultural capital are higher in high-achieving (and low variance) schooling environments than in low-achieving (and high variance) environments because the former is populated by students and teachers who appreciate cultural capital and who are similar with regard to academic performance and cultural norms (Bourdieu, 1977). By contrast, the *cultural mobility* model predicts that returns to cultural capital are higher in low-achieving (and high variance) schooling environments than in high-achieving ones because, in the former, cultural capital is scarcer and, if possessed, it makes a bigger impression (DiMaggio, 1982).

The main finding from our empirical analysis is that, across the three countries under study, cultural capital tends to have a stronger effect on academic achievement in low-achieving (and high-variance) schooling environments than in high-achieving (and low-variance) ones. This result supports the cultural mobility model and the idea that students in low-achieving (and low-SES) schooling environments who possess cultural capital have a particularly high return to their cultural capital in terms of academic achievement. By implication, our results provide little support for Bourdieu's contention that cultural capital is an "inequality multiplier" that helps advantaged students in high-achieving schooling environments to get ahead. From a theoretical perspective, our results suggest that institutional contexts, in this case schooling environments shape the rate of return to cultural capital and should be explicitly considered in research on cultural capital and educational success.

2. Theoretical background

Our theoretical framework has three components. First, we introduce the concept of cultural capital and discuss its role for educational success. Second, we present the cultural reproduction and the cultural mobility models which predict heterogeneous returns to cultural capital across schooling environments. Third, we discuss how the impact of cultural capital might vary across schooling environments characterized by different levels of academic achievement and different variances in achievement.

2.1. The concept of cultural capital

Bourdieu (1977, 1984, 1986) defined cultural capital as familiarity with the dominant cultural codes inscribed in a society. He argued that cultural resources constitute an immaterial type of capital which should be regarded on equal terms as economic resources (referred to as *economic capital*) and social networks (referred to as *social capital*). Cultural capital is possessed by families and individuals and is transmitted from parents to children through investments and socialization. In addition to being a resource in its own right, cultural capital is a generalized currency which can be exchanged into economic and social capital. Lamont and Lareau (1988:156) offer an influential definition of cultural capital, and its function, as "(...) institutionalized, i.e., widely shared, high status cultural signals (attitudes, preferences, formal knowledge, behaviors, goals, and credentials) used for social and cultural exclusion." This definition, which we follow in this paper, highlights the fact that cultural capital is a scarce resource which can be invested to create more (or other types of) capital and which fundamentally serves to exclude others from advantaged social positions.

2.2. Cultural capital and educational success

According to Bourdieu, cultural capital exists in three states: *embodied* (linguistic competence, mannerisms, cultural knowledge, etc.), *objectified* (cultural goods, pictures, books, etc.), and *institutionalized* (educational credentials) (Bourdieu, 1977, 1986; Bourdieu and Passeron, 1990), and it may promote social reproduction in all three states.

First, parents transmit cultural capital to children, either passively via children being exposed to parents' objectified and embodied cultural capital in the home, or actively via parents' investments in transmitting their cultural capital to children (Cheung and Andersen, 2003; Lareau, 2003). Children inherit parents' cultural capital, which becomes an integral part of their endowments and dispositions, i.e., what Bourdieu labels their *habitus*.

Second, Bourdieu argues that cultural capital is a particularly valuable resource within the field of education (Bourdieu, 1977, 1984; Bourdieu and Passeron, 1990). The educational system is intrinsically biased toward valorizing cultural capital, and it ascribes positive qualities, such as academic brilliance, onto those who possess it. Compared to those who do not possess cultural capital, children who possess cultural capital are more familiar with "the rules of the game" in the educational system and, as a consequence, they are better equipped to present an impression of academic brilliance to teachers and peers. Returns to cultural capital materialize through better academic performance because children who possess cultural capital appear more talented than they actually are (which leads to better subjective evaluations by teachers and to higher grades) and, moreover, they have better learning environments (because teachers pay more attention to them).

2.3. Schooling environments and educational success

The educational system plays a key role in the theory of cultural reproduction because it represents the institutional mechanism through which cultural capital is converted into educational success. Most previous research assumes that the rate of return to cultural capital with regard to academic achievement is the same throughout the educational system. This assumption is reflected in the fact that this research estimates the (average) effect of cultural capital on different indicators of educational success based on samples of students who attend potentially very different school types (for example public or private schools) or educational tracks (for example academic or vocational tracks) (Aschaffenburg and Maas, 1997; Cheadle, 2008; De Graaf et al., 2000; DiMaggio, 1982; Dumais, 2002; Jæger, 2011; Sullivan, 2001). However, educational systems are internally stratified even at the same grade or level (Kerckhoff, 1995; Shavit and Müller, 2006) and returns to cultural capital may vary across educational levels or schooling environments characterized by different curricula, peers, and teachers.

