Latino School Concentration and Academic Performance among Latino Children*

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Objective. To examine the effects of the concentration of Latino students in elementary schools on Latino first graders' test scores, and to determine if the effects vary by children's nativity status. *Methods.* We use generalized estimating equations (GEE) on a sample of Latino first graders from the Early Childhood Longitudinal Study-Kindergarten Class of 1998 (ECLS-K). *Results.* For math and reading, Latino concentration in schools improves students' first grade test scores for Latino children of immigrants, but it has no effect for Latino children of U.S.-born parents. For general knowledge test scores, Latino concentration has no effect for children of immigrants and has a deleterious impact on the scores of children of U.S.-born parents. We also show no effect of Latino concentration on the scores of white children of U.S.-born parents. *Conclusions.* The results suggest that Latino concentration in elementary schools promotes educational outcomes for children from Latino immigrant families, but Latino families headed by U.S.-born parents do not benefit from coethnic concentration, which is in accordance with expectations derived from assimilation theories.

In the United States, the share of the population with Latino ancestry has grown from 9 percent in 1990 to 15 percent in 2006–08 (U.S. Census Bureau, 1991, 2011). This growth has coincided with increases in residential and school Latino-white racial segregation (Fry, 2007; Iceland, Weinberg, and Steinmetz, 2002). Given the growing presence of this increasingly segregated group in the United States, it is important to examine how Latino concentration in schools affects Latino children's educational outcomes. Research on African-American youth, going back to the Coleman Report (1966),

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has shown that their educational outcomes are negatively related to the proportion of black students in a school (Bankston and Caldas, 1996; Caldas and Bankston, 1998, 1999; Cutler and Glaeser, 1997; Wells and Crain, 1994). Moreover, there is evidence that the presence of "minorities" (African-American and Latino students) in a school has negative consequences for Latino students' outcomes (Crosnoe, 2005, 2006). While one could extrapolate from these rich lines of research that Latino concentration in schools has deleterious consequences for Latino students' academic achievements, little is actually known about the impact of Latino concentration on Latino children in particular, and whether the relationship varies by immigrant generation.

The purpose of this article is to assess the relationship between school coethnicity (as measured by the proportions of students and teachers who are Latino) and academic achievement in early elementary school among Latino children. Specifically, we address the following questions:

1. How are test scores of Latino children associated with the proportion of Latino students and the proportion of Latino teachers in the school, net of other individual and school characteristics?
2. Is the relationship between the proportions of Latino students and teachers and test scores for children of U.S.-born parents (third and higher generation children) different from the relationship for children of immigrant parents (first and second generation children)?

Background

Currently the Latino population is the fastest growing racial/ethnic population in the United States. Because of migrant networks that lead newcomers to existing Latino communities (Chapa and Valencia, 1993; Massey et al., 1987), Latino segregation has increased at a faster rate than for other groups (Frankenberg, Lee, and Orfield, 2003). Presently, the racial isolation of Latino students is comparable to that of African-American students. In the 2005–06 school year, 56 percent of Latinos attended majority-Latino schools, compared to the 50 percent of African-American students who attended majority-black schools, and 17 percent of Latino students attended schools which are 90–100 percent Latino, compared to the 22 percent of African-American students who attended schools that are 90–100 percent black (Fry, 2007).

The segregation of Latino youth naturally has led practitioners, policymakers, and scholars to question its impact on Latino youths' well-being, especially their educational performance. Some have looked to research on school segregation of African Americans for insight; this research has suggested that there are negative effects of minority concentration on academic performance, independent of individual and school characteristics, and these effects are stronger for African-American students than for white students (Bankston and Caldas,

1996; Caldas and Bankston, 1998; Coleman et al., 1966; Hanushek, Kain, and Rivkin, 2009). Studies have also shown positive effects of desegregation on African Americans' test scores and high school completion (Entwisle and Alexander, 1992; Guryan, 2004).

As Goldsmith (2003) pointed out, however, findings from research on African-American school concentration have led researchers to generally assume without empirical verification that concentrations of Latinos have similar effects on Latino students. This actually is not the case, as demonstrated by Goldsmith's (2003, 2004) findings that Latino school concentration has a positive influence on educational aspirations and test scores among Latino high school students. Similarly, Frost (2007) found that the proportion of Latino students in a school is positively related to educational expectations, once controlling for individual and school socioeconomic status. In addition, Portes and Hao (2004) concluded that larger coethnic populations in a school actually attenuate the academic disadvantage faced by Mexican high school students. Other research on nonacademic outcomes also documented protective effects of Latino school concentration against teenage child-bearing (Denner et al., 2001) and alcohol use (Eitle et al., 2009).

Several explanations have been used to explain the positive relationship between Latino concentration and academic outcomes among Latino youth, particularly those who are children of immigrants. One group of explanations suggests that the positive influence of Latino school concentration is due to more positive attitudes about school. First, attending a school with children of the same race increases a sense of belongingness, which benefits social and emotional development (Benner and Crosnoe, 2011). Second, Latinos have higher educational expectations and have more pro-school attitudes in segregated schools (Frost, 2007; Goldsmith, 2004), which may raise Latino achievement. These more positive attitudes toward education in schools of greater Latino concentration may be a result of immigrant families, who tend to favorably compare their situation in the United States to the one in their home country and thus have greater educational expectations (Kao and Thompson, 2003; Kao and Tienda, 1995; Raleigh and Kao, 2010; Valenzuela, 1999; St-Hilaire, 2003). This concentration of immigrant optimism may have positive spillover effects.

Other explanations focus on the social capital that exists within ethnic communities. Current research on immigrant adaptation has suggested that a large Latino presence (both among students and teachers) can be beneficial if it also creates a strong coethnic community high in social capital. The segmented assimilation perspective (Portes and Rumbaut, 2001; Portes and Zhou, 1993) highlights the potential for the benefits of coethnic concentration for immigrant families, suggesting that coethnic community members can provide support for and reinforcement of parental educational expectations for their children (Riegle-Crumb and Callahan, 2009). They can also help supervise children and provide resources that are conducive to academic success (Denner et al., 2001). For instance, community members can help immigrant

parents better navigate the formal education system (Zhou, 2009), which can be beneficial to their children's schooling (Lareau, 2003; Lareau and Horvat, 1999). Maintaining ties to the ethnic community may also reduce conflict between parents and children by ensuring that children's acculturation to the mainstream society does not rapidly outpace that of their parents, and less intergenerational conflict is associated with higher academic achievement and educational aspirations (Portes and MacLeod, 1996; Schmid, 2001; Stanton-Salazar and Dornbusch, 1995; Zhou and Bankston, 1998). Researchers in the segmented assimilation framework also warn that growing up in areas with large concentration of impoverished U.S.-born racial minorities (particularly African Americans) can be deleterious for children of immigrants, who might be downwardly assimilated into an alleged "oppositional culture" (for examples of research casting doubt on the existence of widespread oppositional cultures among African-American students, see Ainsworth-Darnell and Downey, 1998; Harris, 2006, 2008; Tyson, 2011).

Social capital arguments also anticipate that Latino children and their families may benefit from coethnic networks with school staff and teachers. Coethnic staffers and teachers may serve as sources of encouragement, social support, and mentorship for students (Gibson and Hidalgo, 2009; Stanton-Salazar, 2001; Suárez-Orozco, Suárez-Orozco, and Todorova, 2008; Valenzuela, 1999). Latino educators may also be important allies for Latino parents who wish to be involved in their children's schooling (Martinez-Cosio, 2010; Martinez-Cosio and Iannacone, 2007), and they can potentially influence school practices and policies so that they are better able to serve the Latino population (Goldsmith, 2004). In addition, there is also suggestive evidence that minority children are evaluated more favorably by teachers of the same race (Dee, 2005; Downey and Pribesh, 2004), that students have higher levels of achievement when taught by a teacher of the same race (Dee, 2004), and that white teachers' negative evaluations of minority children have especially deleterious consequences for minority students (Oates, 2003). For these reasons, a greater proportion of Latino teachers would be beneficial to a Latino child's academic achievement.

