What Type of Cultural Capital Matters?

The Differential Impact of General and Specific Cultural Capital on Students' Likelihood to Undermatch[1]

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Cultural capital has been used to tell competing stories of class reproduction and mobility in education. I argue that in order to reconcile these two perspectives it is important to consider how different types of cultural capitals impact educational processes typically marked by inequality. Within the field of sociology, cultural capital is conceptualized as knowledge, information, and know-how that facilitate interaction with social institutions. While ample empirical research has examined how cultural capital matters for elementary and secondary educational outcomes (Cheadle 2008; Covay and Carbonaro 2010; DiMaggio and Mohr 1985; Dumais 2006; Farkas, Grobe, Sheehan, and Shuan 1990; Jaeger 2009; Kaufman and Gabler 2004; Lareau 2011; Lee and Bowen 2006; Teachman 1987), there is limited research focusing on cultural capital's possible role in the higher education transition (Aschaffenburg and Maas 1997; Dumais and Ward 2010; Persell, Catsambis, and Cookson 1992) and even less focusing on cultural capital and the higher education choice (McDonough 1997). Focusing on student's postsecondary choices, which more and more students will experience as the college-for-all agenda continues, is crucially important.

The phenomenon of undermatching represents an important arena of inequality within the higher education choice process. Undermatching occurs when a student attends a postsecondary institution with lower selectivity than those to which she or he could have been admitted. Recently, scholars have devoted more attention to undermatching—drawing our attention to its unequally disadvantageous effects—yet many questions remain unanswered (Bowen, Chingos, and McPherson 2009; Roderick, Nagaoka, Coca, and Moeller 2008; Smith, Pender, and Howell 2012). Education researchers have recognized that college information is important and also that lower class students are more likely to lack this information, but they have not theorized a relationship between the two. Undermatching is an area of educational inequality where cultural

capital is likely to play an especially important role in either the reproduction of inequality or opportunity of mobility because of both the specialized knowledge necessary in this process, and the relatively recent college-for-all agenda that is pushing students into this arena who experience it as uncharted territory.

Previous research on the relationship between cultural capital and educational inequality has been mixed. This is largely due to the theorized relationship between cultural capital and class. On the one hand, some scholars believe cultural capital is a classed resource and thus tell a story of social reproduction (Bourdieu 1977; Bourdieu and Passeron 1990). On the other, some scholars say it is a process and thus tell be a story of mobility (Aschaffenburg and Maas 1997; De Graaf, De Graaf, and Kraaykamp 2000; DiMaggio 1982; DiMaggio and Mohr 1985). I argue that there are two different types of cultural capital that may be tied to class in different ways—thus sometimes reproducing inequalities and sometimes providing opportunities for mobility. In addition, this study adds to theories of mobility by arguing that this process is heterogeneous and may be moderated by one's social class position.

Using a nationally representative sample from the Educational Longitudinal Survey (ELS), I study the impact of two different types of cultural capital on undermatching. By focusing on inequality in undermatching, I contribute to previous research in three ways. Initially, I demonstrate the noteworthy impact of cultural capital on students' likelihood to undermatch. Students with more cultural capital are less likely to undermatch. More importantly, I demonstrate the different roles of two types of cultural capital in educational inequality, through class mediation and moderation. I demonstrate that one type of cultural capital that has previously established positive impacts on educational achievement, which I coin general cultural capital, explains some class gaps in postsecondary matching. This type of cultural capital

serves to reproduce the unequal class system. Another type of cultural capital specific to the college application process, which I coin college-specific cultural capital, appears to enable mobility. Specific cultural capital is beneficial to all class groups, whereas the major benefit of general cultural capital is confined to the middle classes. Finally, the key contribution of this study is to extend the cumulative understanding of how cultural capital works. I provide empirical support for the incorporation of theoretically informed variation in cultural capital into studies of educational inequality.

In the following review of the literature, I describe cultural capital's role in maintaining or disrupting patterns of inequality within the educational system. I also address the continuing significance of research on undermatching and describe how cultural capital will likely bear upon students' odds of undermatching.

LITERATURE REVIEW

Undermatching

Prior research has detailed the prevalence of undermatching (Bowen et al. 2009; Roderick et al. 2008; Smith et al. 2012), the concentration of undermatching amongst groups disadvantaged by race/ethnicity and class (Hearn 1991; Hill and Winston 2010; Roderick et al. 2008; Bowen et al. 2009), and the breadth of undermatching at all academic performance levels (Roderick et al. 2008; Smith et al. 2012). Nationally representative research by the College Board claims 40 percent of students undermatch (Smith et al. 2012).

The number of students undermatching is particularly remarkable once the negative outcomes associated with undermatching are considered. Bowen et al. (2009) found that when comparing students with similar academic credentials those who matched had shorter time-to-degree and higher probabilities of graduating than those who undermatched. Literature on

college selectivity reinforces these findings. Highly selective colleges tend to have significantly higher graduation rates (Bound et al. 2010; Horn and Carroll 2006; Alon and Tienda 2005) and shorter time-to-degree (Bound et al. 2010) than colleges with less selectivity. Completion rate is important because the rewards one receives after graduation, such as employment and compensation, are higher for students who have a completed degree, even compared to students who have three years of higher education, indicating a threshold effect (Arum and Hout 1998; Kane and Rouse 1995). The longer-time-to degree at lower selectivity schools increases the financial burden on students and decreases the overall time spent in the labor market, decreasing lifetime earnings.

Unfortunately, students who are at the greatest risk to undermatch are also those students who would benefit the most from matching. Research demonstrates that attending selective schools pays off more in earnings after college for low-income students than for their middle or upper-income counterparts (Dale and Krueger 2002). However, students from disadvantaged family backgrounds are less likely to enter higher education and more selective institutions in particular (Kim and Schneider 2005; Lareau and Weininger 2008; McDonough 1997). It is therefore especially important to study undermatching amongst students of low-income.

College Knowledge

One theoretical framework that education scholars have drawn upon, although largely unknowingly, is cultural capital. They have attempted to understand the undermatching phenomenon among low-income students by acknowledging the degree of prior knowledge necessary not only to apply to college, but also to choose, and to match appropriately to a specific college. Early qualitative research introduced the idea that a lack of knowledge and guidance often act as a barrier to success in higher education, both in relation to undermatching

(Roderick et al. 2008) and more broadly (Lareau 2011; McDonough 1997). Lack of information, lack of forward planning for college, and lack of encouragement seem to characterize first generation college-goers and low-income students' selection processes more than other groups (Bloom 2007; Cabrera and LaNasa 2001; Cabrera and LaNasa 2000; McDonough 1997). At the other end of the spectrum, upper class parents are able to provide their children with what has been referred to as a "college-going habitus" that entails always knowing and expecting to go to college, which provides students with advantages in the college application and attendance process (Grodsky and Riegle-Crumb 2010). Quite simply, students from disadvantaged backgrounds do not possess the classed knowledge, or cultural capital, to navigate the college selection process and accurately distinguish between postsecondary institutions.

Some studies have specified the types of knowledge that may be beneficial; these ranged from knowing what steps to take in preparation for higher education, such as course selection and SAT practice (Perna 2000; Plank and Jordan 2001; Roderick, Coca, and Nagaoka 2011) or participating in extracurricular activities (Kaufamn and Gabler 2004), to awareness of college requirements (Plank and Jordan 2001) and knowledge of the application and financial aid process (Roderick, Coca, and Nagaoka 2011). For example, college costs influence lower-income student choices through perceptions and expectations of the affordability of college, as well as confusion surrounding financial application procedures (Paulsen and St. John 2002; Roderick et al. 2008). For example, budget constraints play a role in predicting which students will forego college applications altogether or will apply to non-selective four-year and two year institutions partly because of the perception of lower price tags attached to these less selective institutions, although more selective institutions would often cost low-income and high-achieving students less, owing to generous financial aid (Dillon and Smith 2009; Hoxby 2012;

Roderick et al. 2008). The more students and parents know about college in general and more specifically about financial aid, the likelihood of enrolling increases (Kim and Schneider 2005; Plank and Jordan 2001).