In addition to yielding different returns *within* a national educational system, the effect of cultural capital on educational success may also differ *across* schooling systems. In particular, cultural capital may operate through different channels in selective and comprehensive educational systems. In selective educational systems, for example those found in continental Europe, students are placed in different educational tracks from an early age. In these systems the principal role of cultural capital may be to ensure entry into a prestigious educational track (for example, the *Gymnasium* track in Germany or the *Lycée Général* in France; Bourdieu and Passeron, 1990; Georg, 2004) rather than to directly promote academic achievement (in highly selective systems students within a track may have similar amounts of cultural capital, thereby limiting its value as a strategic resource). By contrast, in comprehensive educational systems, for example those found in Scandinavia, students are not tracked and the student population is highly diverse in terms of possession of cultural capital. In these systems the principal role of cultural capital may be to promote academic achievement directly by presenting an impression of academic brilliance which is rewarded by teachers. Below, we consider different channels through which cultural capital may affect academic achievement. But before doing this we present two models that predict different returns to cultural capital in high- and low-achieving schooling environments.

2.3.1. Cultural reproduction

Bourdieu argues that cultural capital is a resource which is used principally by socioeconomically advantaged groups to promote social reproduction. As a consequence, socioeconomically disadvantaged groups are assumed not to possess any cultural capital and, if they do, they are assumed not to be equally capable of benefiting from this capital. This argument implies that children from advantaged families are particularly likely to be in schooling environments that recognize and

reward cultural capital. These schooling environments are often characterized by high-SES peers, an academically oriented learning environment, high academic achievement, and only little dispersion in achievement. By contrast, children from less advantaged family backgrounds are likely to be in low-SES and low-achieving schooling environments in which there is little (appreciation of) cultural capital. Accordingly, it follows from Bourdieu that one of the reasons why children from high-SES families are more successful in the educational system than those from low-SES families is that they occupy schooling environments in which returns to cultural capital are higher.

2.3.2. Cultural mobility

DiMaggio (1982) and DiMaggio and Mohr (1985) proposes an alternative explanation. He argues that cultural capital is not possessed exclusively by those in advantaged socioeconomic positions. Rather, cultural capital may be possessed by everyone and, if possessed, it benefits everyone equally. This model implies that the rate of return to cultural capital is not higher in high-achieving schooling environments than in low-achieving ones. However, because students still need to "show off" their cultural capital in school in order to benefit from it, and because there is generally less cultural capital in low-achieving environments than in high-achieving ones, those who possess cultural capital in low-achieving environments are better able to display this capital. Consequently, the cultural mobility model makes the opposite prediction of that proposed by the cultural reproduction model: returns to cultural capital should be higher in low-achieving schooling environments than in high-achieving ones.

2.4. Hypotheses

Based on the cultural reproduction and cultural mobility models, we now propose a set of hypotheses regarding the expected returns to cultural capital in different schooling environments. Unlike previous research, we measure directly the levels of academic performance in the schooling environments in which students convert cultural capital into academic achievement. We develop our hypotheses using a simple two-way classification of the level of academic achievement and variance in achievement within schooling environments. This classification entails that schooling environments may be characterized by high or low academic achievement and by high or low variance in achievement, which leads to four modal types of schooling environments (high achievement/high variance, high achievement/low variance, low achievement/high variance, and low achievement/low variance).

According to the *cultural reproduction model*, we would expect cultural capital to yield a higher return in high-achieving schooling environments than in low-achieving ones. The reason for this expectation is that high-achieving schooling environments have higher academic standards, are inclined toward recognizing and rewarding cultural capital, and tend to be populated by high-SES students and teachers who appreciate legitimate culture. This effect may be further reinforced if the variance in academic achievement is low: high-performing students perform equally well, are more likely to share views on legitimate (as opposed to illegitimate) culture and academic brilliance, and form a more selective group with regard to socioeconomic and cultural background. The same mechanisms apply, but to a lesser extent, in schooling environments characterized by high academic achievement and high variance in achievement. Institutional factors in these environments that are associated with a high variance in achievement, for example a more socially mixed intake of high-ability students or more diverse norms regarding what is considered academic brilliance, may lead to lower returns to cultural capital because there is less agreement that cultural capital should be rewarded.

According to the *cultural mobility* model, we would expect cultural capital to yield a higher return in low-achieving schooling environments than in high-achieving ones. The argument underlying this hypothesis is that low-achieving schooling environments are characterized by little cultural capital and, if possessed, cultural capital yields a high return because there is less competition when attempting to "show off" one's cultural capital (by contrast, competition to stand out may be fierce in high-achieving environments). This is essentially DiMaggio's (1982) argument for hypothesizing that cultural capital may be a means of upward mobility for students from low-SES backgrounds who possess cultural capital. This hypothesis assumes that the appreciation of cultural capital is the same in low-achieving and high-achieving schooling environments; the difference in returns to cultural capital arises solely from compositional differences between environments in the level of, and variance in, academic, cultural, and socioeconomic resources. Differences in the variances in academic achievement may further affect returns to cultural capital. For students who possess cultural capital, returns to cultural capital would be expected to be higher in schooling environments in which both mean academic achievement and the variance in achievement is low compared to in environments in which achievement is low but the variance is high. Thus, it is easier to stand out in a schooling environment in which everybody else is (equally) low-performing compared to in an environment in which most students are low-performing but in which there are other competitors for the teacher's attention.