Although the studies on Latino school concentration have helped to increase our understanding of the complexities of racial/ethnic concentration, this work is limited because most studies ignore whether the effect of Latino concentration is contingent on nativity. Researchers have often assumed that the effects are similar irrespective of immigrant generation, which may not be the case (Eitle et al., 2009; Frost, 2007). Other studies solely focused on the children of immigrants and thus cannot speak to the effects of coethnic concentration for the third generation (Kroneberg, 2008; Xie and Greenman, 2011). Goldsmith (2003) is the exception, and he found a higher proportion of Latino students is beneficial for achievement regardless of the student's level of acculturation (measured by whether the student is in an ESL program or has an immigrant parent). His study, however, was of Latino high school students, not elementary school children. As we discuss below, conclusions

from research on high school students may not be generalizable to elementary school children.

There is good reason to believe that Latino children in families headed by U.S.-born parents will benefit less from coethnic concentration than Latino immigrant families. From the classic, or straight-line, assimilation perspective (Gans, 1992), ethnicity becomes less salient with successive generations, and thus the coethnic community may lose its importance over time. This would suggest that any benefits of a large Latino presence in school would be smaller for third and higher generation Latinos than for children of immigrants. In addition, the differences between third and higher generation Latinos and U.S.-born whites should be minimal. The segmented assimilation perspective, however, calls into question the traditional assimilationist notion that over successive generations, ethnic identities become less salient and minority groups become more similar to U.S.-born non-Hispanic whites, both in terms of cultural and structural outcomes. It is argued that Latinos will not reach parity with non-Hispanic whites because of their status as racial/ethnic minorities (Portes and Zhou, 1993). Thus, from this perspective, not only will there be a difference between children of immigrants and children whose parents were born in the United States, there should also be differences between third and higher generation Latinos and U.S.-born non-Hispanic whites.

Another reason that the influence of Latino concentration in school should vary by parents' nativity is provided by ethnographic research on high schools with a large Latino presence. This research has suggested that the contagion effects of immigrant optimism are limited to Latino immigrant families, and are curtailed for families headed by Latino U.S.-born parents (Matute-Bianchi, 1986; Valenzuela, 1999). Valenzuela argued that the optimism of first-generation Mexican immigrant adolescents lead them to form support networks oriented around academic achievement, but usually exclude U.S.-born Mexican American students.

Prior research has not specifically examined whether the influence of school coethnicity varies by nativity status, but some studies show that the effects of other school characteristics do vary by nativity status. For example, Ryabov and Van Hook (2007) found that attending a high school with a low average SES or a high presence of blacks and Latinos has detrimental effects of the grades of Latino immigrant adolescents, but not for Latino children of higher generations. Georgiades et al. (2007), in their examination of elementary-school children in Canada, found more advantages to a large presence of foreign-born individuals for the academic and socioemotional outcomes of children of immigrants than for children of U.S.-born parents. Similarly, Callahan et al.'s (2008) analysis suggests that high schools' ESL programs are most effective for second-generation Mexican-origin adolescents in high schools with a large immigrant concentration. On the other hand, Pong and Hao (2007) found that the high school grades of adolescent children of immigrants are harmed by a large presence of foreign-born individuals slightly more than those of children of U.S.-born parents.

Conclusions from prior research on Latino concentration are also limited because they focus primarily on the high school period; none specifically examine whether the benefits of school coethnicity also exist in elementary school. As far as we can tell, no study has examined the effects of Latino school concentration on school performance during the early elementary school years.[1] This is a crucial period because early school experiences lay the groundwork for a child's educational career, and early disadvantages in school accumulate, thus having long-term consequences for dropout and attainment (Alexander et al., 1988; Crosnoe, 2005). As argued by Alexander et al. (1988), the beginning school transition marks the transition from the "home child" to the "school child," and examining achievement this early on can offer important insights into the social forces outside the home that influence achievement. We also suggest that the examination of early school context is even more important, especially among Latinos. The transition into elementary school can be especially traumatic for minority children, who tend to experience sharp cultural discontinuities between home and school, producing a "mismatch between student and social context" (Entwisle and Alexander, 1993: 405). Not only is this time a critical transition period in general for all children, but it may especially be so for young children of immigrants because their parents will also be new to the American educational system. Thus, the presence of a large coethnic community may help ease the transition for immigrant families and their children more than for those whose parents were born and schooled in the United States. The discontinuities that immigrant children and families face may dissipate the longer those families stay in the United States, resulting in a lack of nativity differences in the benefits of Latino concentration schools attended by adolescents, which is consistent with the findings of Goldsmith (2003).

In this article, we assess the influence of the proportion of Latino students and Latino teachers on Latino children's academic achievement in the first grade, taking into account individual and other school characteristics. In addition, we examine whether or not its influence differs for children whose parents are immigrants and those whose parents were born in the United States.

Data and Methods

Data

We use data from the restricted access version of the Early Childhood Longitudinal Study Kindergarten Class of 1998–99 (ECLS-K). The ECLS-K

[1] Crosnoe's (2005, 2006) studies showing negative effects of the presence of minorities (but not specifically Latinos) in a school on Mexican-immigrant children's math scores is a partial exception.

best suits the purposes of this study because it is one of the few nationally representative datasets on early childhood schooling experiences, and it is the only one large enough to allow an analysis of Latino children of immigrants. The ECLS-K consists of a nationwide multistage random sample of U.S. kindergarteners in the 1998–99 school year. Starting in the fall of the children's kindergarten year, researchers assessed them on a variety of cognitive and behavioral dimensions and interviewed their parents, teachers, and school administrators. Researchers followed up with the children in first, third, fifth, and eighth grades. Because we are interested in the beginning school transition, in this study we utilize data from kindergarten and the first grade.

We limit our analyses to children who lived with at least one biological parent and whose parent agreed to be interviewed in the spring of the first grade, leaving us with samples of 1,330 Latino children of immigrants in 420 schools, 1,030 Latino children of U.S.-born parents in 540 schools. For comparative analyses, we also have 1,610 African-American children of U.S.-born parents in 530 schools, and 8,240 white children of U.S.-born parents in 1,270 schools.[2,3] Multiple imputation routines in Royston, Carlin, and White's (2009) "ice" package for Stata were used to create and analyze five imputed datasets to address missing values in predictors. We dropped cases with missing values on our dependent variables.[4] Summary statistics of all of our variables are presented in Table 1.

Measures

Dependent Variables.

Test scores. In the spring of the first grade year, students were assessed on math, reading, and "general knowledge" (a hybrid science/social studies test). The item response theory (IRT) scores from these assessments serve as the outcomes for this study. The assessments from the fall of kindergarten are

[2]All reported sample sizes have been rounded to 10s in compliance with NCES requirements for restricted-access data.

[3]One potential issue with studies of Latino families is the possibility of obtaining a sample unrepresentative of Latinos because undocumented parents are possibly more likely to refuse to be interviewed or refuse to have their children be assessed. In the very first wave of data collection, Latino children had a completion rate of 89.6 percent, compared to completion rates of 90.2 percent and 90.8 percent for white and black children, respectively. The parents of Latino children were less likely to have a completed interviewed (82.7 percent) than the parents of white and black children (87.8 percent and 84.3 percent, respectively), but the difference is small. In the first grade, parents of Latino children were more likely to have a completed interview than parents of black children.

[4]Latino children of immigrants had substantially more missing values on the reading and general knowledge assessments than the math assessment because a Spanish version of the math assessment was made available for children with low English proficiency; no Spanish versions of the reading and general knowledge scores were made and students of low-English proficiency did not participate in those assessments. We discuss the consequences of these exclusions in our results.