Parents can be a vital resource in the college application process, not only by ensuring financial security, but also by providing information and support throughout the process (Lareau 2011; McDonough 1997). Past research recognizes that students with more involved parents are more likely to have successful higher education application and enrollment experiences (Dumais and Ward 2009; Lareau and Weininger 2008; McDonough 1997). These studies indicate that cultural capital may be a significant driving force in lower socioeconomic status students' college choices.

Theoretical Contribution: Variation in Cultural Capital

Most research has performed one-dimensional studies of cultural capital. Little research has explicitly recognized variation in cultural capital (see Laureau and Weininger 2003 and Sullivan 2001 for an overview of how and why researchers have chosen to simplify studies of cultural capital; see Kraaykamp and van Eijk 2010 for one study that accounts for variation based on Bourdieu's states of cultural capital).

Two studies of particular importance here recognize the possibility of varying impacts on student outcomes depending on when in the life course and how cultural capital is acquired (Aschaffenburg and Maas 1997; Tramonte and Williams 2010). Aschaffenburg and Maas (1997) demonstrate that variation in the time of acquisition of cultural capital affects its effectiveness. They claim that the importance of cultural capital acquired early in life (operationalized as participation in cultural classes) declines over time in comparison to later cultural capital (Aschaffenburg and Maas 1997). Since "each transition takes place in a new competitive arena…

early deficits decisive in previous 'competitions' becomes less important over time" (Aschaffenburg and Maas 1997:584). Here, I argue, Aschaffenburg and Maas have varied cultural capital by when it is acquired, earlier or later. Tramonte and Williams (2010) also describe variation in how cultural capital is transmitted to children. They differentiate between static cultural capital, a relatively constant possession and expression of high culture on the part of parents, and relational cultural capital, which includes resources and activities that are actively expressed in the relationships between parents and children.

I propose that variation in the type of cultural capital students possess will also advance our understanding of the role cultural capital plays in inequality of student educational outcomes. Cultural capital specific to the secondary-postsecondary turning point in one's educational career will likely have a different impact than cultural capital that is less focused and may not be activated during college choice.

Previous research posits that cultural capital is most influential at critical junctures in students' educational lives (Dumais and Ward 2009) and in high socio-economic status environments where social actors recognize and reward high cultural behaviors and knowledge (Jaeger 2011). The college choice process is both a turning point and high status environment, where class position may play a decisive role in determining life outcomes. I develop the concept of college-specific cultural capital (or simply specific cultural capital) to refer to this type of cultural capital.

My concept of general cultural capital is an alternative type of cultural capital that references cultural resources acquired throughout a child's life that are not specific to any particular turning point, but induce an affinity for, understanding of, and comfort with the education system. This type of cultural capital may be acquired through parent-child discussions

of school, parent attentiveness to school-related activities, or parental value for educational materials, and be demonstrated by student plans for higher education.

Based on previous understandings of the role of cultural capital these different types may have varied impacts on inequality. Cultural capital was initially theorized to tell a story of the reproduction of class inequality (Bourdieu 1977; Bourdieu and Passeron 1990). However, since then, cultural capital has been used to tell stories of cultural mobility as well as reproduction (Aschaffenburg and Maas 1997; De Graaf, De Graaf, and Kraaykamp 2000; DiMaggio 1982; DiMaggio and Mohr 1985).

Reproduction

Bourdieu's theory of cultural capital has played a key role in the sociological understanding social inequality in education. The concept of cultural capital has been used as a tool to illustrate that the cultural norms, values, practices, and knowledge of the most powerful social classes are used as criteria of evaluation, imposed upon the rest of society partly through an intricate education system (Bourdieu 1977; Bourdieu and Passeron 1990). These cultural resources are thought to function like other types of capital, in that their scarcity increases their value. Cultural capital enables individuals and families with knowledge of institutionalized high-status culture (attitudes, preferences, formal knowledge, behaviors, goods, and credentials) to exclude others who lack appropriate cultural capital from advantaged social positions or high-status groups (Lamont and Lareau 1988). These various cultural resources may be transmitted from one generation to the next within the family, thereby perpetuating inequality (Lareau and Weininger 2003).

Cultural capital plays a key role in Bourdieu's theory of cultural reproduction, which posits that the education system serves to maintain the link between class of origin and future

class position (Bourdieu and Passeron 1990). This occurs because the education system presupposes and rewards the possession of cultural capital, that advantaged students possess and disadvantaged students lack. The cultural capital that students lack is not explicitly taught within the education system, but its possession is assumed. The education system recognizes and rewards cultural capital. As a result, reproduction theorists claim, initial differences in cultural capital are not equalized over the educational career, but rather exacerbated. This framework assumes that early childhood cultural capital is most influential. Since cultural capital is embedded in habitus it is difficult to consciously acquire and use effectively. Educational returns to cultural capital are then assumed to be higher for children from advantaged backgrounds because they have more resources and use these resources effectively in a field that is receptive to them, education.

Mobility

A conflicting theory by DiMaggio argues that cultural capital can serve to enable class mobility. Contrary to Bourdieu, he describes the relationship between status and class as relatively loose (DiMaggio 1982; DiMaggio and Mohr 1985). Since status boundaries are amorphous, status becomes less a position occupied by individuals and more a cultural process (DiMaggio 1982: 190; DiMaggio and Mohr 1985: 1235). DiMaggio conceives of cultural capital not as inhering in status group membership, but as resulting from status culture participation. This would explain how cultural capital could influence educational performance and attainment independent of the socioeconomic position of students' parents (Cheadle 2008; DiMaggio and Mohr 1985).

Furthermore, since DiMaggio's research indicates that cultural capital is not as strongly heritable as Bourdieu claims, his model assumes that it can be acquired throughout the life

course (1982). Appropriation of cultural capital is not stringently confined to the upper classes, nor is its benefits. Contrary to Bourdieu, DiMaggio claims that cultural capital benefits all children, although since disadvantaged students may invest more heavily in cultural capital their returns may be relatively higher (DiMaggio and Mohr 1985). Other research demonstrates that both upper and lower class children can benefit from cultural capital (Lee and Bowen 2006: 212; De Graaf, De Graaf, and Kraaykamp (2000).

Although DiMaggio describes that lower class students may invest more in cultural capital acquisition, which may result in greater returns for these students, he does not fully explain why some students who may not have invested heavily in cultural capital acquisition may still benefit more than students from other classes, leaving his model of mobility under theorized. I extend DiMaggio's theory of mobility to include the concept of resource substitution. Resource substitution, most popularly employed by sociologists focusing on health outcomes (Mirowsky and Ross 2006; Mirowsky, Ross, and Reynolds 2000; Ross and Mirowsky 1989), posits that the effect of having a specific resource is greater for individuals who have fewer alternative resources. Individuals with a plethora of resources can easily draw upon multiple resources to reach a goal, and therefore substitute a number of other resources if one resource, such as cultural capital, is lacking.

For example, in relation to cultural capital and class position, if students from upper-class backgrounds do not have high levels of cultural capital they can easily substitute social capital or economic capital, drawing on knowledge that their friends have or hiring others who may possess the necessary cultural capital. Students from less-educated backgrounds have fewer resources; therefore if they can gain access to one resource, like cultural capital, it makes a significant impact on their goal attainment process. The concept of resource substitution

demonstrates that upper class families often have multiple routes to goal attainment, whereas lower classes often have limited, if any, routes the attainment of certain goals.

Present Study

These conflicting understandings of the role of cultural capital further point to the potential for variation in cultural capital that may result in differential effects of each type of cultural capital for various class groups. This research teases out these differential effects and elucidates the relationship between parental class and cultural capital among students choosing colleges. Below I describe the theoretical justification for each of my hypotheses.

Bourdieu aptly hypothesizes that upper classes will likely have more cultural capital. Since cultural capital is conceptualized as a resource based on knowledge of the education system it is predictable that individuals from the upper classes, who have likely had more experience with the system of higher education will also have more general and specific cultural capital.