3. Data and variables

3.1. Data

We analyze data from three countries from the PISA (Programme for International Student Assessment) 2000 study. PISA 2000 is a large-scale comparative study which provides internationally standardized assessments of academic achievement

Table 1
Descriptive statistics.

	Mean	Standard deviation	N
Reading ability[a]	519.380	96.303	38,575
Cultural capital			
Cultural possessions[a]	4.621	1.106	37,158
Engagement in reading[a]	23.163	6.597	37,040
Cultural communication[a]	7.271	2.693	37,314
Home educational resources[a]	11.337	0.998	37,125
Controls			
Father's education[a]	4.896	1.316	36,096
Mother's education[a]	5.006	1.178	36,976
Family occupational status[a]	51.007	16.236	37,449
No. siblings[a]	1.876	1.282	37,951
Single parent family	0.147	0.354	38,575
Girl	0.496	0.500	38,575
Month of birth	6.550	3.386	38,222
Other language at home	0.058	0.233	38,575
School-level variables			
Cultural possessions[b]	−0.0002	0.366	38,575
Engagement in reading[b]	−0.0008	0.271	38,537
Cultural communication[b]	−0.002	0.284	38,575
Home educational resources[b]	−0.001	0.284	38,575
Father's education[b]	−0.005	0.367	38,565
Mother's education[b]	−0.005	0.344	38,575
Family occupational status [b]	−0.002	0.408	38,575

Note: Sample sizes: Canada (29,193), Germany (5003), and Sweden (4399).
[a] Variable is standardized within each country in the empirical analysis.
[b] Calculated from the standardized individual-level variable.

among 15-year olds (OECD, 2000). We use PISA for two reasons. First, in addition to measuring students' reading ability (our measure of academic achievement), PISA also includes variables capturing different aspects of cultural capital and socioeconomic background. This information makes PISA particularly suited for analyzing the effect of cultural capital on academic achievement (Barone, 2006; Xu and Hampden-Thompson, 2012). Second, PISA samples several students from the same school, thereby providing multilevel data with students nested within schools. As explained below, we exploit the nested data to identify latent schooling environments. We use data from PISA 2000 rather than from later PISA waves (2003, 2006, and 2009) because PISA 2000 includes information on all students' actual reading ability test scores rather than imputed values and, moreover, PISA 2000 includes the broadest array of cultural capital variables among all PISA waves.

We include three countries in the analysis: Canada, Germany, and Sweden. The reason for including three countries rather than just one is to compare returns to cultural capital in countries with different educational and social systems (DiPrete, 2002; Shavit and Müller, 2006). Germany has a highly selective educational system in which students are tracked from the fifth grade onward (around age 12). Canada and Sweden operate comprehensive educational systems in which students are not tracked until the end of compulsory school (around age 16–18). Thus, by including three countries we are able to determine if our main findings are similar across different institutional settings. We emphasize that our ambition in this paper is not to carry out a comparative analysis of the role of educational systems in shaping the returns to cultural capital. This type of analysis would require additional theory, hypotheses, and empirical analyses and is beyond the scope of the present paper. Rather, our ambition is to enhance the robustness of our results by replicating the empirical analyses using several countries (we provide information on additional robustness checks below).[1]

Our analysis sample includes 38,575 respondents nested within 1,403 schools. In order to ensure reliable measurement of schooling environments, we exclude observations from schools with less than ten observations (we lose 1,177 observations or around three percent of the total sample when imposing this restriction). Table 1 shows descriptive statistics for all variables used in the analysis.

3.2. Dependent variable

Our measure of academic achievement is the student's score on the PISA reading ability test. This test, which was designed and implemented by the OECD, measures reading ability along three sub-dimensions: retrieving information, interpreting texts, and reflection and evaluation (OECD, 2000). In the empirical analysis we use the weighted estimate of

[1] We would have liked to include the United States as this country has often been included in studies of cultural capital and educational success. Unfortunately, the sample size for the US PISA 2000 data is smaller than for the other countries and, moreover, there is a substantial amount of missing data on some of the key family background variables (OECD, 2000:191–193). Instead, we include Canada whose primary and secondary schooling system is similar to the US system and for which the sample size is the biggest among all the countries that participated in the 2000 PISA (see Table 1).

the student's reading ability calculated by the PISA team, which is considered to be a reliable measure of reading ability. In order to simplify the presentation of the empirical results, we standardize the reading ability test score within each country to have mean zero and standard deviation one.