TABLE 1

Summary Statistics for First Grade Latino Respondents by Parents' Nativity

Variable	Latino Immigrant Parents ($N = 1,300$) *M*	Latino Native-Born Parents ($N = 1,010$) *M*	White Native-Born Parents ($N = 8,140$) *M*	Black Native-Born Parents ($N = 1,560$) *M*	Combined ($N = 12,000$) *SD*
Dependent Variables					
General knowledge score (1S) (*z*)	−0.88[a]	−0.18[b]	0.35[c]	−0.57[d,e]	0.98
Math score (1S) (*z*)	−0.47[a]	−0.17[b]	0.24[c]	−0.50[e]	1.01
Reading score (1S) (*z*)	−0.47[a]	−0.15[b]	0.15[c]	−0.36[e]	1.00
Independent Variables, Individual Level					
Nationality					
South American	0.06[a]	0.01	—	—	—
Central American	0.13[a]	0.01	—	—	—
Cuban	0.03	0.02	—	—	—
Puerto Rican	0.06[a]	0.10	—	—	—
Mexican	0.70[a]	0.53	—	—	—
Not specified	0.02[a]	0.33	—	—	—
Female	0.48	0.47	0.49	0.50	—
Parents' Education					
High school or less	0.68[a]	0.46[b]	0.27[c]	0.50[d]	—
Some college	0.22[a]	0.39	0.34[c]	0. 37[d]	—
Bachelors' degree or more	0.10[a]	0.15[b]	0.39[c]	0.12	—
Parents' income (logged)	9.94[a]	10.36[b]	10.82[c]	9.86[e]	0.92
Parents' Educational Expectations					
No BA	0.18	0.32	0.27	0.26	—
BA	0.36	0.37[b]	0.53[c]	0.42	—
Post-BA	0.46[a]	0.31[b]	0.20[c]	0. 32[d]	—

TABLE 1—continued

Variable	Latino Immigrant Parents ($N = 1,300$) *M*	Latino Native-Born Parents ($N = 1,010$) *M*	White Native-Born Parents ($N = 8,140$) *M*	Black Native-Born Parents ($N = 1,560$) *M*	Combined ($N = 12,000$) *SD*
Single parent	0.19[a]	0.28[b]	0.15[c]	0.57[d,e]	—
Number of siblings	0.93[a]	0.85[b]	0.80[c]	0. 88[d]	0.45
Parent not employed	0.43[a]	0.24	0.27[c]	0.17[d,e]	—
English Proficiency					
Native English speaker	0. 06[a]	0.47	—	—	—
Speaks English well	0. 36[a]	0.52	—	—	—
Does not speak English well	0. 58[a]	0.01	—	—	—
Spanish math assessment	0. 20[a]	0.01	—	—	—
Reading test scores (KF) (*z*)	−0. 59[a]	−0.29[b]	0.11[c]	−0.30[d]	0.95
Math test scores (KF) (*z*)	−0. 70[a]	−0.31[b]	0.22[c]	−0.40[d]	0.98
General knowledge test scores (KF) (*z*)	−0. 82[a]	−0.27[b]	0.30[c]	−0.68[e]	1.00
Independent Variables, School Level					
Proportion Latino	0. 59[a]	0.36[b]	0.07[c]	0.08[d,e]	0.26
Proportion Latino Teachers	0. 25[a]	0.15[b]	0.02[c]	0.03[d,e]	0.14
Proportion immigrant Latino in school zip code	0. 23[a]	0.11[b]	0.02[c]	0.04[d,e]	0.11
Proportion non-immigrant Latino in school zip code	0. 46[a]	0.26[b]	0.06[c]	0.08[d,e]	0.21
Proportion black	0.12	0.12[b]	0.09[c]	0.57[d,e]	0.26
School's Urbanicity					
Suburban	0. 33[a]	0.40[b]	0.48[c]	0.37	—
Rural	0. 06[a]	0.15[b]	0.27[c]	0.16[d]	—
Urban	0. 61[a]	0.45[b]	0.25[c]	0.47[d]	—

TABLE 1—continued

Variable	Latino Immigrant Parents ($N = 1,300$) *M*	Latino Native-Born Parents ($N = 1,010$) *M*	White Native-Born Parents ($N = 8,140$) *M*	Black Native-Born Parents ($N = 1,560$) *M*	Combined ($N = 12,000$) *SD*
School Socio economic status (*z*)	−0. 85[a]	−0.35[b]	0.27[c]	−0.67[d,e]	0.99
Other students' reading test scores (KF) (*z*)	−0. 50[a]	−0.26[b]	0.09[c]	−0.46[e]	0.99
Other students' math test scores (KF) (*z*)	−0. 89[a]	−0.31[b]	0.24[c]	−0.58[d,e]	1.01
Other students' general knowledge test scores (KF) (*z*)	−0. 80[a]	−0.40[b]	0.28[c]	−0.88[e]	1.00
School enrollment (100s)	7. 36[a]	5.67[b]	4.96[c]	5.38[d]	2.77
School Type					
Public	0. 95[a]	0.90[b]	0.84[c]	0.93	—
Private, Catholic	0.03	0.05[b]	0.08[c]	0.03	—
Private, other	0.02[a]	0.05[b]	0.08[c]	0.04	—
Region					
Northeast	0.13	0.11[b]	0.21[c]	0.10	—
South	0.29	0.30	0.35	0.66[d,e]	—
Midwest	0.07[a]	0.16[b]	0.30[c]	0.17[d]	—
West	0.51[a]	0.43[b]	0.15[c]	0.07[d,e]	—

[a]Significant difference in means/proportions between Latino children of immigrants and Latino children of U.S.-born parents at $p < 0.050$ level.
[b]Significant difference in means/proportions between Latino children of U.S.-born parents and white children of U.S.-born parents at $p < 0.050$ level.
[c]Significant difference in means/proportions between Latino children of immigrants and white children of U.S.-born parents at $p < 0.050$ level.
[d]Significant difference in means/proportions between Latino children of immigrants and Black children of U.S.-born parents at $p < 0.050$ level.
[e]Significant difference in means/proportions between Latino children of U.S.-born parents and Black children of U.S.-born parents at $p < 0.050$ level.

controlled for; thus, the effects of predictors can be interpreted as effects on the change in students' ability from the fall of kindergarten to the spring of first grade. Both waves of these variables are *z*-standardized across all cases in the data, so a value of zero represents the grand mean for all children of all races.

Predictors.

Parents' nativity status. We classify parents as being either foreign-born or U.S.-born. Parents' nativity is based on the biological mother's nativity status if the child lives with her biological mother, a definition used in previous studies (Kao and Tienda, 1995; Turney and Kao, 2009). If the child does not live with her biological mother but her biological father, nativity status is based on the biological father.

Proportion Latino students. Our key independent variable is the proportion of students who are Latino. We use information from the 1998–99 wave of the common core of data (CCD) and Private School Universe Survey (PSS), which are censuses of public and private schools, respectively, conducted by the U.S. Department of Education. When this information was missing, we relied on school administrator reports of the racial composition of their school's student body.[5]

Proportion Latino teachers. We use school administrator reports of the proportion of teachers who are of Latino ethnicity.

Control Variables.

Individual level. We control for a number of child and parent characteristics. For the child, we control for gender, national origin (Mexican, Puerto Rican, Cuban, Central American, South American, and not specified), and fall kindergarten test scores.[6] Following Crosnoe (2006), for our analyses of math we include a dummy variable indicating if the child took the Spanish-language assessment. For parents, we control for the education level of the parent with the most education (high school/GED or less, some college/vocational degree, Bachelors' degree or higher), logged income, indicators for the parent reporting in the first wave that they expected their child to earn a baccalaureate degree or a postbaccalaureate degree, whether or not the child lives with a single parent, number of siblings (logged), the biological parent's employment

[5]ECLS reports of school's Latino representation are highly correlated with CCD reports ($r = 0.97$) and PSS reports ($r = 0.88$).

[6]Missing values on national origin were not imputed during the multiple imputation process, and lacking a specific national origin was treated as a valid response. A substantial proportion (34 percent) of the U.S.-born Latino parent sample did not specify a national origin, suggesting that for these parents nationality is quite unimportant for their identities. It would be potentially misleading to treat these responses as "missing" and to be replaced with "valid" nationality categories.

status (if the child is living with both biological parents, then we use the mother's information) and the English proficiency of the respondent parent (usually the mother).

School level. The proportion of Latino students and teachers in a school may be associated with other school socioeconomic and demographic characteristics that affect academic achievement. Schools serving Latino communities are more likely to be schools populated by students from poor families (Crosnoe, 2005; Pong and Hao, 2007), students of low academic ability (Frost, 2007; Goldsmith, 2004), public schools (Saporito and Sohoni, 2006), urban schools (Pong and Hao, 2007), and larger schools (Crosnoe, 2005; Pong and Hao, 2007). Prior research suggests these features can negatively affect academic achievement (Carbonaro and Covay, 2010; Roscigno et al., 2006) and need to be accounted for when assessing the effect of Latino concentration.