> *Hypothesis 1: Upper classes will have higher levels of both general and specific cultural capitals.*

Previous research indicates that cultural capital is likely to have a positive impact on one's propensity to match since it has a generally positive influence on educational achievement and attainment in elementary and secondary education (Aschaffenburg and Maas 1997; De Graaf et al. 2000; DiMaggio 1982; DiMaggio and Mohr 1985; Dumais 2002; Cheadle 2008; Covay and Carbonaro 2010; Farkas et al. 1990; Kalmijn and Kraaykamp 1996; Roscigno and Ainsworth-Darnell 1999; Sullivan 2001; Teachman 1987). Therefore, I expect both general and specific cultural capitals to benefit students.

> *Hypothesis 2: Both general and specific cultural capitals will decrease students' odds of undermatching.*

Although general cultural capital and specific cultural capital will both likely have a positive effect on undermatching, they are distinct from one another. As my argument above described, general and specific cultural capitals are different types of cultural capital and therefore will have effects on undermatching that are independent of each other.

Hypothesis 3: General cultural capital and specific cultural capital will have separate effects on undermatching.

General cultural capital and specific cultural capital will likely mediate the relationship between class positions and undermatching differently. Cultural capital is often thought of as a classed resource, unevenly distributed and concentrated among the upper classes. The lower classes have less access to and are unable to activate cultural capital. However, some cultural capital may not be inherently tied to class (as DiMaggio argues). Therefore, one type of cultural capital may be more evenly distributed while the other may be more classed. In line with Bourdieu's conception of cultural capital, general cultural capital is likely more class dependent than specific cultural capital since it is based on deeply embedded cultural capital: educational resources, student expectations, parent-child interactions related to school, and parental interaction with schools. In contrast, college-specific cultural capital is based on parent-child interactions specific to college. These interactions are often more temporally confined (to a shorter time period leading up to college enrollment) and therefore have the potential to be acquired through targeted interventions by other social actors. College-specific cultural capital may be acquired later in life and therefore will depend less on parental class position than general cultural capital.

Hypothesis 4: General cultural capital will mediate the effect of class.

Hypothesis 5: Specific cultural capital will mediate the effect of class less than general cultural capital.

Class may also moderate the effect of general cultural capital differently than specific cultural capital. Although Bourdieu and DiMaggio both theorize the relationship between class and cultural capital, resource substitution provides a vital contribution. If general cultural capital were more closely tied to class than specific cultural capital (as posited above in Hypothesis 2), then it would likely be more susceptible to moderating effects than specific cultural capital. I propose that general cultural capital will likely have little influence on undermatching at the upper and lower ends of the class spectrum. Since general cultural capital is more durable and ingrained and less available to the lower classes, these classes will be unlikely to benefit from it since they will not be able to activate the cultural capital they have in a productive way. However, those classes who are able to gain a modicum of general cultural capital, in the middle of the class spectrum, will benefit greatly. Whereas, among the highest classes resource substitution would keep cultural capital from playing a decisive role in students' likelihood to undermatch since they have multiple resources at their disposal.

Specific cultural capital is likely to be more equally beneficial across class groups, since it is more easily acquired. General cultural capital is not easily acquired because it is inherited slowly from primary socialization onward. It is more ingrained and durable. Therefore those who do not have general cultural capital, or have been socialized in ways that do not inline with institutional values, will have a difficult time embodying the traits and behaviors represented in cultural capital and demanded by high-status institutions. Cultural capital that is more easily acquired is also more easily activated since it does not entail the complex, unconscious preferences that may be more present in general cultural capital. Therefore, distinguishing between upper class and lower class employment of specific cultural capital would be more

difficult, making differential preferences for the upper classes more difficult, enabling equal benefits across groups.

Hypothesis 6: Class position will moderate the effect of general cultural capital.

Hypothesis 7: Class position will not moderate the effect of specific cultural capital.

Specific cultural capital may serve as an important resource for those students with low levels of general cultural capital. Bourdieu would assume that students with little to no general cultural capital would also have limited specific cultural capital. Mobility theory would not assume that the two types of capital are inherently connected. By employing the concept of resource substitution I propose that students may still benefit from specific if they have low levels of general cultural capital. In fact, these students with limited general cultural capital resources would be the most likely to benefit from specific cultural capital because they are lacking other resources to achieve their goals, making this resource vitally important.

Hypothesis 8: General cultural capital will moderate the effect of specific cultural capital.

By testing these propositions, this research seeks to extend understanding of the influence of cultural capital by differentiating between class groups' relationships to general cultural capital and college-specific cultural capital, while also describing how the influence these types of cultural capital have on undermatching varies by students' class positions.

METHODS

Sample

This study uses data from the Educational Longitudinal Survey (ELS) of 2002, conducted on behalf of the National Center for Education Statistics by the Research Triangle Institute. This is a nationally representative sample of young people designed to monitor students during their transition from high school to postsecondary education and/or the work force. ELS collected

information from 750 schools and over 16,000 students. Students were first surveyed in 10th grade (2002), with follow-ups when the students were in 12th grade (2004), then again two and eight years later (2006 and 2012). Surveys after 2002 surveyed extra students to account for students who left the sample because of school transfers. I use data from the first survey and first follow-up, while the students are still in high school. Much of this information, such as student GPA, ACT/SAT scores, and college attended, is from the restricted version of ELS.

The analyses are conditional on college attendance and entrance exam completion. The literature has varied definitions of undermatching related to college attendance. Some studies include students who fail to attend college, but have college aspirations as undermatchers (Roderick et al. 2008), while other studies only include students who enroll in four-year post-secondary education institutions (Bowen et al. 2009), and still others include two-year college attendees as potential undermatchers (Smith et al. 2012). I base this research on the premise that when students choose to forgo college altogether this is a different phenomenon than undermatching. Deciding one does not want to or cannot attend college is not equivalent to attending a college that is inappropriately matched. Therefore, this research looks solely at students who are attending college (both 2 and 4-year and public and private institutions of varying selectivity).

I am excluding students who have not taken either the SAT or ACT entrance exam. This excludes students from the sample who only qualified to attend a 2-year college (i.e. they did not take an entrance exam). Students who failed to take an entrance exam might be potential undermatchers. They could be high achievers who missed a crucial step in the application process- completing an entrance exam. However, the College Board research analyzes the ELS data including and excluding the sub-sample of students qualified to attend 2-year postsecondary

institutions and finds that excluding these students does not alter their results substantially (see discussion of Table 4 on page 12, Smith et al. 2012). Therefore, excluding students with no SAT/ACT score, who would not be eligible to attend a four-year institution, is not likely to change my results considerably.

-- Table 1 about here – (summary statistics)

Dependent Variable: Undermatch

To review, previous research defines match as "a student enrolled in a college with a selectivity level that matched the kind of colleges the student would likely have been accepted to given his or her high school qualifications" (Roderick et al. 2008). In previous research, high school qualifications have been measured through GPA and SAT scores (Bowen et al 2009; Roderick et al. 2008; Alon and Tienda 2005) and Advanced Placement (AP) or International Baccalaureate (IB) coursework (Smith et al. 2012). Since ACT/SATs, GPA and AP/IB courses are objective measures that are commonly used in admissions criteria, they are used here to assign students to selectivity levels. Student selectivity ranking is then compared to the institutional selectivity of the first postsecondary institution attended.[2] Students who have matched have a predicted selectivity level that matches the selectivity level of their postsecondary institution. Those students who have undermatched are attending a postsecondary institution with selectivity below an institution they could obtain admittance to.