3.3. Cultural capital

We include four indicators of cultural capital: family cultural possessions, engagement in reading, cultural communication, and home educational resources. These indicators capture different aspects of cultural capital previously identified as consequential for educational success (Aschaffenburg and Maas, 1997; Covay and Carbonaro, 2010; DiMaggio, 1982; Lareau and Weininger, 2003). The OECD has calculated indices to capture each dimension based on Item Response Theory, but we prefer simpler (and more transparent) additive indices based on the indicators also used by the OECD.[2]

Our first indicator is the index of *family cultural possessions*. This indicator measures the presence of highbrow cultural objects in the home. Specifically, using the response categories 1 (''yes'') and 0 (''no''), the respondent was asked to report whether she had the following items in her home: (1) classical literature, (2) books of poetry, and (3) works of art. A higher value on the index implies more cultural objects in the home (DiMaggio, 1982; Aschaffenburg and Maas, 1997). The internal reliability of this indicator, as evaluated by Cronbach's Alpha, is .63.

Our second indicator is the index of *engagement in reading*. This indicator measures the extent to which the respondent reads for pleasure. Specifically, using a response scale with four categories (1 = ''Strongly disagree,'' 2 = ''Disagree,'' 3 = ''Agree,'' and 4 = ''Strongly agree''), the respondent was asked how much she agrees with the following statements: (1) ''I read only if I have to,'' (2) ''Reading is one of my favorite hobbies,'' (3) ''I like talking about books with other people,'' (4) ''I find it hard to finish books,'' (5) ''I feel happy if I receive a book as a present,'' (6) ''For me, reading is a waste of time,'' (7) ''I enjoy going to a bookstore or a library,'' (8) ''I read only to get information that I need,'' and (9) ''I cannot sit still and read for more than a few minutes.'' A higher value on the index implies a higher engagement in reading (De Graaf et al., 2000; Cheung and Andersen, 2003). The internal reliability of this indicator is .91. We note that, unfortunately, information on what type of literature the respondent reads (classic literature, comic books etc.) is not available in PISA. This limitation means that our index of engagement in reading exclusively captures *engagement* in reading but not the *quality* of what is read in terms of displaying familiarity with high status cultural symbols.

Our third indicator is the index of *cultural communication*. This indicator measures the frequency of communication between the respondent and her parents on cultural and political issues. Specifically, using a five-point scale (1 = ''Never or hardly ever,'' 2 = ''A few times a year,'' 3 = ''About once a month,'' 4 = ''Several times a month,'' and 5 = ''Several times a week'') the respondent was asked how often she did the following with her parents (or guardian): (1) discussed political or social issues, (2) discussed books, films, or television programs, and (3) listened to classical music. A higher value on the index implies a higher level of cultural communication (Cheung and Andersen, 2003; Jæger, 2009). The internal reliability of this indicator is .58.

Our fourth indicator is the index of *home educational resources*. This indicator captures the availability of objects in the home that are used for educational purposes. Specifically, using the response categories 1 (''yes'') and 0 (''no''), the respondent was asked to report whether the following was available in her home: (1) a dictionary, (2) a quiet place to study, (3) a desk for study, (4) text books, and (5) the number of calculators in the home. A higher value on the index implies that more educational resources were available to the respondent (Downey, 1995; Roscigno and Ainsworth-Darnell, 1999). The internal reliability of this indicator is .42.

The correlation between the cultural capital variables ranges from .11 to .35 (all with $p < .001$). In order to facilitate easier interpretation, we standardize the cultural capital variables within each country in the empirical analysis.

3.4. Control variables

We include a set of variables to account for basic demographics and the respondent's socioeconomic background. These variables include (1) parents' level of education measured through the ISCED (International Standard Classification of Education) educational classification with six ordered categories, (2) family occupational status measured through the OECD HISEI scale, (3) number of siblings, (4) family structure (with a dummy variable for the respondent living in a single parent family), (5) month of birth (students are born in the same year, but some are older than others), (6) language spoken at home (with a dummy variable indicating if the language spoken at home is not the same as the one used in the PISA tests), and (7) the student's sex (with a dummy variable for girls) (OECD, 2000).

3.5. School-level variables

We include several variables measured at the school level to capture differences between schools in their cultural and socioeconomic composition. To capture between-school differences in cultural capital, we calculate variables which

[2] Among other things, our strategy implies that we do not imputate missing values on any of the indices when information on one of the indicators that is included in an index is missing.

summarize the mean of the four cultural capital variables (cultural possessions, engagement in reading, cultural communication, and home educational resources) across all respondents within a school. To capture differences in socioeconomic composition, we calculate school-level variables which measure mean parental education (both father and mother) and family occupational status. As explained below, we use these variables to characterize the cultural and socioeconomic composition of the different latent schooling environments in each country.

4. Analytical strategy

The aim of the empirical analysis is to investigate if returns to cultural capital vary systematically across schooling environments characterized by different levels of academic achievement and different variances in achievement. The PISA data have a two-level structure consisting of students nested within schools, which allows us to identify latent schooling environments in each country that differ with regard to students' mean academic achievement and the variance in achievement.