Thus, at the school level we control for school SES (a scale of the average composite SES of all students in the school sample and the school administrator's report of the percent of students eligible for free and reduced-price lunches, alpha = 0.82), and the average fall kindergarten test scores of all the other students at the school, including non-Latino students. We chose to use the average of the scores of other students in the school to isolate peer effects. Although this is not strictly a school-level variable (it varies slightly within schools, and in our multilevel models it is a student-level predictor), we conceptually treat it as such since it captures the effects of school context. We also control for community type (urban/suburb/rural), school enrollment, school sector, region, and the proportion of students who are black.

Methods

Because our cases are clustered in schools, we use hierarchical linear models (HLM), using HLM for Windows version 6, which has special routines for analyzing multiply imputed datasets. Cases were weighted with the cross-sectional parent–child weight C4PW0 (included in the ECLS data). When studying the effects of context on educational outcomes, there is always the possibility of selection bias—that the effect of context represents some unobserved individual-level trait. In this case, it is possible that any association between the Latino presence in a school and children's outcomes is because of some unmeasured characteristics of children or their families. For example, perhaps Latino parents who send their children to schools with a large Latino concentration promote their children's academic achievement in other ways. To deal with this possibility of selection bias, we follow Greenman et al. (2011) and control for children's test scores in the first wave of data collection (fall of kindergarten) and parents' educational expectations. Ideally, the lagged test

scores and parents' educational expectations for their children will capture the effects of family practices promoting academic achievement. In addition, we use impact thresholds for a confounding variable (ITCV) as a sensitivity analysis to determine how robust our results will be to hypothetical confounding variables (Frank, 2000). While our choice of control variables and use of ITCV does not guarantee that any effects of school or neighborhood context are free of spuriousness, they increase our confidence in the possibility that the effects are causal.

For our multivariate analyses we present the effects of schools' share of Latino students on children's test scores controlling for all of our individual- and school-level controls. We analyze Latino children of U.S.-born parents and Latino children of immigrant parents in order to assess differences in the effects of school coethnicity between these two groups. To determine whether effects significantly differ across groups, we use the Clogg test for equality of coefficients (Brame et al., 1998). We also estimate the effects of the proportions of Latino students and teachers among African-American children of U.S.-born parents and white children of U.S.-born parents to provide comparisons. This allows us to assess our hypothesis, extrapolated from the insights of segmented assimilation theory, that Latino concentration will matter more for Latino children of U.S.-born parents than for white children of U.S.-born parents. This comparative analysis will also speak to the issue of whether any observed effects of proportion Latino is due to the role of coethnicity in schooling, or if it is due to some other mechanism resulting from a large Latino student population that has an impact on all groups, not just Latinos.

Results

Before presenting the multivariate analyses, it is worth looking at ethnic and nativity differences in our outcomes. According to the summary statistics depicted in Table 1, there are clear ethnic/nativity inequalities for all three test scores: non-Hispanic white children of U.S.-born parents score the highest (between 0.15 and 0.35 standard deviations above the grand mean for all ECLS respondents), African-American children of U.S.-born parents and Latino children of immigrant parents score the lowest (between 0.36 and 0.88 standard deviations below the grand mean), and Latino children of U.S.-born parents score below white children but above African-American children and Latino children of immigrant parents (around 0.2 standard deviations below the grand mean). These results are in line with prior research showing that immigrant families, particularly those with low levels of human capital, like many Latino immigrant families, face substantial barriers in accommodating and negotiating with educational institutions (Suárez-Orozco and Suárez-Orozco, 2001; Turney and Kao, 2009; White and Glick, 2009).

Effects of Latino School Concentration for Latino Children

Tables 2–4 present results from our multivariate analyses for all math, reading, and general knowledge scores, respectively. Separate estimates for Latino children of immigrants, Latino children of U.S.-born parents, African-American children, and white children are presented in each table. For each group, we estimate three models. Model 1 estimates of the effect of proportion Latino, net of our control variables; Model 2 estimates the effect of proportion Latino teachers, net of our control variables; and Model 3 estimates the effect of both proportion Latino students and proportion Latino teachers simultaneously. All predictors in the models are centered on the mean for Latinos, so the intercepts are interpreted as the predicted test score (expressed as a *z*-score) for a child whose characteristics are average for Latino children in general. The results of the Clogg tests for equality of coefficients are indicated by superscripted letters. For all three outcomes, the intercepts for Latino children of immigrants and Latino children of U.S.-born parents are not significantly different from each other. Even though the summary statistics indicated that Latino children of U.S.-born parents were significantly advantaged on all three outcomes, our results indicate that these differences among Latino children in tested ability are explained by our individual- and school-level controls. However, some significant differences between Latino and non-Latino children persist in our regression models: for math, Latino children of immigrants have significantly higher scores than African-American children; for reading, white children have significantly higher scores than Latino children of immigrants; and for general knowledge white children score higher than Latino children (regardless of nativity), and African-American children score higher than Latino children of immigrants.

Our use of HLM allows us to estimate the variances of the residuals at both the individual and school levels. Chi-square tests indicate that the between-school residual variation is significant for all groups and all outcomes. For all of our models, we calculate the intraclass correlation (ICC) which represents the proportion of residual variation that lies between schools. In general, for most groups the ICC hovers between 0.05 and 0.15, but the ICC for Latino children of U.S.-born parents tends to be substantially higher, and lies between 0.17 and 0.30. This indicates that contextual factors, or unmeasured child-level factors that are clustered in school contexts, are responsible for a greater share of variation in the test scores of Latino children of U.S.-born parents than for the other children.

We first focus our discussion on the effects of the proportions of Latino students and Latino teachers on the test scores of Latino children. For all three outcomes our results suggest that the effects of proportion Latino in schools are significantly different for Latino children of U.S.-born parents and immigrant parents. Furthermore, the effects are more positive for Latino children of immigrant parents than for Latino children of U.S.-born parents, which is in line with our expectations derived from assimilation theories.

TABLE 2

HLM Analysis of Effects of Latino Concentration and Latino Teachers on First Grade Math IRT

	Latino Children of Immigrants ($N = 1{,}300$ in 410 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}010$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 1				
Proportion Latinos in school	0.289*,a	−0.227	0.023	0.108
	(0.143)	(0.188)	(0.129)	(0.293)
Proportion black in school	0.110	−0.406	−0.100	−0.041
	(0.221)	(0.249)	(0.148)	(0.101)
Intercept	−0.276***	−0.378**	−0.178***	−0.624***,d
	(0.053)	(0.115)	(0.048)	(0.102)
Variance Components				
School	0.053***	0.123***	0.057***	0.047***
Individual	0.550	0.472	0.491	0.542
Intraclass correlation	0.088	0.207	0.104	0.081
Model 2				
Proportion Latino teachers	0.371*	−0.054	0.156	−0.417
	(0.148)	(0.232)	(0.220)	(0.746)
Proportion black in school	0.110	−0.305	−0.098	−0.073
	(0.221)	(0.228)	(0.147)	(0.104)
Intercept	−0.272***	−0.370**	−0.163**	−0.696***,d,e
	(0.053)	(0.115)	(0.049)	(0.111)
Variance Components				
School	0.054***	0.123***	0.057***	0.048***
Individual	0.549	0.474	0.491	0.541
Intraclass correlation	0.089	0.207	0.104	0.081

TABLE 2—continued

	Latino Children of Immigrants ($N = 1{,}300$ in 410 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}010$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 3				
Proportion Latinos in school	0.149	−0.309	−0.041	0.290
	(0.183)	(0.226)	(0.181)	(0.389)
Proportion black in school	0.094	−0.408	−0.099	−0.032
	(0.221)	(0.249)	(0.147)	(0.102)
Proportion Latino teachers	0.274	0.188	0.200	−0.700
	(0.193)	(0.291)	(0.308)	(0.961)
Intercept	−0.274***	−0.381**	−0.169**	−0.663***[d]
	(0.053)	(0.115)	(0.049)	(0.111)
Variance Components				
School	0.053***	0.127***	0.057***	0.049***
Individual	0.549	0.470	0.490	0.540
Intraclass correlation	0.088	0.213	0.104	0.083

NOTES: Standard errors displayed in parentheses. All models include controls for gender, parental education, log family income, parental educational expectations, log sibship size, single parent status, lagged test scores, parental employment status, school SES, other students' lagged test scores, region, school sector, school location (urban/suburban/rural), and school enrollment size. In addition, for the Latino samples analyses include controls for national origin, parental English proficiency, and an indicator for whether or not the child took the assessment in English. All predictors are held at the mean for Latino children.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

[a]Coefficient is significantly different between Latino children of immigrant parents and Latino children of U.S.-born parents.