The undermatch variable is created through a multi-step process. First, colleges are assigned to a selectivity category. The restricted ELS data includes Barron's profiles of each four-year institution. Barron's profiles categorize schools based on the SAT/ACT scores, GPA,

[2] ELS uses Barron's Profiles of American Colleges to rank college competitiveness (Schmitt 2009). Although this ranking system can be problematic (Hess and Hochleitner 2012), it is still a standard measure of school selectivity recognized and used by many researchers within higher education (Smith et al. 2012; Bowen et al. 2009; Roderick et al. 2008).

and class rank of accepted students, as well as the school's admission rate. I have taken the Barron's categories (demarcated by parentheses and italics below) and collapsed them into my own selectivity categories. I exclude colleges ranked as special by Barron's classification since this is a general category for a variety of subject-specific schools that are difficult to classify. My final postsecondary institution categories, which include a category provided by the ELS data for two-year colleges, are below:

- Very Selective (*Most Competitive, Highly Competitive*)
- Selective (*Very Competitive*)
- Less Selective (*Competitive*)
- Nonselective (*Less Competitive, Noncompetitive*)
- Two-Year College (provided by the ELS data)

Secondly, students are assigned a predicted selectivity level also based on the categories above. To do this I use the application and admission data for each student provided by ELS. Initially, I group students based on the selectivity level of the schools they applied to. For example, all students who applied to very selective institutions are coded 1 for acceptance and 0 for denial. If a student applied to a very selective school and a somewhat selective school and was denied entry to the very selective school but admitted to the less selective school she or he is categorized as being admitted to a less selective institution. If a student applied to three selective schools and was denied entry to two, but was admitted to one she or he is labeled as being admitted to a selective institution. Therefore each student, even though she or he likely applied to multiple colleges and was in some cases admitted to multiple colleges, carries only one of two possible descriptors per selectivity category: admitted or not admitted. If a student did not apply they hold no descriptor for that selectivity category, but instead are considered missing data on that variable.

This student data is then used as the outcome variable in four probit analyses. I use a separate probit model to regress whether a student was admitted to a college in each selectivity category on his or her academic credentials. Based on the regression coefficients from the probit analysis and the individual academic performance measures for each student, I predict the probability of being accepted to a very selective institution for all students (not simply those who applied). The academic performance measures include: honors-weighted GPA, ACT/SAT scores, and student participation in AP/IB coursework. These academic measures are used because they are the main academic predictors of a students' likelihood of being admitted by colleges, used by both institutions of higher education and previous scholars studying undermatch. Considering these measures every student is assigned a predicted probability of admission to each selectivity category.

I am able to ensure the probability of admission with a relatively high degree of accuracy because students with similar academic credentials often apply to colleges with different selectivity levels. Therefore, I have many measures of one type of student (in terms of academic ability) and the many colleges they are admitted to. This ensures that even if students are undermatching a comparable group of matchers is available in the sample to facilitate accurate analysis of admittance likelihood to various selectivity schools.

I use probability thresholds similar to those used by Bowen and colleagues (2009) and Smith and colleagues (2012). Students are grouped into selectivity categories based on 90 percent likelihood of being admitted to that selectivity level. Since separate probit regressions are used for each selectivity level students will have a probability score for every level of postsecondary institutional selectivity. For example, a student may have an 85 percent chance of admittance to a very selective institution, a 90 percent chance of admittance to a selective

institution, and a 95 percent chance of admittance to a less selective institution. In this case she or he would be labeled as selective. The 90 percent threshold provides a conservative estimate of undermatching since there is a possibility that a student with an 85 percent likelihood of admittance to a school could feasibly gain admittance to this postsecondary institution.

Finally, students' predicted selectivity level is compared to the selectivity level of their actual postsecondary institution. Students are then labeled as match if the two selectivity levels are the same, undermatch if their predicted selectivity level is higher than the school they attend, or overmatch if their predicted selectivity level is below the selectivity level of the institution they attend.

Key Independent Variables: Parental Education and Cultural Capital Measures

Parental Education. Four different education categories are used to best capture the importance of various educational thresholds. First, students whose parents have a high school degree or less are referred to as least-educated parents/families. The second group captures a transition stage between high school and college degrees. These families who have at least one parent has with some college, but no degree, are referred to as somewhat-educated parents/families. Thirdly, families with parents who have graduated from college are referred to as educated parents/families. Finally, students whose parents have a graduate degree or more are referred to as highly educated parents/families.

General Cultural Capital. Sociological research on education has demonstrated that focusing on broad highbrow cultural capital, such as going to the museum or concerts, or taking arts classes (DiMaggio 1982), does not adequately capture the impact of cultural capital on educational outcomes (Lareau and Weininger 2003). The concept of cultural capital is better understood as a resource that that can facilitate action, providing access to scarce rewards

(Lareau and Weininger 2003). Therefore, the following more focused measures have been developed by various scholars for general education-related cultural capital: reading habits or literary climate (e.g., De Graaf et al. 2000; Sullivan 2001); educational resources in the home (e.g., Roscigno and Ainsworth-Darnell 1999); extra-curricular activities (e.g., Lareau 2011); frequency of parents' talks with children about cultural, social, and political issues (e.g., Jaeger 2009; Jaeger 2011). These more current measures allow us to be more precise about the content of the cultural dispositions that are rewarded within the education system. Previous research demonstrates that these measures are able to more accurately predict the success of students within the postsecondary educational system. I have used past research as a guide to measure general cultural capital and chosen indicators within the limited survey questions provided by ELS.

Following previous research, my measures of general cultural capital pertain to educational resources in the student's family home, and other indicators of parent-child interactions that demonstrate concerted cultivation. These measures come from either the student or parent base year survey of ELS. A list of questions, along with the survey of origin, is included in Table 2.

The first set of variables measure educational resources available to students at home. Reading climate has been used as an indicator of concerted cultivation (Cheadle 2008; Roksa and Potter 2011). According to DeGraaf, DeGraaf and Kraaykamp (2000) parents who read more frequently not only have more educational skills at their disposal, but they also provide to a cultural home environment that has an affinity with and resembles the school environment. The presence of books, magazines, and newspapers in a family's home is often used as an indicator of the type of home climate. These are seen as material academic resources that encourage

children's learning. Today, a computer and Internet access are also valuable learning tools. Therefore, if the family has access to these items in their home this suggests both a positive reading and learning climate.

Student expectations are also considered an element of general cultural capital. While educational expectations have not always been considered part of the cultural capital tradition since Bourdieu first introduced the concept, more and more studies in the field are starting to include expectations as a manifestation of habitus (Barone 2006; Dumais 2002; McClelland 1990; Roksa and Potter 2011). Since Bourdieu describes habitus as deeply internalized dispositions that generate 'thoughts, perceptions, expressions, and actions,' it has been considered the foundation of cultural capital (Bourdieu 1990:55; Reay 2004; Roksa and Potter 2011).

Parent-child interactions estimate the frequency with which parents interact with their children about school-related topics. Lareau (2003) conceived of a parenting style that is especially apt at imparting cultural capital, she referred to this type of parenting as concerted cultivation. Previous research has conceptualized Lareau's (2003) concerted cultivation as parent-child discussion, including how often parents talk to children about school work, school experiences, or other school related topics (Roksa and Potter 2011). The following measures indicate a parental concern for the educational performance of their child.

Finally, I include variables to capture parental interaction with the student's high school. Parents' interaction with the school is often described as a component of concerted cultivation and has been recognized in previous research as an important source of cultural capital (Cheadle 2008; Dumais and Ward 2009; Lareau 2003; McDonough 1997). Involvement in school occurs most frequently for parents whose culture and lifestyle are congruent with the school's culture

(Lee and Bowen 2006). I will combine indicators of each of these aspects of cultural capital into a single general cultural capital measure using factor analysis and use the resulting factor scores as an independent variable in regression models.

-- Table 2 about here – (general cc measures)

College-Specific Cultural Capital. Although the undermatching literature details the poor outcomes related to lacking information about college in general, as well as particular colleges, during the selection process (Dillon and Smith 2009; Bowen et al. 2009, Roderick et al. 2008), there is less written about the specific knowledge necessary to match. The measures capturing specific cultural capital represent strategic interactions. For example, whether students talk to their parents about college and whether they talk to their parents specifically about entrance exam preparation.

-- Table 3 about here – (specific cc measures)

The measures of both general cultural capital and specific cultural capital are combined into single indexes of each. By using only one measure of general cultural capital and one measure of specific cultural capital I am able to save degrees of freedom and present a more parsimonious model.