We employ a multilevel modeling strategy to jointly estimate the characteristics of the schooling environments in which students are nested and the effect of cultural capital on academic achievement within each environment. Instead of using traditional multilevel models which partition the variance in academic achievement into within- and between-school variance components, we use multilevel mixture models which summarize between-school differences in academic achievement by means of a small number of latent categorical groups (McLachlan and Peel, 2000; Muthén and Asparouhov, 2009). These latent categorical groups capture schooling environments that differ with regard to mean academic achievement and the variance in achievement and, building on Bourdieu's notion of subfields within the field of education, we prefer the mixture model approach to the traditional multilevel approach because we are interested in identifying *qualitatively* different schooling environments (rather than simply estimating the *quantitative* amount of variance in academic achievement that lies between schools).

In our multilevel mixture regression model the random intercept and slope of a linear regression of reading ability on cultural capital for individual i in school j are allowed to vary across the latent groups of a school-level latent class variable C with K categories (labeled c, with $c = 1,\ldots,K$). The latent class variable C is intended to capture latent schooling environments which differ with regard to academic achievement and the variance in achievement. We write

$$y_{ij}|C_{ij=c} = \beta_{0cj} + \beta_{1cj}x_{ij} + \beta_2 k_{ij} + r_{ij}, \tag{1}$$

where y is reading ability, x is the vector of cultural capital variables, k is the vector of control variables, and r is a normally distributed residual whose variance is assumed to vary across latent classes, $r_{ij} \sim N(0, \sigma_c)$. We incorporate potentially heterogeneous returns to cultural capital by allowing the effect of the cultural capital variables to vary across the different schooling environments captured by the latent class variable C. Specifically, in Eq. (1) we treat the intercept β_{0cj} and the coefficients on the cultural capital variables β_{1cj} as random effects which are allowed to vary across the latent classes of C.[3] We write

$$\beta_{0cj} = \gamma_{00c} + u_{0j}, \tag{2}$$

$$\beta_{1cj} = \gamma_{10c} + u_{1j}, \tag{3}$$

where γ_{00c} is a random intercept and γ_{10c} are random coefficients, all of which vary across levels of C, and where u_{0j} and u_{1j} are normally distributed residuals.

Our empirical analysis is divided into three steps. First, for each of the three countries we estimate a series of null models to identify the number of latent schooling environments needed to account for the between-school variance in academic achievement. In practice, we estimate Eq. (1) without any explanatory variables (i.e., leaving out the x and k variables) and gradually increase the number of latent classes until we account for all the between-school variance in academic achievement. As is convention in the literature on mixture models, we use the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC) to select the appropriate number of latent classes (McLachlan and Peel, 2000). From this analysis, we identify a number of latent schooling environments that differ with regard to mean reading ability (γ_{00c}) and the individual-level variance in reading ability (σ_c).

Second, having established the number of latent schooling environments in each country, we use the cultural capital and SES variables measured at the school level to characterize the different schooling environments. Substantively, we are interested in analyzing the extent to which high- and low-achieving schooling environment differ with regard to the composition of cultural capital and student SES. In order to carry out this analysis, we estimate the null model (i.e., Eq. (1) without the x and k variables) and allow for membership of the different latent classes to depend on the school-level cultural capital and SES variables. We write

$$P(C_j = c) = \frac{\exp(a_c + b_c\bar{z}_j)}{\sum_{s=1}^{K}\exp(a_s + b_s\bar{z}_j)} \tag{4}$$

where $\bar{z}$ is the vector of school-level variables and a is a constant. The model in Eq. (4) is a logit model in which the probability that the respondent belongs to a high- rather than a low-achieving schooling environment depends on the cultural

[3] To keep the model feasible, and because we have no explicit interest in these variables, we treat the effects of the control variables as fixed effects that do not vary across latent classes.

and socioeconomic composition of the school in which the respondent is located. The vector of regression coefficients *b* captures the effect of the school-level variables on the likelihood of belonging to the high-achieving environment relative to the low-achieving one (the reference group).

Finally, in our main analysis we estimate the multilevel mixture model described in Eq. (1) which includes the cultural capital and the control variables. For each of the cultural capital variables, we test whether the effect of this variable varies across the latent schooling environments (as hypothesized by the cultural reproduction and cultural mobility models) or whether the effect is the same in each environment. We perform the analysis for each country separately and estimate all models by means of maximum likelihood using the *M*plus software.

5. Results

We present results from the empirical analysis in three sections. In the first section we present results from the baseline models for the three countries under study. Here, we identify the number of latent schooling environments needed to account for the between-school variance in academic achievement in each country. In the second section we characterize each schooling environment with regard to cultural capital and socioeconomic characteristics. Finally, in the third section we test for heterogeneous returns to cultural capital across high- and low-achieving environments and evaluate our results in relation to the cultural reproduction and cultural mobility models.