[b]Coefficient is significantly different between Latino children of U.S.-born parents and white children of U.S.-born parents.

[c]Coefficient is significantly different between Latino children of immigrant parents and white children of U.S.-born parents.

[d]Coefficient is significantly different between Latino children of immigrant parents and black children of U.S.-born parents.

[e]Coefficient is significantly different between Latino children of U.S.-born parents and black children of U.S.-born parents.

TABLE 3

HLM Analysis of Effects of Latino Concentration and Latino Teachers on First Grade Reading IRT

	Latino Children of Immigrants ($N = 1{,}060$ in 390 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}000$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 1				
Proportion Latinos in school	0.245[a]	−0.342	0.110	−0.177
	0.199	0.196	0.183	0.311
Proportion black in school	0.440[a]	−0.495	−0.171[c]	−0.032
	0.235	−0.253	0.160	0.120
Intercept	−0.360***	−0.372**	−0.150*,[c]	−0.467***
	0.061	0.130	0.067	0.106
Variance Components				
School	0.067***	0.192***	0.094***	0.103***
Individual	0.588	0.461	0.498	0.535
Intraclass correlation	0.102	0.294	0.159	0.162
Model 2				
Proportion Latino teachers	0.022	−0.412[b]	0.455	−0.598
	0.226	0.259	0.262	0.723
Proportion black in school	0.281[a]	−0.411	−0.168	−0.020
	0.209	0.238	0.159	0.112
Intercept	−0.360***	−0.359**	−0.120*,[c]	−0.497***
	0.062	0.131	0.053	0.112
Variance Components				
School	0.071***	0.189***	0.094***	0.105***
Individual	0.586	0.464	0.498	0.533
Intraclass correlation	0.108	0.290	0.159	0.165

TABLE 3—continued

	Latino Children of Immigrants ($N = 1{,}060$ in 390 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}000$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 3				
Proportion Latinos in school	0.368	−0.256	−0.053	−0.032
	0.250	0.228	0.222	0.455
Proportion black in school	0.452[a]	−0.488	−0.168[c]	−0.025
	0.234	0.252	0.160	0.124
Proportion Latino teachers	−0.247	−0.200	0.518	−0.563
	0.285	0.301	0.312	0.987
Intercept	−0.364***	−0.369**	−0.127[c]	−0.499***
	0.061	0.130	0.067	0.106
Variance Components				
School	0.069***	0.191***	0.094***	0.105***
Individual	0.586	0.462	0.498	0.533
Intraclass correlation	0.105	0.293	0.159	0.165

NOTES: Standard errors displayed in parentheses. All models include controls for gender, parental education, log family income, parental educational expectations, log sibship size, single parent status, lagged test scores, parental employment status, school SES, other students' lagged test scores, region, school sector, school location (urban/suburban/rural), and school enrollment size. In addition, for the Latino samples analyses include controls for national origin, and parental English proficiency. All predictors are held at the mean for Latino children.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

[a]Coefficient is significantly different between Latino children of immigrant parents and Latino children of U.S.-born parents.

[b]Coefficient is significantly different between Latino children of U.S.-born parents and white children of U.S.-born parents.

[c]Coefficient is significantly different between Latino children of immigrant parents and white children of U.S.-born parents.

[d]Coefficient is significantly different between Latino children of immigrant parents and black children of U.S.-born parents.

[e]Coefficient is significantly different between Latino children of U.S.-born parents and black children of U.S.-born parents.

TABLE 4

HLM Analysis of Effects of Latino Concentration and Latino Teachers on First Grade General Knowledge IRT Scores

	Latino Children of Immigrants ($N = 1{,}060$ in 390 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}000$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 1				
Proportion Latinos in school	−0.015[a]	−0.594***,[b]	−0.037	−0.306
	0.151	0.149	0.111	0.229
Proportion black in school	−0.379	−0.558**,[b]	0.068	−0.197
	0.265	0.196	0.117	0.113
Intercept	−0.644***	−0.540***,[b]	−0.141**,[c]	−0.368***,[d]
	0.061	0.102	0.043	0.071
Variance Components				
School	0.076***	0.071***	0.026***	0.024***
Individual	0.580	0.342	0.332	0.465
Intraclass correlation	0.115	0.172	0.073	0.049
Model 2				
Proportion Latino teachers	0.084	−0.321	0.003	−0.654
	0.194	0.285	0.258	0.713
Proportion black in school	−0.344	−0.284	0.071	−0.164
	0.259	0.241	0.116	0.098
Intercept	−0.643***	−0.527***,[b]	−0.130*,[c]	−0.376**,[d]
	0.062	0.105	0.047	0.110
Variance Components				
School	0.076***	0.065***	0.026***	0.024***
Individual	0.580	0.273	0.332	0.464
Intraclass correlation	0.115	0.193	0.073	0.050

TABLE 4—continued

	Latino Children of Immigrants ($N = 1{,}060$ in 390 Schools)	Latino Children of U.S.-Born Parents ($N = 1{,}000$ in 530 Schools)	White Children of U.S.-Born Parents ($N = 8{,}140$ in 1,250 Schools)	Black Children of U.S.-Born Parents ($N = 1{,}560$ in 510 Schools)
Model 3				
Proportion Latinos in school	−0.090[a]	−0.666***,[b]	−0.060	−0.186
	0.200	0.180	0.170	0.336
Proportion black in school	−0.386	−0.559**,[b]	0.071	−0.192
	0.266	0.195	0.118	0.114
Proportion Latino teachers	0.151	0.166	0.068	−0.474
	0.255	0.310	0.339	0.924
Intercept	−0.642***	−0.541***,[b]	−0.139**,[c]	−0.396***,[d]
	0.062	0.102	0.043	0.095
Variance Components				
School	0.077***	0.071***	0.026***	0.024***
Individual	0.579	0.342	0.332	0.464
Intraclass correlation	0.118	0.171	0.073	0.049

NOTES: Standard errors displayed in parentheses. All models include controls for gender, parental education, log family income, parental educational expectations, log sibship size, single parent status, lagged test scores, parental employment status, school SES, other students' lagged test scores, region, school sector, school location (urban/suburban/rural), and school enrollment size. In addition, for the Latino samples analyses include controls for national origin, and parental English proficiency. All predictors are held at the mean for Latino children.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a]Coefficient is significantly different between Latino children of immigrant parents and Latino children of U.S.-born parents.
[b]Coefficient is significantly different between Latino children of U.S.-born parents and white children of U.S.-born parents.
[c]Coefficient is significantly different between Latino children of immigrant parents and white children of U.S.-born parents.
[d]Coefficient is significantly different between Latino children of immigrant parents and black children of U.S.-born parents.
[e]Coefficient is significantly different between Latino children of U.S.-born parents and black children of U.S.-born parents.