Control Variables

Like other studies of cultural capital, I control for parental income (DeGraaf et al. 2000; Jaeger 2011). Parental income is a continuous variable. For example, families who occupy upper class positions often have high levels of cultural capital as well as other socio-economic resources that can contribute to educational success, such as access to private tutoring (e.g., Jæger 2009; Roscigno and Ainsworth-Darnell 1999; Sullivan 2001). Failing to control for economic resources results in a model that does not estimate cultural capital's independent

association with educational success, but rather the impact of cultural capital along with other financial resources that are correlated with cultural capital (Kingston 2001; Jaeger 2011).

In addition, I include a set of controls similar to those used in previous research and which are likely related to both cultural capital and undermatching (Roksa and Potter 2011; Cheadle 2008; Roscigno and Ainsworth-Darnell 1999). I control for race (white, black, Hispanic, Asian, other), gender, family structure (Roscigno and Ainsworth-Darnell 1999; Teachman 2000), number of siblings (Roscigno and Ainsworth-Darnell 1999), language spoken at home, school type (public or private), percent of students with free/reduced lunch, urbanicity (urban, suburban, rural), and region of the United States (Northeast, South, Midwest, and West).

The models below have been mean imputed (two variables have been imputed: percent of free and reduced lunch and siblings, approximately 600 and 800 respectively). In line with previous research (Smith et al. 2012), I include overmatchers in the reference category along with matchers. Students missing general cultural capital and specific cultural capital measures have been excluded from the analyses. Below I report results from logistic regression analysis of various independent variables on undermatch.

RESULTS

Table 4 demonstrates the bivariate relationship between class and general and specific cultural capitals. As anticipated, parents with higher levels of education have higher levels of both general cultural capital and specific cultural capital. As parental education level decreases, the amount of cultural capital a student has decreases. This indicates that cultural capital is related to class position. Table 4 also shows an initial difference between general and specific cultural capitals. Specific cultural capital is more evenly distributed across class than general cultural capital. The difference between upper and lower classes levels of specific cultural capital

is less than one half of a standard deviation, whereas an equivalent comparison of general cultural capital results in one standard deviation difference between classes. The specific cultural capital gap between classes is half of that between classes in general cultural capital. General cultural capital acquisition is more class dependent than specific cultural capital.

-- Table 4 about here – (distribution of CC by Parental Ed)

Table 5 reports results of the main effects models. For ease of interpretation the models display coefficients of log-odds, but I discuss the data in terms of odds ratios. In agreement with previous research, Model 1 demonstrates that there is a negative relationship between parental education level and a student's likelihood to undermatch. A student's odds of undermatching are more than 50 percent lower for students from highly educated families and almost 30 percent lower for students from educated families compared to students from least-educated families.

Since comparison across models becomes problematic in logistic regression due to the impact of unobserved heterogeneity and rescaling effects (Mood 2010), I report average marginal effects in Appendix A. These alternative specifications demonstrate the same relationships I discuss here.

-- Table 5 about here – (Models 1-4 Main Effects)

Models 2, 3, and 4 in Table 5 demonstrate that both measures of cultural capital have a statistically and substantively significant impact on students' chances of undermatching. The more cultural capital a student has, of either general or specific, the less likely she or he is to undermatch. Both types of cultural capital, when included in the model separately, decrease the odds of undermatching by at least 20 percent. They also both remain significant when the other type is added to the model. Thus, specific cultural capital and general cultural capital are not representing the same cultural resources. Models 2-4 demonstrate that although both cultural

capital measures are working through a similar mechanism (and are correlated .4), they also have independent effects. In the full model, Model 4, for one standard deviation increase in general cultural capital the odds of a student undermatching decreases by 15 percent, and in the case of specific cultural capital the odds of undermatching decrease 17 percent for every standard deviation increase in specific cultural capital.

Models 2 and 3 demonstrate that cultural capital has a mediating effect on class. The benefit of parental education on the odds of undermatching decreases for both students from educated and highly educated families. General cultural capital explains 6-7 percent of the impact on odds of undermatching that was previously accounted for by parental education. Also, after general cultural capital is added to the model, the influence of parental education on undermatching only remains significant at the upper echelons of educational attainment, for students with highly educated parents. Model 3 demonstrates that specific cultural capital is less related to class than general cultural capita, as it only mediates the odds of undermatching by approximately 3 percent. These results indicates that these two types of cultural capital clearly have effects on undermatching independent of a student's class position since the mediation of class is moderate.

A closer inspection of the data via class subsets, in Table 6, reveals that the relationship between cultural capital and undermatching varies based on family background. In Model 5, students with the least-educated parents do not benefit from general cultural capital. Models 6 and 7 demonstrate that for students from somewhat-educated and educated families general cultural capital has the strongest relationship to undermatching. For students with educated parents, general cultural capital decreases one's odds of undermatching by almost 25 percent. Model 8 demonstrates that general cultural capital does not considerably impact one's likelihood

to undermatch among students from highly educated families. However, including general cultural capital and specific cultural capital in the models separately (see Appendix A) demonstrates that alone general cultural capital is marginally effective for this class of students, as the coefficient increases in both strength and significance compared to the full model with both types of cultural capital.

-- Table 6 about here – (Models 5-8 Parental Ed interactions)

The impact of specific cultural capital appears to be nonsignificant among all class groups. However, when it is included in Models 5-8 without general cultural capital (see Appendix A) it becomes more significant and in most cases the strength of the coefficient increases. These results indicate that general cultural capital is the more robust of the two cultural capitals, since the full models mask the noteworthy influence of specific cultural capital.

The models in Table 6 indicate that general cultural capital is not effective for students from least-educated families, marginally effective for upper class students, and most effective for students in the middle of the class distribution. The relationship between specific cultural capital undermatching demonstrates more continuity across class, but it appears to be less effective and less significant than general cultural capital. These results might imply that specific cultural capital's mobilizing function might be muted.

Conversely, the moderating effect that general cultural capital has on specific cultural capital demonstrates the key contribution of specific cultural capital. Table 7 displays separate models restricting to students whose general cultural capital levels are categorized as low, medium, or high. Model 9 demonstrates that students who have limited general cultural capital benefit most substantially from specific cultural capital, significantly more so than other students with higher levels of general cultural capital.

-- Table 7 about here – (Models 9-11 levels of General Cultural Capital)

DISCUSSION

The goal of this study was to elucidate the relationship between class, cultural capital, and educational inequality, here represented by undermatching. By developing a theoretical and conceptual distinction between general and specific cultural capital, I have demonstrated how general cultural capital can serve to reproduce the historic disadvantage of the lower classes by failing to decrease the odds of undermatching for this group, while specific cultural capital serves to mobilize different groups by lowering the odds of undermatching equally across various class groups. The main contributions of this study have been to expand cultural capital beyond one-dimensional analyses and determine how heterogeneity in types of cultural capital affect different populations in either a reproductive or mobilizing fashion.

The various descriptive and logistic regression analyses seem to depict a clear relationship between cultural capital and undermatching in the data that confirm cultural capital to be an important predictor of educational inequality as described by Bourdieu. Both general cultural capital and specific cultural capital are unequally distributed among various class groups. Both decrease the odds of undermatching. Therefore, students at the top of the class spectrum would be assumed to benefit the most from general and specific cultural capitals since they have the most of both. However, while these expectations have been partially born out, the theoretical contribution of resource substitution and mobility theory help tease out the classed processes of educational choice more precisely than Bourdieu's reproduction theory alone.

For example, mediation effects and specific cultural capital require extra theorizing to understand how class may influence undermatching. The mediation effects of both general and specific cultural capital on class are moderate. This seems to support DiMaggio's conception of

cultural capital, as more loosely tied to class than Bourdieu posited. Also, specific cultural capital is more equally distributed across class than general cultural capital. This is likely because it can be acquired later in life. Specific cultural capital mediates the effect of class on undermatching less than general cultural capital. It has more equal effects across class position than general cultural capital. Therefore, its influence on undermatching can be more independent of class position than general cultural capital's impact.

Bourdieu posited that cultural capital accumulation would not only be limited among least-educated families, but also, that if these families did possess cultural capital it could not be employed successfully. In other words, if less-educated parents exhibited behaviors indicating possession of cultural capital, like discussing school with their children, this would not influence their child's likelihood to undermatch. Confirming this theory, the data in Table 4 demonstrate that lower classes do have lower levels of both general and specific cultural capital. Also, Table 5 demonstrates that general cultural capital does not influence students from least-educated families' likelihood to undermatch. Therefore, DiMaggio's theory, which would have predicted that cultural capital would be most beneficial to students in this lowest class or at least equally beneficial to all classes, does not hold. These lower class students are not able to activate general cultural capital in the transition to college.