Table 2 shows fit statistics for null models estimated in each of the three countries. The table summarizes the values of the BIC and AIC for models which use 2–4 latent classes to account for the between-school variance in reading ability test scores. Lower values of the BIC and AIC imply better fit. The main conclusion from Table 2 is that, for all countries, a model with two latent classes yields a considerably better fit to the data compared to a model with only one class (i.e., a model assuming no heterogeneity in schooling environments). However, in all countries adding a third latent class model leads to only a minor improvement in model fit and, consequently, our results suggest that we need only two latent classes to account for between-school heterogeneity in reading ability.[4] Two potential reasons why we need only two classes are that, first, we allow each latent class to have both its own mean and variance in reading ability (thus, our modeling strategy is quite flexible), and, second, in most countries there is only a limited number of schools from which to identify the latent schooling environments (thus, our ability to capture fine-grained differences in schooling environments is limited by the data).

Table 3 presents results from the two-class null models in each of the three countries under study. For each country, the table distinguishes two latent schooling environments: a high-achieving environment and a low-achieving environment. We distinguish each environment on the basis of three parameters: (1) mean (standardized) reading ability for respondents belonging to this environment; (2) the variance in (standardized) reading ability; and (3) the proportion of respondents that belongs to each environment. The upper part of Table 3 shows our empirical estimates of these parameters, while the lower part shows results from null models in which, as shown in Eq. (4), we allow the probability that students belong to the high-achieving schooling environment to depend on school-level cultural capital and SES. Below, we discuss results from these models.

Results in the upper part of Table 3 show two clear patterns. First, in all three countries respondents in the high-achieving schooling environment exhibit above-mean reading ability, while those in the low-achieving environment exhibit below-mean ability (reading ability is standardized, so mean ability is zero and the numbers in Table 3 are fractions of a standard deviation). Second, in all three countries we find that the variance in reading ability is at least twice as large in the low-achieving environment compared to in the high-achieving environment. Consequently, not only do respondents in high-achieving environments on average exhibit significantly higher reading ability compared to those in low-achieving environments, the dispersion in reading ability is also considerably smaller in high-achieving environments. These schooling environments match two out of our four proposed combinations of academic achievement and variance in achievement: a high- (and similarly-) performing environment and a low- (and dissimilarly-) performing environment.

The lower part of Table 3 shows results from regressions of school-level cultural capital and SES on the likelihood of belonging to the high-achieving rather than the low-achieving environment. The idea in this analysis is to characterize the two schooling environments in terms of cultural and socioeconomic composition. In general, we find that, compared to those in the low-achieving schooling environment, students in the high-achieving schooling environment belong to schools in which students on average have more cultural capital and come from more privileged socioeconomic backgrounds. Although not all of the school-level cultural capital and SES variables are significant (especially in Germany and Sweden where sample sizes are smaller than in Canada), these results are in line with our expectation that the high-achieving environments tend to be populated by students from privileged backgrounds. Our two competing hypotheses argue that returns to cultural capital vary systematically across these schooling environments, and we now turn to this question.

The cultural reproduction model predicts that the effect of cultural capital will be higher in the high-achieving (and low-variance) environment than in the low-achieving (and high-variance) environment. By contrast, the cultural mobility model predicts that the effect of cultural capital will be higher in the low-achieving environment than in the high-achieving

[4] Even in Canada, in which we have close to 30,000 respondents nested within more than 1000 schools, adding a third latent class does not change our results in any substantive way. Here, a third latent class captures a very small, high-performing schooling environment (to which less than .1 percent of the respondents belong). We observe the same pattern in Germany and Sweden.

Table 2
Summary of results from baseline multilevel mixture models.

Latent classes		Canada	Germany	Sweden
1	BIC	82,808	14,213	12,499
	AIC	82,792	14,200	12,486
2	BIC	82,582	14,118	12,420
	AIC	82,540	14,085	12,388
3	BIC	82,448	14,113	12,411
	AIC	82,381	14,061	12,360
4	BIC	82,459	14,120	12,427
	AIC	82,368	14,055	12,363

Note: BIC = Bayesian Information Criterion, AIC = Akaike Information Criterion.

Table 3
Mean reading ability and variance by schooling environment and country. School-level predictors of school being in high-achieving environment.