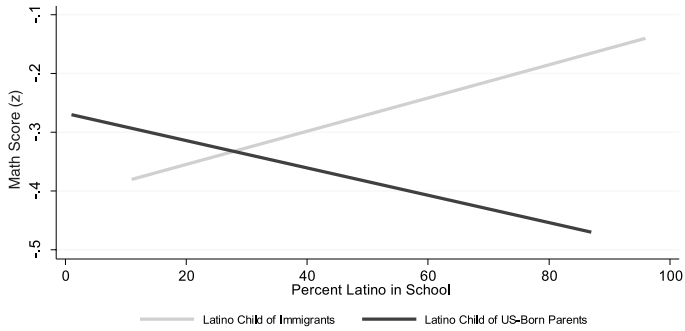
For math the effect of the proportion of Latino children in a school for Latino children of immigrant parents is positive and statistically significant, and the effects for Latino children of U.S.-born parents are negative but not statistically significant. Interpreting the coefficients indicates that if one compares a Latino child of immigrant parents to another child who is exactly the same, except one child attends a school that is one standard deviation higher on proportion Latino (26 percentage points), the child attending the school with a higher Latino presence is predicted to have math scores that are 0.08 standard deviations [$0.29 \times 0.26 = 0.08$] higher than the child attending the school with a smaller Latino presence. For reading, we see a positive effect of proportion Latino students for Latino children of immigrant parents, and a negative effect for Latino children of U.S.-born parents. While these effects are significantly different from each other, we cannot prove they are significantly different from zero.

These results for math and reading scores suggest that, in line with our expectations, coethnic concentration offers benefits for Latino immigrant families, but no real benefits for Latino families headed by U.S.-born parents. The effects are graphed in Figures 1 and 2, where we show the predicted math and reading test scores for Latino children of immigrants and Latino children whose parents were born in the United States, across the 10th through 90th percentile range of proportion of Latinos in the schools. These predicted scores are generated from the estimates from Model 1 in Table 2, and all other predictors are held at the means for the Latino children in our sample. For math, Figure 1 suggests that Latino children of immigrants have lower scores than Latino children of U.S.-born parents when Latino concentration is low (less than 25 percent), but as the Latino presence grows we see an increasing advantage for Latino children of immigrants. When a school is 80 percent Latino, Latino children of immigrants score around 0.25 standard deviations higher than Latino children of U.S.-born parents. For reading, Figure 2 shows that in schools with a very low Latino presence there is a slight advantage for Latino children of U.S.-born parents over Latino children of immigrants; but this advantage diminishes as the Latino presence in a school increases and becomes a disadvantage when a school's Latino presence reaches around 45 percent.

For general knowledge test scores, we show a somewhat different pattern. The effect of Latino concentration for Latino children of immigrants is close to zero [$\beta = -0.02 \times 0.26 = -0.01$] and not statistically significant. For children of U.S.-born parents, the effect is negative, substantial [$\beta = -0.59 \times 0.26 = -0.15$], and statistically significant. Figure 3 shows that Latino children whose parents were born in the United States have much higher general knowledge scores than children whose parents are immigrants in schools of low Latino concentration; however, this advantage diminishes as the percent of Latino students in the school increases. In schools where more than 70 percent of the students are Latino, children of immigrants tend to do slightly better on general knowledge tests. In our discussion, we offer some

FIGURE 1

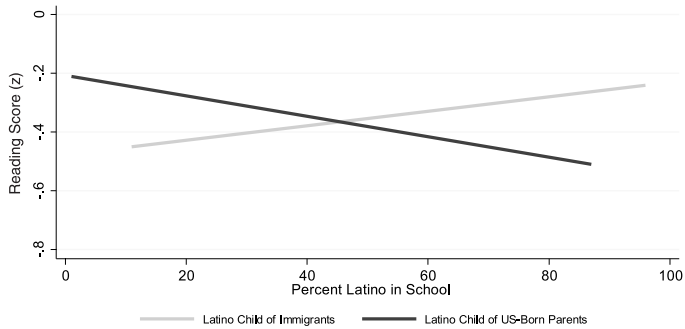
Effect of Latino Concentration on Math Scores



NOTES: Predicted outcomes graphed for the 10th–90th percentile range for each group, and calculated from Model 1 in Table 2. All predictors held at means for Latino children.

FIGURE 2

Effect of Latino Concentration on Reading Scores



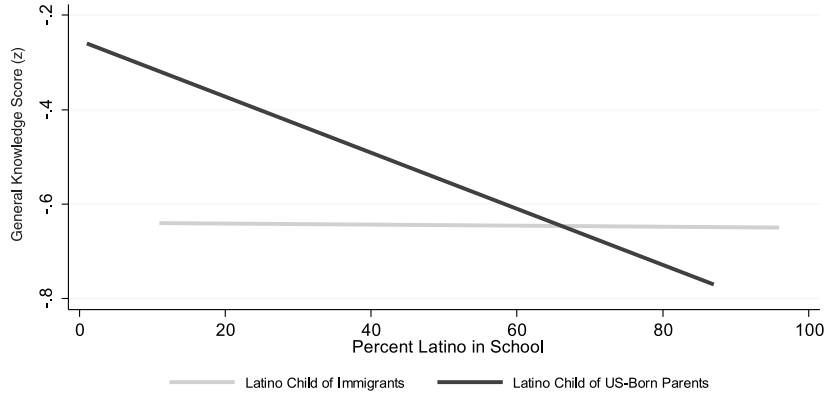
NOTES: Predicted outcomes graphed for 10th–90th percentile range for each group, and calculated from Model 1 in Table 3. All predictors held at means for Latino children.

speculations as to why Latino concentration has different effects for general knowledge than for reading or math.

We next examine the relationship between the proportion of Latino teachers in the school and test scores, and whether it mediates any of the association between Latino student concentration and test scores. We find that the benefit of Latino presence in schools on the math test scores of Latino children of immigrants appears to reflect the benefits of attending school with Latino teachers. In Model 2, the proportion of Latino teachers has a significant and positive effect on math scores for Latino children of immigrants [$\beta = 0.37 \times 0.14 = 0.05$], but no significant effect for Latino children of U.S.-born parents.

FIGURE 3

Effect of Latino Concentration on General Knowledge Scores



NOTE: Predicted outcomes graphed for 10th–90th percentile range for each group, and calculated from Model 1 in Table 4. All predictors held at means for Latino children.

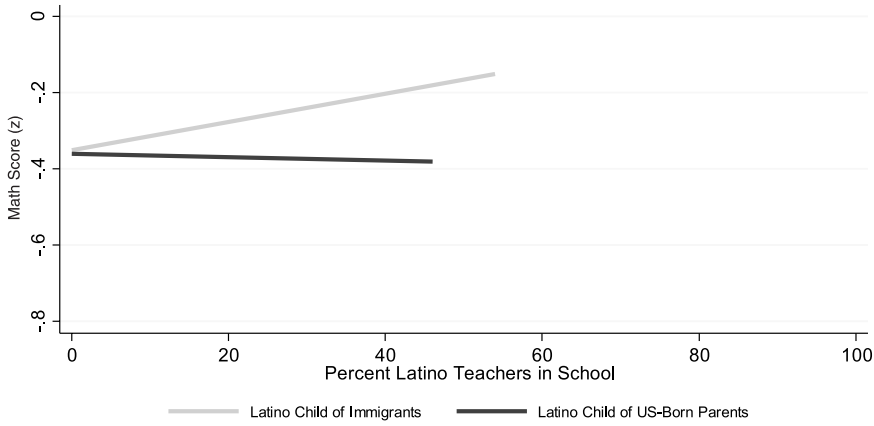
This is shown in Figure 4. Moreover, when we control for both proportion Latino students and proportion Latino teachers in Model 3, the presence of Latino teachers has the stronger effect of the two (although neither are statistically significant). Even though the proportion of Latino teachers exerts a significant influence on math scores, the proportion of Latino teachers in the school has no effect on reading test scores for either children of immigrants or children whose parents were born in the United States. The presence of Latino teachers also has little influence on the general knowledge scores of Latino children of immigrant parents, and it has a small but nonsignificant negative effect for Latino children of U.S.-born parents. In Model 3, the negative effect of the proportion of Latino students on the test scores of children of U.S.-born parents increases in magnitude, and the effect of Latino teachers reverses sign and remains nonsignificant, indicating that the negative effect of Latino presence found earlier is not explained by Latino teachers.

We believe the beneficial effect of Latino teachers on math scores for Latino children of immigrants represents the benefits of social capital inhering in coethnic ties between parents, children, and school staffers and teachers rather than a benefit of having a teacher of the same race. In models not presented here, we estimated the effect of having a first-grade Latino teacher; this predictor had no significant effect for any outcome for Latino children of immigrants at the 0.10 level; the only significant effect was a marginally significant one for the math scores of Latino children of U.S.-born parents.