However, seemingly at odds with these findings that tell a story of reproduction, the data from Table 7, restricting analysis to students with various levels of general cultural capital, demonstrates that specific cultural capital can significantly decrease students' odds of undermatching, even if they lack general cultural capital. A simple analysis of general cultural capital would seem to at least partially confirm Bourdieu's claim that members of lower classes are unable to take advantage of cultural capital. However, since other families with low levels of

general cultural capital are able to benefit from specific cultural capital there is the potential for mobility as well. The moderating effect confirms the theoretical proposition from resource substation, that individuals with limited resources will benefit more significantly from one resource (specific cultural capital) than others who have a plethora of resources (general cultural capital) from which to draw.

My findings suggest three important relationships between class, cultural capital and undermatching. First, in broad strokes it appears as though cultural capital contributes to class reproduction. For example, there is a negative relationship between class and one's likelihood to undermatch. Likewise, there is a negative relationship between cultural capital and one's likelihood to undermatch. Cultural capital is also unequally distributed by class, with upper classes having more and lower classes having less. These findings demonstrate the advantage upper class students enjoy as a result of cultural capital.

Secondly, by recognizing the important difference between general and specific cultural capital, I am able to highlight the dually replicating and mobilizing functions of cultural resources within the education system. While it is true that both measures of cultural capital decrease one's odds of undermatching, their relationship to educational inequality is different for various groups. The acquisition and activation of general cultural capital is more class dependent than specific cultural capital. General cultural capital is distributed unevenly by class and is not effectively activated by the lower classes. Cultural capital's ability to mobilize students is demonstrated by specific cultural capital, which is more evenly distributed by class and can be activated successfully by students across the class distribution.

Finally, specific cultural capital's mobilizing function can stretch to the extremes of the distribution. Contrary to what Bourdieu might have surmised, students with low levels of general

cultural capital can possess enough specific cultural capital to benefit their college choice process. Specific cultural capital can improve a student's odd of undermatching despite very low levels of general cultural capital. In fact, the influence of specific cultural capital is the strongest for these students. Specific cultural capital can clarify where there is room for mobility in the education system. This is significant because specific cultural capital is a resource that can be more easily acquired than general cultural capital, which is likely inherited relatively unconsciously over a longer period of time.

There is one especially important implication to be drawn from these findings. That is that the similarly strong relationship of general and specific cultural capital to undermatching, indicates that policy interventions late in a student's life (during high school) can be as important as long-term, ingrained learning that happens in families.

This study's findings indicate that a useful avenue for future research would be to explicitly test whether one avenue of cultural capital's influence on student graduation rates might be through their likelihood to undermatch, thereby influencing their likelihood to attend a school with higher or lower graduation rates. Dumais and Ward (2010) found that measures of cultural capital had a slight impact on enrollment, but found no relationship to college graduation rates. Previous research on undermatching indicates that student graduation rates are significantly impacted by the selectivity of the postsecondary institution they attend (Bowen et al 2009). It seems possible that cultural capital might have indirect effects on student graduation rates not tested in previous research.

Table 1: Summary Statistics

Variable	Mean	Standard Deviation	Min.	Max.
Undermatch	.348	.476	0	1
Cultural Capital				
General Cultural Capital	.189	.925	-3.612	5.134
Specific Cultural Capital	.203	.858	-2.681	1.787
Parental Education				
High School or Less	.197	.398	0	1
Some College or Two-Year	.315	.464	0	1
College Degree	.260	.438	0	1
Graduate Degree or More	.229	.420	0	1
Region				
Northeast	.183	.386	0	1
South	.273	.446	0	1
Midwest	.362	.481	0	1
West	.181	.385	0	1
High School Location				
Urban	.330	.383	0	1
Suburban	.492	.500	0	1
Rural	.178	.383	0	1
High School Percent Free/Reduce Lunch	24.507	24.504	0	100
Private High School	.273	.446	0	1
Parental Income	9.473	2.277	1	13
Family Structure				
Intact Family	.659	.474	0	1
Step Family	.140	.347	0	1
Single-Parent Family	.194	.395	0	1
Other Family	.007	.086	0	1
Number of Siblings	2.149	1.444	0	6
Non-English at Home	.143	.350	0	1
Academic Ability				
GPA	2.943	.788	0	4.59
SAT	992.753	210.427	392.107	1600
Female	.538	.499	0	1
Race				
White	.624	.476	0	1
Black	.116	.484	0	1
Hispanic	.109	.320	0	1
Asian	.102	.303	0	1
Other	.049	.215	0	1

7,540 observations

Table 2: General Cultural Capital

Variable	Question Cronbach's Alpha .7925
	Student Expectations
BY Student[3] (bystexp)	What level of education do you expect to receive? 1. Less than high school graduation; 2. High school graduation or GED only; 3. Attend or complete 2-year college/school; 4. Attend college, 4-year degree incomplete; 5. Graduate from college; 6. Obtain Master's degree or equivalent; 7. Obtain PhD, MD, or other advanced degree.
	Educational Resources
BY Student (BYS84A) (BYS84B) (BYS84H) (BYS84C) (BYS84D)	Does your family have these items in your home? 0. No; 1. Yes • Daily newspaper • Weekly magazines • More than 50 books • Computer • Internet
	Parent-Child Interactions Related to School
BY Student (BYS85A)	How often did your parent or guardian check that you completed all of your homework? 1. Never; 2. Seldom; 3. Usually; 4. Always
BY Student (BYS85B)	Looking back over the past year, how frequently did your parent or guardian participate in the following activities with you? Working on homework or school projects 1. Never; 2. Rarely; 3. Sometimes; 4. Frequently
BY Student (BYS86A) (BYS86C) (BYS86B) (BYS86D) (BYS86H)	In the first semester or term of this school year, how often have you discussed the following with either or both of your parents or guardians? 1. Never; 2. Sometimes; 3. Often • Selecting courses or programs at school • Things you've studied in class • School activities or events of particular interest to you • Your grades • Current events
	Parental Interaction with School
BY Parent (BYP53B) (BYP53C) (BYP53D) (BYP53I)	Since your tenth graders school opened last fall, how many times have you or your spouse/partner contacted the school about the following? 1. Never; 2. Once or twice; 3. Three or four times; 4. More than four times • Your tenth grader's school program for this year • Your tenth grader's plans after leaving high school • Your tenth grader's course selection for entry into college, vocational, or technical school after completing high school • Helping with homework
BY Parent (BYP54A) (BYP54B) (BYP54C) (BYP54D) (BYP54E)	In this school year, do you or your spouse/partner do any of the following? 0. No; 1. Yes • Belong to the school's parent-teacher organization • Attend meetings of the parent-teacher organization • Take part in the activities of the parent-teacher organization • Act as a volunteer at school • Belong to any other organization with several parents from your tenth grader's school (for example, neighborhood or religious organizations)

[3] BY- base year; F1- first follow up; student- from the student survey; parent- from the parent survey.