	Canada		Germany		Sweden	
	High	Low	High	Low	High	Low
Schooling environment						
Mean reading ability	.245 (.048)***	−.146 (.026)***	.355 (.081)***	−.294 (.092)**	.255 (.130)*	−.444 (.233)*
Residual variance	.535 (.052)***	1.220 (.052)***	.492 (.067)***	1.231 (.097)***	.634 (.150)***	1.327 (.150)***
Percentage of students	.37	.63	.45	.55	.63	.37
ICC	.157		.517		.074	
Log-likelihood	−41,265		−7,037		−6,189	
N students	29,173		5003		4399	
N schools	1,041		212		150	
Predictors of high vs. low environment						
Cultural possessions	.846 (.233)***		−.049 (1.026)		.470 (.488)	
Engagement in reading	1.747 (.259)***		3.188 (.802)***		−1.197 (.339)***	
Cultural communication	−.052 (.266)		−.119 (1.020)		−.478 (.362)	
Home educational resources	.912 (.207)***		2.708 (.889)**		1.628 (.558)**	
Father's education	.514 (.257)*		3.537 (.819)***		1.357 (.630)*	
Mother's education	.276 (.275)		−.394 (.937)		1.352 (.387)***	
Family occupational status	1.283 (.226)***		2.954 (1.057)*		.724 (.572)	

Note: Estimates in lower panel are log-odds estimates with standard errors in parenthesis.
* $p < .05$
** $p < .01$.
*** $p < .001$.

Table 4
Results for likelihood ratio tests for random coefficients on cultural capital variables.

	Canada	Germany	Sweden
Cultural possessions		*	
Engagement in reading	*	#	**
Cultural communication	*		#
Home educational resources	**		*

Note: Likelihood ratio tests are based on Satorra–Bentler scaled Chi-Squares. Models also include all the control variables.
* $p < .05$
# $p < 0.10$.
** $p < .01$.
*** $p < .001$.

environment. We now run the multilevel mixture model shown in Eq. (1) in each country and, for each of the cultural capital variables, we use likelihood ratio tests to determine whether the effect of this variable on academic achievement varies in a statistically significant way across the high- and low-achieving schooling environments.[5] Table 4 summarizes results.

Table 4 shows that the effect of cultural capital on reading ability varies in a statistically significant way across schooling environments in 8 out of 12 cases (given the comparatively low number of schools at level 2 and the conservative testing

[5] Our testing procedure, which uses likelihood-ratio tests, is identical to that usually used to test for random coefficients in traditional multilevel models. The only difference is that, in the context of mixture models, we use Satorra–Bentler (SB) corrected Chi-squares which correct for potential non-normality in the distribution of dependent variable (Satorra, 2000). The SB corrected Chi-squares lead to more conservative tests than the usual approach.

Table 5
Results from multilevel mixture models of reading ability. Parameter estimates with standard errors in parenthesis.

	Canada		Germany		Sweden	
	High	Low	High	Low	High	Low
Schooling environment						
Cultural possessions	.019 (.006)**	–[a]	−.050 (.028)	.059 (.046)	.040 (.015)*	–[a]
Engagement in reading	.316 (.008)***	.389 (.019)***	.154 (.042)***	.273 (.056)***	.290 (.034)***	.396 (.046)***
Cultural communication	.039 (.010)***	.101 (.024)***	.040 (.012)**	–[a]	.111 (.025)***	.029 (.052)
Home educational resources	−.012 (.015)	.098 (.020)***	.049 (.016)**	–[a]	−.028 (.045)	.095 (.038)*
Schooling environment						
Mean achievement	.148 (.021)***	−.043 (.027)	.090 (.049)	.066 (.061)	.319 (0.105)**	−.131 (.142)
Residual variance	.433 (.024)***	1.086 (.086)***	.231 (.081)**	.653 (.165)***	.395 (.096)***	.887 (.180)***
Percentage of students	.70	.30	.59	.41	.61	.39
Log-Likelihood	−30,380		−3762		−4218	
N students	25,061		3660		3541	

Note: Models also include all the control variables.
* $p < .05$
** $p < .01$.
*** $p < .001$.
[a] Same effect as in high-achieving environment.

method, we also include tests which are significant at $p < .10$). These results suggest that the effects of different aspects of cultural capital on academic achievement vary across schooling environments, as hypothesized by the cultural reproduction and cultural mobility models. Table 4, however, does not provide any information on how the effect of cultural capital varies across schooling environments.

Table 5 summarizes results from multilevel mixture regressions for the three countries under study. The upper part of the table shows parameter estimates for the effect of the (standardized) cultural capital variables on (standardized) reading ability. Note that Table 5 shows two estimates for the cultural capital variables whose effects vary across the high- and low-achieving schooling environment. The lower part of the table also summarizes estimates of mean reading ability and the variance in reading ability in each schooling environment after we include the cultural capital and the control variables. Table 5 shows three interesting results.

First, we find that almost all of the cultural capital variables have a positive effect on reading ability in the three countries under study. This result fits previous research showing that cultural capital affects academic achievement over and above other family background factors. Similar to previous research, we also find that the variable which measures cultural possessions, our indicator of legitimate culture, is the least important (both in terms of significance and effect size) among our four cultural capital variables (De Graaf et al., 2000; Barone, 2006; Xu and Hampden-Thompson, 2012).