In all likelihood, our estimates of the effects of Latino concentration and Latino teachers for the reading and general knowledge scores of Latino children of immigrants are biased downward. A fifth of the sample of children of

FIGURE 4

Effect of Latino Teachers on Math Scores



NOTES: Predicted outcomes graphed for 10th–90th percentile range for each group, and calculated from Model 2 in Table 2. All predictors held at means for Latino children.

immigrants (as opposed to one percent of the sample of Latino children of U.S.-born parents) had low levels of English proficiency and took the math assessment in Spanish and were excluded from the reading and general knowledge assessments (which were conducted in English only). In Table 5, we compare results for math scores for *all* Latino children of immigrants and for just those Latino children of immigrants who took the math assessment in English. The benefits of Latino concentration and Latino teachers are substantially weaker (and nonsignificant) for children of immigrants who took the English assessment. This indicates that coethnic concentration and coethnic teachers are especially beneficial for children experiencing sharp home-school discontinuities; unfortunately such children are by necessity excluded from our analyses of reading and general knowledge scores.

Although it is not a focus of our article, it is worth mentioning the effects of proportion black in a school. For the most part, proportion black does not have significant effects for Latino children. The only exception is a significant negative effect for the general reading scores of Latino children of U.S.-born parents. In addition, the effect of proportion black is significantly different for reading scores: it is positive (but not significant) for Latino children of immigrants, and negative (but not significant) for Latino children of U.S.-born parents.[7] The negative effects of a concentration of African-American children for Latino children is in line with the concerns of segmented assimilation

[7]We also assess whether the impact of proportion Latino students is conditional upon the proportion of African-American students by including an interaction between the two measures in our multivariate models (not shown). For all outcomes, and for both Latino

TABLE 5

Full HLM Results for Effects of Latino Concentration and Latino Teachers on Latino Children's Math Scores

	Model 1			Model 2			Model 3		
	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)
Intercept	−0.28***	−0.38**	−0.25***	−0.27***	−0.37**	−0.24***	−0.27***	−0.38**	−0.27***
	(0.05)	(0.12)	(0.05)	(0.05)	(0.12)	(0.05)	(0.05)	(0.12)	(0.05)
Proportion Latino in school	0.29*,[a]	−0.23	0.21				0.15	−0.31	0.14
	(0.14)	(0.19)	(0.16)				(0.18)	(0.23)	(0.18)
Proportion Latino teachers				0.37*	−0.05	0.25	0.27	0.19	0.16
				(0.15)	(0.23)	(0.16)	(0.19)	(0.29)	(0.19)
Proportion black	0.11	−0.41	0.04	0.02	−0.30	−0.03	0.09	−0.41	0.13
	(0.22)	(0.25)	(0.24)	(0.21)	(0.23)	(0.23)	(0.22)	(0.25)	(0.22)
School SES	0.03	−0.01	0.10	0.01	0.01	0.08	0.02	−0.01	0.01
	(0.06)	(0.08)	(0.06)	(0.05)	(0.08)	(0.05)	(0.06)	(0.08)	(0.06)
Catholic	−0.01	0.14	−0.12	0.01	0.13	−0.11	0.00	0.14	0.00
	(0.11)	(0.12)	(0.10)	(0.11)	(0.12)	(0.10)	(0.11)	(0.12)	(0.11)
Other private	0.01	−0.01	−0.16	0.00	−0.01	−0.15	−0.01	−0.02	−0.03
	(0.17)	(0.18)	(0.19)	(0.17)	(0.18)	(0.19)	(0.17)	(0.18)	(0.17)
Location (Reference = Suburb)									
Urban	−0.15*	−0.11	−0.08	−0.16*	−0.13	−0.09	−0.16*	−0.12	−0.18*
	(0.07)	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)	(0.08)	(0.07)
Rural	0.01	−0.16	0.06	−0.03	−0.14	0.02	−0.01	−0.17	0.00
	(0.16)	(0.17)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.17)	(0.15)
School enrollment	−0.01	0.00	−0.01	−0.01	0.00	−0.01	−0.01	0.00	−0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)

TABLE 5—continued

	Model 1			Model 2			Model 3		
	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)
Region (Reference = South)									
Northeast	−0.50***	−0.32*	−0.52***	−0.49***	−0.32*	−0.52***	−0.49***	−0.32*	−0.47***
	(0.10)	(0.13)	(0.10)	(0.10)	(0.13)	(0.10)	(0.10)	(0.13)	(0.10)
Midwest	−0.39**	−0.27*	−0.33*	−0.37**	−0.25*	−0.33*	−0.37**	−0.26*	−0.34*
	(0.13)	(0.11)	(0.13)	(0.14)	(0.11)	(0.14)	(0.14)	(0.11)	(0.14)
West	−0.34***	−0.24*	−0.28**	−0.33***	−0.26**	−0.28**	−0.33***	−0.24*	−0.30***
	(0.08)	(0.09)	(0.08)	(0.08)	(0.10)	(0.08)	(0.08)	(0.10)	(0.08)
National Origin (Reference = Mexican)									
South American	0.02	0.57	0.15	0.03	0.57	0.15	0.03	0.57	0.03
	(0.13)	(0.36)	(0.11)	(0.13)	(0.36)	(0.11)	(0.13)	(0.36)	(0.14)
Central American	−0.04	0.11	−0.02	−0.04	0.10	−0.02	−0.03	0.10	0.00
	(0.09)	(0.35)	(0.10)	(0.09)	(0.35)	(0.10)	(0.09)	(0.35)	(0.10)
Cuban	0.08	0.15	0.02	0.08	0.12	0.03	0.08	0.15	0.11
	(0.14)	(0.18)	(0.14)	(0.14)	(0.18)	(0.14)	(0.14)	(0.18)	(0.14)
Puerto Rican	−0.05	−0.16	0.03	−0.05	−0.16	0.02	−0.05	−0.15	−0.02
	(0.13)	(0.11)	(0.13)	(0.13)	(0.11)	(0.13)	(0.13)	(0.11)	(0.13)
Unspecified	−0.04	−0.02	−0.03	−0.04	0.00	−0.03	−0.03	−0.01	−0.01
	(0.25)	(0.08)	(0.23)	(0.24)	(0.08)	(0.23)	(0.24)	(0.08)	(0.25)
Female	−0.01	−0.14*	0.02	−0.01	−0.14*	0.02	−0.01	−0.14*	−0.02
	(0.05)	(0.07)	(0.05)	(0.05)	(0.07)	(0.05)	(0.05)	(0.07)	(0.05)

TABLE 5—continued

	Model 1			Model 2			Model 3		
	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)
Parental Education (Reference = No College)									
Some college	0.11	0.21**	0.18**	0.11	0.21**	0.18**	0.11	0.21**	0.12
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Bachelors or higher	0.22*	0.09	0.18*	0.21*	0.08	0.17*	0.21*	0.08	0.21*
	(0.10)	(0.10)	(0.08)	(0.10)	(0.10)	(0.08)	(0.10)	(0.10)	(0.10)
Log income	−0.04	0.10	0.02	−0.03	0.10	0.02	−0.03	0.10	−0.02
	(0.04)	(0.06)	(0.04)	(0.04)	(0.06)	(0.04)	(0.04)	(0.06)	(0.04)
Parental Educational Expectations (Reference = Less than Bachelors)									
Bachelors	0.09	−0.05	0.15	0.09	−0.05	0.15	0.08	−0.05	0.10
	(0.09)	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)	(0.09)	(0.10)	(0.08)
Post-Bachelors	0.15	0.03	0.25*	0.16	0.02	0.26*	0.15	0.03	0.17*
	(0.08)	(0.12)	(0.10)	(0.08)	(0.12)	(0.10)	(0.08)	(0.12)	(0.08)
Single parent	−0.14[a]	0.15	−0.11[a]	−0.14[a]	0.14	−0.11[a]	−0.14[a]	0.15	−0.13[a]
	(0.08)	(0.10)	(0.07)	(0.08)	(0.10)	(0.07)	(0.08)	(0.10)	(0.08)
Log sibship size	−0.10	0.04	−0.10	−0.10	0.04	−0.10	−0.10	0.04	−0.10
	(0.06)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)	(0.07)	(0.06)
Parent not employed	0.06	0.00	0.03	0.06	0.00	0.03	0.06	0.00	0.05
	(0.06)	(0.08)	(0.06)	(0.06)	(0.08)	(0.06)	(0.06)	(0.08)	(0.06)