Table 3: College-Specific Cultural Capital

Variable	Question Cronbach's Alpha .6837
	Parental Advice About College Index Variable
BY & F1 Student (BYS86F) (F1S64G) (BYS86G) (F1S64H)	In the first semester or term of this school year, how often have you discussed the following with either or both of your parents or guardians? 1. Never; 2. Sometimes; 3. Often • Plans and preparation for ACT or SAT tests • Going to college

Table 4: Cultural Capital Distributed by Class

General Cultural Capital

Parental Education Level	Observations	Mean	Standard Dev.	Min	Max
High School or Less	1660	-.520	.969	-4.289	3.846
Some College	2650	-.107	.971	-4.079	5.023
College Degree	2190	.188	.921	-2.774	5.323
Graduate Degree or More	1930	.378	.934	-3.659	5.395

Specific Cultural Capital

Parental Education Level	Observations	Mean	Standard Dev.	Min.	Max
High School or Less	1660	.002	.901	-2.681	1.756
Some College	2650	.149	.871	-2.681	1.787
College Degree	2190	.277	.826	-2.681	1.787
Graduate Degree or More	1930	.366	.795	-2.681	1.787

Table 5: Main Effects Model

Logistic Coefficients- Regression of Undermatch on Select Independent Variables

Variable	Model 1	Model 2	Model 3	Model 4
Black	-.975***	-.976***	-.887***	-.912***
	(.168)	(.169)	(.170)	(.171)
Hispanic	-.417*	-.455*	-.402*	-.432*
	(.180)	(.180)	(.181)	(.181)
Asian	-.801***	-.883***	-.809***	-.863***
	(.188)	(.189)	(.187)	(.189)
Other	-.280	-.274	-.260	-.261
	(.183)	(.187)	(.189)	(.190)
Female	-.111	-.097	-.071	-.072
	(.079)	(.079)	(.080)	(.080)
GPA	.977***	.994***	1.024***	1.023***
	(.082)	(.082)	(.082)	(.082)
SAT/ACT	.002***	.002***	.002***	.002***
	(.000)	(.000)	(.000)	(.000)
Non-English at Home	-.231	-.290	-.236	-.274
	(.189)	(.174)	(.171)	(.172)
Siblings	-.035	-.046	-.046	-.051
	(.031)	(.032)	(.032)	(.032)
Step Family	.024	.005	.032	.017
	(.118)	(.118)	(.117)	(.118)
Single-Parent Family	-.091	-.144	-.100	-.133
	(.105)	(.107)	(.105)	(.106)
Other Family	.082	-.009	.084	.021
	(.471)	(.479)	(.476)	(.480)
Parental Income	-.046*	-.037	-.041	-.036
	(.023)	(.023)	(.023)	(.023)
HS Private	-.221	-.200	-.218	-.204
	(.135)	(.137)	(.137)	(.137)
HS Free/Reduced Lunch	.119***	.116***	.117***	.115***
	(.031)	(.031)	(.032)	(.032)
HS Location- Suburban	.239*	.243*	.244*	.246*
	(.109)	(.109)	(.109)	(.109)
HS Location- Rural	.351*	.351*	.352*	.352*
	(.139)	(.137)	(.138)	(.137)
Region- South	.408**	.419**	.372**	.389**
	(.132)	(.131)	(.133)	(.131)
Region- Midwest	.536***	.568***	.557***	.554***
	(.123)	(.122)	(.122)	(.122)
Region- West	.809***	.845***	.782***	.815***
	(.145)	(.142)	(.144)	(.143)
Parental Ed.- Some College	-.070	-.028	-.051	-.028
	(.105)	(.107)	(.105)	(.107)
Parental Ed.- College Degree	-.318**	-.229	-.284*	-.232
	(.122)	(.124)	(.122)	(.124)
Parental Ed.- Graduate Degree	-.722***	-.613***	-.670***	-.610***
	(.135)	(.137)	(.135)	(.137)
General Cultural Capital	--	-.230***	--	-.156**
		(.046)		(.050)
Specific Cultural Capital	--	--	-.250***	-.184**
			(.050)	(.054)
Constant	-6.470***	-6.627***	-6.590***	-6.663***
	(.441)	(.442)	(.444)	(.443)

N = 7,540. Observations rounded to the nearest ten.
Standard errors in parenthesis. * p < .05, ** p< .01, *** p< .001 (two-tailed tests).
Reference categories: White students, male students, English spoken at home, two-parent in-tact family, public high school, urban schools, and the Northeast.

Table 6: Class Interactions and Cultural Capital

Regression of Undermatch on Selected Independent Variables by Parental Education Level

Variable	Model 5 High School or Less	Model 6 Some College	Model 7 College Degree	Model 8 Graduate Degree
Black	-2.170***	-1.152***	-.956**	.185
	(.595)	(.312)	(.344)	(.288)
Hispanic	-1.262**	-.407	-.412	.532
	(.445)	(.314)	(.349)	(.331)
Asian	-1.801**	-.886*	-.949**	-.629
	(.555)	(.379)	(.346)	(.340)
Other	-.256	-.516	-.433	.142
	(.377)	(.327)	(.408)	(.374)
Female	-.000	-.226	-.087	-.083
	(.241)	(.144)	(.161)	(.163)
GPA	1.131***	1.302***	.755***	.968***
	(.181)	(.142)	(.143)	(.187)
SAT/ACT	.005***	.003***	.003***	.000
	(.000)	(.000)	(.000)	(.001)
Non-English at Home	.597	-.143	-.391	-.391
	(.476)	(.326)	(.367)	(.402)
Siblings	-.017	-.086	-.061	-.010
	(.086)	(.058)	(.059)	(.067)
Step Family	-.027	.073	.116	-.158
	(.271)	(.218)	(.247)	(.330)
Single-Parent Family	-.449	-.241	-.078	-.079
	(.311)	(.195)	(.218)	(.225)
Other Family	1.094	.332	-1.123	.090
	(.857)	(.819)	(1.105)	(1.406)
Parental Income	.029	.004	-.144	-.062
	(.049)	(.044)	(.050)	(.053)
HS Private	-.248	-.369	-.306	.156
	(.358)	(.257)	(.206)	(.214)
HS Free/Reduced Lunch	.141	.098	.117	.194**
	(.073)	(.050)	(.052)	(.057)
HS Location- Suburban	.288	.367	.288	.076
	(.292)	(.195)	(.200)	(.208)
HS Location- Rural	.217	.300	.304	.734**
	(.338)	(.199)	(.238)	(.263)
Region- South	.548	.419	.236	.617**
	(.312)	(.230)	(.222)	(.244)
Region- Midwest	.902**	.726**	.472*	.567**
	(.315)	(.218)	(.212)	(.224)
Region- West	.670	.662**	.936***	1.084***
	(.347)	(.260)	(.254)	(.280)
General Cultural Capital	.023	-.187*	-.267*	-.096
	(.131)	(.090)	(.106)	(.091)
Specific Cultural Capital	-.173	-.189^	-.167^	-.206^
	(.140)	(.101)	(.093)	(.116)
Constant	-10.039***	-8.806***	--5.497***	-4.909***
	(1.173)	(.813)	(.812)	(.930)
	N = 1,240	N= 2,300	N= 2,090	N=1,890

Observations rounded to the nearest tenth.

Standard errors in parenthesis. ^ p<.1 ,* p < .05, ** p< .01, *** p< .001 (two-tailed tests).

Reference categories: White students, male students, English spoken at home, two-parent intact family, public high school, urban schools, and the Northeast.

Table 7: Specific Cultural Capital

Regression of Undermatch on Selected Independent Variables by Levels of General Cultural Capital

Variable	General Cultural Capital:	Model 9 Low	Model 10 Medium	Model 11 High
Black		-1.173***	-1.095**	-.417
		(.311)	(.320)	(.268)
Hispanic		-.198	-.653*	-.389
		(.277)	(.316)	(.350)
Asian		-.780**	-1.169**	-.911*
		(.279)	(.345)	(.428)
Other		-.174	-.396	-.284
		(.255)	(.406)	(.360)
Female		-.134	-.074	.022
		(.130)	(.128)	(.157)
GPA		1.175***	.871***	1.004***
		(.137)	(.121)	(.153)
SAT/ACT		.003***	.002***	.001*
		(.000)	(.001)	(.001)
Non-English at Home		-.434*	.105	-.148
		(.241)	(.321)	(.414)
Siblings		-.036	-.113*	-.023
		(.046)	(.055)	(.059)
Step Family		-.090	-.068	.064
		(.185)	(.213)	(.247)
Single-Parent Family		-.219	-.366	.289
		(.175)	(.204)	(.234)
Other Family		.144	-.803	1.303
		(.686)	(.953)	(.929)
Parental Income		-.011	-.106*	-.019
		(.039)	(.042)	(.045)
HS Private		-.705**	-.090	.107
		(.223)	(.174)	(.217)
HS Free/Reduced Lunch		.051	.192***	.138*
		(.049)	(.050)	(.054)
HS Location- Suburban		.410*	.033	.274
		(.181)	(.149)	(.199)
HS Location- Rural		.301	.221	.556*
		(.217)	(.214)	(.246)
Region- South		.351	.396*	.527*
		(.214)	(.181)	(.253)
Region- Midwest		.664**	.544**	.557*
		(.216)	(.177)	(.230)
Region- West		.816**	1.018***	.526
		(.234)	(.231)	(.279)
Parental Ed.- Some College		-.073	-.324	-.212
		(.164)	(.214)	(.270)
Parental Ed.- College Degree		-.090	-.344	-.500
		(.210)	(.217)	(.275)
Parental Ed.- Graduate Degree		-.640**	-.517*	-.781**
		(.218)	(.247)	(.297)
Specific Cultural Capital		-.288***	-.172	-.010
		(.077)	(.092)	(.104)
Constant		-8.134***	-5.222***	-6.465***
		(.661)	(.710)	(.743)
Observations rounded to the nearest tenth.		N = 2,790	N= 2,300	N= 2,120

Standard errors in parenthesis. * p < .05, ** p< .01, *** p< .001 (two-tailed tests).