Second, in all cases except one in which the effect of cultural capital varies across schooling environments, we find that cultural capital has a stronger effect on academic achievement in the low-achieving schooling environment than in the high-achieving one. The only exception to this pattern is the effect of cultural communication in Sweden, which is significant and positive in the high-achieving schooling environment but not in the low-achieving one. In some cases, the positive effect of cultural capital on reading ability exists only in the low-achieving environment (for example, the effect of home educational resources in Canada and Sweden), while in other cases the positive effect exists in both schooling environments but is stronger in the low-achieving environment (for example, the effect of engagement in reading in all countries). These results fit the idea in the cultural mobility model that, because low-achieving schooling environments tend to be populated by students who possess only little cultural capital, children who do possess cultural capital in these environments face less competition and are better able to "show off" their cultural capital to impress teachers. Moreover, this result holds even though the variance in academic achievement is higher in the low-achieving schooling environment than in the high-achieving one (we hypothesized that returns to cultural capital would be highest in low-achieving and low-variance environments, but we did not identify this type of schooling environment empirically in any of our three countries). In sum, our empirical results provide an institutional explanation of previous findings that returns to cultural capital are higher for low-SES students than for high-SES students (Aschaffenburg and Maas, 1997; DiMaggio, 1982; Xu and Hampden-Thompson, 2012) because we show that the schooling environments typically occupied by low-SES students yield higher returns to cultural capital.[6]

Third, we find that including the cultural capital and control variables accounts for some (but not a lot) of the within-environment differences in reading ability, the variance in reading ability, and the proportion of students belonging to each environment (compare estimates from Tables 3 and 5). Consequently, our observed variables account for only a minor part of the total within-environment differences in academic achievement.

[6] We focus on three countries in this paper but, in order to assess the robustness of our findings, we have also carried out the empirical analyses in eight other countries in PISA 2000 that resemble the three countries under study (the countries considered are Finland, Norway, Denmark, France, Spain, Austria, the United Kingdom, and Australia). With a few exceptions, results from these countries are similar to those reported in the paper (further details available upon request).

6. Discussion

This paper tests whether returns to cultural capital differ across schooling environments characterized by high and low academic achievement, high and low variance in achievement, and by different socioeconomic and cultural resources. The motivations for our analysis are Bourdieu's contention that returns to cultural capital may differ across subfields within the field of education and previous empirical evidence that returns to cultural capital are higher for low-SES students than for high-SES ones. Our theoretical framework draws on the cultural reproduction and cultural mobility models which make different assumptions regarding the value of cultural capital in different schooling contexts. Our empirical analysis uses data from three countries from the PISA 2000 study.

The main conclusion from our analysis is that cultural capital has a positive effect on academic achievement and, furthermore, that the positive effect of cultural capital tends to be stronger in low-achieving (and high-variance) schooling environments than in high-achieving (and low-variance) ones. Except for one case, our results hold for four indicators of cultural capital and in all three countries under study. Substantively, our results mostly support the cultural mobility model which argues that cultural capital has a higher return in low-achieving schooling environments in which there is less competition for the teacher's attention. By contrast, returns to cultural capital are lower in high achieving (and low-variance) schooling environments because students in these environments on average possess much more cultural capital and are eager to "show off" their cultural capital to impress teachers.

Two limitations in our analysis and several suggestions for future research should be highlighted. First, the schooling environments which we identify are based solely on between-school variance in reading ability test scores. This variance arises from differences between schools in, for example, economic resources and teacher quality. We do not measure these differences directly and, as a consequence, we are unable to provide a qualitative description of the many dimensions along which high- and low-achieving environments differ. For example, it would be extremely useful to include information on teachers' evaluations of students' academic ability in order to analyze if modes of evaluation differ systematically across schooling environments. We do, however, show that students in schools which belong to the high-achieving environments on average possess more cultural capital and come from more advantaged socioeconomic backgrounds than those in the low-achieving environments. Future research should provide a richer characterization of different schooling environments and the ways in which they facilitate high or low returns to cultural capital.

Second, although we account for compositional differences in students' socioeconomic characteristics, we do not explicitly model selection into the high- and low-achieving schooling environments based on students' individual characteristics. Consequently, our results might to some extent reflect that high-SES students are more likely to be in high-achieving schooling environments than in low-achieving environments based on individual characteristics which we do not observe in the PISA data. However, given that our latent schooling environments are broadly defined, we do not expect bias from selection to be very strong.

In spite of these empirical limitations, we think that the main contribution of this paper is to demonstrate that returns to cultural capital differ systematically across schooling environments – or what Bourdieu labels subfields – within the field of education. This finding supports the idea that we should pay explicit attention to the institutional contexts in which cultural capital is converted into educational success. Bourdieu also made this point, but our findings for three countries (and results from other countries not reported in this paper) suggest that the predictions of the cultural mobility rather than cultural reproduction model are more consistent with the empirical results. However, more research, and in particular research which explicitly tests for systematic differences across countries in the effect of cultural capital on educational success, is needed to fully understand the ways in which cultural capital contributes to the process of social reproduction. We hope that our findings will stimulate research which explores these issues.

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