Reference categories: White students, male students, English spoken at home, two-parent intact family, public high school, urban schools, and the Northeast.

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APPENDIX A

Marginal Effects of Table 4: Main Effects Model

Variable	Model 1	Model 2	Model 3	Model 4
Black	-.138***	-.138***	-.127***	-.130***
	(.020)	(.020)	(.021)	(.021)
Hispanic	-.066*	-.071**	-.063*	-.068*
	(.027)	(.027)	(.027)	(.027)
Asian	-.118***	-.127***	-.118***	-.125***
	(.024)	(.023)	(.024)	(.023)
Other	-.146	-.044	-.042	-.042
	(.029)	(.029)	(.029)	(.029)
Female	-.018	-.015	-.011	-.011
	(.013)	(.012)	(.013)	(.013)
GPA	.155***	.157***	.162***	.161***
	(.012)	(.012)	(.012)	(.012)
SAT/ACT	.000***	.000***	.000***	.000***
	(.000)	(.000)	(.000)	(.000)
Non-English at Home	-.037	-.046	-.037	-.043
	(.028)	(.028)	(.027)	(.027)
Siblings	-.006	-.007	-.007	-.008
	(.005)	(.005)	(.005)	(.005)
Step Family	.004	.001	.005	.003
	(.019)	(.019)	(.019)	(.005)
Single-Parent Family	-.014	-.022	-.016	-.021
	(.016)	(.016)	(.016)	(.016)
Other Family	.013	-.001	.014	.003
	(.077)	(.076)	(.077)	(.077)
Parental Income	-.007*	-.006	-.007	-.006
	(.004)	(.004)	(.004)	(.004)
HS Private	-.035	-.032	-.034	-.032
	(.022)	(.022)	(.022)	(.022)
HS Free/Reduced Lunch	.019***	.018***	.018***	.018***
	(.005)	(.005)	(.005)	(.005)
HS Location- Suburban	.037*	.037*	.038*	.038*
	(.017)	(.016)	(.016)	(.016)
HS Location- Rural	.056*	.055*	.055*	.055*
	(.022)	(.022)	(.022)	(.021)
Region- South	.060**	.061**	.054**	.056**
	(.019)	(.019)	(.019)	(.019)
Region- Midwest	.080***	.084***	.083***	.085***
	(.018)	(.017)	(.018)	(.018)
Region- West	.127***	.131***	.122***	.126***
	(.023)	(.022)	(.022)	(.022)
Parental Ed.- Some College	-.012	-.005	-.009	-.005
	(.018)	(.018)	(.018)	(.018)
Parental Ed.- College Degree	-.052*	-.037	-.046*	-.038
	(.020)	(.020)	(.020)	(.020)
Parental Ed.- Graduate Degree	-.111***	-.094***	-.102***	-.093***
	(.021)	(.021)	(.021)	(.021)
General Cultural Capital	--	-.036***	--	-.025**
		(.007)		(.008)
Specific Cultural Capital	--	--	-.039***	-.029**
			(.008)	(.008)

N = 7,270. Observations rounded to the nearest ten.
Standard errors in parenthesis. * p < .05, ** p< .01, *** p< .001 (two-tailed tests).
Reference categories: White students, male students, English spoken at home, two-parent in-tact family, public high school, urban schools, and the Northeast.

Marginal Effects of Table 6: Class Interactions and Cultural Capital

Variable	Model 5 High School or Less	Model 6 Some College	Model 7 College Degree	Model 8 Graduate Degree
Black	-.236***	-.147***	-.138**	.032
	(.043)	(.033)	(.042)	(.051)
Hispanic	-.162**	-.059	-.066	.097
	(.050)	(.044)	(.053)	(.064)
Asian	-.210**	-.118**	-.138**	-.091
	(.049)	(.044)	(.042)	(.043)
Other	-.038	-.073	-.069	.024
	(.054)	(.043)	(.060)	(.065)
Female	-.000	-.032	-.014	-.014
	(.032)	(.020)	(.026)	(.027)
GPA	.149***	.185***	.123***	.161***
	(.023)	(.019)	(.023)	(.011)
SAT/ACT	.001***	.000***	.000***	.000
	(.000)	(.000)	(.000)	(.000)
Non-English at Home	.079	-.020	-.063	-.065
	(.062)	(.046)	(.060)	(.067)
Siblings	-.002	-.012	-.010	-.001
	(.011)	(.008)	(.009)	(.011)
Step Family	-.004	.011	.019	-.026
	(.036)	(.032)	(.041)	(.052)
Single-Parent Family	-.057	-.033	-.013	-.013
	(.038)	(.026)	(.035)	(.037)
Other Family	.159	.049	-.146	.015
	(.130)	(.125)	(.107)	(.244)
Parental Income	.004	.001	-.023	-.010
	(.006)	(.006)	(.008)	(.009)
HS Private	-.033	-.052	-.050	.026
	(.047)	(.037)	(.034)	(.035)
HS Free/Reduced Lunch	.019	.014*	.019*	.032***
	(.009)	(.007)	(.008)	(.009)
HS Location- Suburban	.037	.051*	.046	.012
	(.037)	(.026)	(.031)	(.033)
HS Location- Rural	.028	.041	.048	.132**
	(.043)	(.032)	(.038)	(.047)
Region- South	.067	.055	.035	.092**
	(.037)	(.030)	(.032)	(.035)
Region- Midwest	.119**	.100***	.073*	.083**
	(.038)	(.029)	(.032)	(.031)
Region- West	.084	.090**	.155***	.178***
	(.043)	(.035)	(.042)	(.046)
General Cultural Capital	.003	-.026*	-.043*	-.016
	(.017)	(.013)	(.017)	(.015)
Specific Cultural Capital	-.023	-.027	-.027	-.034
	(.018)	(.014)	(.015)	(.019)
	N = 1,200	N= 2,200	N= 2,020	N=1,840

Observations rounded to the nearest tenth.
Standard errors in parenthesis. * p < .05, ** p< .01, *** p< .001 (two-tailed tests).
Reference categories: White students, male students, English spoken at home, two-parent intact family, public high school, urban schools, and the Northeast.

Class Interactions and Cultural Capital: Separate Analyses of General and Specific Cultural Capital

Variable	High School or Less		Some College		College Degree		Graduate Degree	
General Cultural Capital	-.033	--	-.235**	--	-.308**	--	-.168*	--
	(.105)	--	(.078)	--	(.098)	--	(.082)	--
Specific Cultural Capital	--	-.162	--	-.271**	--	.370**	--	-.264*
	--	(.122)	--	(.093)	--	(.089)	--	(.109)
Controls*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	N = 1,200		N= 2,200		N= 2,020		N=1,840	

Observations rounded to the nearest tenth.
Standard errors in parenthesis. * p < .05, ** p< .01, *** p< .001 (two-tailed tests).
* Same controls included in Table 6.
Reference categories: White students, male students, English spoken at home, two-parent intact family, public high school, urban schools, and the Northeast.