TABLE 5—continued

	Model 1			Model 2			Model 3		
	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)	Latino Children of Immigrants	Latino Children of U.S.-Born Parents	Latino Children of Immigrants (English Assessment Only)
Parent English Proficiency (Reference = Native Speaker)									
Well	−0.08	0.06	−0.10	−0.09	0.05	−0.11	−0.09	0.06	−0.08
	(0.12)	(0.08)	(0.11)	(0.12)	(0.08)	(0.11)	(0.12)	(0.08)	(0.13)
Not well	−0.17	−0.30	−0.15	−0.18	−0.32	−0.16	−0.17	−0.30	−0.20
	(0.12)	(0.38)	(0.10)	(0.12)	(0.39)	(0.10)	(0.12)	(0.38)	(0.13)
Lagged test score	0.68***	0.56***	0.61***	0.67***	0.56***	0.61***	0.67***	0.56***	0.70***[a]
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Other students' lagged test scores	−0.03	0.02	−0.07	−0.04	0.03	−0.08	−0.03	0.02	−0.03
	(0.05)	(0.07)	(0.04)	(0.05)	(0.07)	(0.04)	(0.05)	(0.08)	(0.05)
English assessment	−0.31**	0.18		−0.32**	0.17		−0.32**	0.16	
	(0.10)	(0.56)		(0.10)	(0.55)		(0.10)	(0.56)	

NOTES: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a]Effect is significantly different from that for Latino children of U.S.-born parents, $p < 0.05$.

theory that the descendants of immigrants are harmed by an "oppositional culture" supposedly existing among black youth, although as we noted before there are strong grounds to be skeptical of this interpretation (Ainsworth-Darnell and Downey, 1998; Harris, 2006, 2008; Tyson, 2011). It could be that schools with African-American youths tend to suffer from social disorganization and a lack of social capital (Condron, 2009; Fryer and Levitt, 2004; Goldsmith, 2011), which harms Latino children of U.S.-born parents. Why would these negative effects be absent for Latino children of immigrants? Greenman (2011) argues that immigrant parents may be more likely to intensify their monitoring and supervision of their children when their children attend school with other disadvantaged youth; it could be that Latino immigrant parents are reacting to the presence of black students in their children's schools.

Effects of Latino School Concentration for Non-Latino Children of U.S.-Born Parents

Examining the effects of Latino school concentration and Latino teachers for non-Latino children in families headed by U.S.-born parents can help us understand the reasons why Latino school concentration and teachers may have benefits for Latino children of immigrant parents. If there are no effects of Latino student concentration or Latino teachers for non-Latino children, this would suggest that the positive effects for Latino children of immigrants are owing to coethnic social ties, which we theorized facilitated collective, positive feelings toward school and greater levels of social capital. On the other hand, if there are benefits of Latino student concentration or teachers for non-Latino children, this raises the possibility that coethnic ties are not producing these benefits, but rather that Latinos attend schools with unmeasured practices that benefit a broad spectrum of students. We will also be able to determine if there are differences between Latino and white children of U.S.-born parents, which we would expect based on the insights of segmented assimilation theory.

The effects of Latino concentration for non-Hispanic African-American and white children of U.S.-born parents are also presented in Tables 2–4. For all three outcomes, the effects of Latino student concentration and Latino teachers are not statistically significant for either group. Thus, our evidence indicates that the benefits of Latino students and teachers are unique to Latino children of immigrants, and these benefits are a result of coethnicity. We also note that the substantial negative effect of Latino concentration for the general knowledge scores of Latino children of U.S.-born parents is significantly different from the effect for white children, which is close to zero.

children of immigrants and Latino children of U.S.-born parents, the interaction terms were not statistically significant, suggesting that Latino student concentration does not vary by the proportion of other non-White students.

Assessing Possible Selectivity Bias

Frank (2000) formulated the ITCV, which has been used by other researchers to determine the robustness of their causal inferences (Cheng, Martin, and Werum, 2007; Crosnoe, 2009). The ITCV is calculated for specific predictors, and represents the product of two partial correlations: the partial correlation between the predictor and a hypothetical confound; and the partial correlation between the outcome and the hypothetical confound. Controlling for a confound that has higher partial correlations with the predictor and outcome than those indicated by the ITCV would result in the predictor becoming nonsignificant.

We calculated ITCVs for the three associations that were significant in our main analysis: the positive association between Latino concentration and the math scores of Latino children of immigrants; the positive association between Latino teachers and the math scores of Latino children of immigrants; and the negative association between Latino concentration and the general knowledge scores of Latino children of U.S.-born parents. We used OLS regression with clustered standard errors. We accounted for the clustering of students within schools by calculating a design effect (the ratio of the adjusted standard error for the predictor to the unadjusted standard error). We multiplied the t statistic needed for a significant result (at the 0.05 level) by this design effect. We calculated the ITCVs for each imputation, converted them into z-scores using Fisher's transformation, averaged them, and converted the average back into the ITCV.

Table 6 presents the ITCVs for the three effects. For the positive association between Latino concentration and the math scores of Latino children of immigrants, we obtained an ITCV of 0.0077. This means that a hypothetical confound would need to have a partial correlation of at least 0.088 [sqrt(0.0077) = 0.088] with proportion Latino and the outcome, in order to render the association of proportion Latino with math scores nonsignificant (alternatively, both partial correlations could also be below −0.088 for a confound to exceed the ITCV).

It is hard to evaluate ITCVs in and of themselves, so we compare the ITCVs to impact ks for all other control variables in the model. Impact ks are the product of the control variable's partial correlation with the predictor (in this case, Latino concentration) and the control variable's partial correlation with the outcome (in this case, math scores).[8] Because we are primarily concerned with the selection bias caused by Latino parents strategically choosing to send their children to specific schools with a Latino concentration, we compare the ITCV to the impact ks for child-level predictors. None of the impact ks approach 0.0077; the closest is lagged test scores, which has an impact k of 0.0046. This indicates it is unlikely there is a confound that has partial

[8]Impact ks were calculated for each imputation, converted into z-scores using Fisher's transformation, averaged across imputations, and converted back into impact ks.

TABLE 6

Analysis of Impact Thresholds for a Confounding Variable

Variable	Latino Children of Immigrants — Math			Latino Children of U. S.-Born Parents — General Knowledge	
	ITCV[a]	Impact k[b] (Proportion Latino)	Impact k[b] (Proportion Latino Teachers)	ITCV[a]	Impact k[b] (Proportion Latino)
Proportion Latino in school	0.0077			−0.0376	
p value (out of 17/18 student-level predictors)	<0.0556			<0.1176	
Proportion Latino teachers	0.0068				
p value (out of 17/18 student-level predictors)	<0.1111				
Student-Level Controls					
Latino Nationality (Reference = Mexican)					
Nationality Unknown		0.0022	0.0015		−0.0112
South American		0.0000	0.0000		−0.0001
Central American		0.0025	0.0020		0.0002
Cuban		−0.0003	−0.0001		−0.0012
Puerto Rican		0.0024	0.0018		−0.0015
Female		−0.0001	0.0002		0.0011
Parents' Education (Reference = High School or Less)					
Some college		0.0031	0.0008		0.0016
BA or higher		0.0024	0.0045		0.0025
Log income		0.0008	0.0014		0.0039

TABLE 6—continued

Variable	Latino Children of Immigrants — Math — ITCV[a]	Latino Children of Immigrants — Math — Impact k[b] (Proportion Latino)	Latino Children of Immigrants — Math — Impact k[b] (Proportion Latino Teachers)	Latino Children of U. S.-Born Parents — General Knowledge — ITCV[a]	Latino Children of U. S.-Born Parents — General Knowledge — Impact k[b] (Proportion Latino)
Parents' Educational Expectations (Reference = Less than BA)					
Baccalaureate		0.0022	0.0020		−0.0005
Graduate degree		0.0043	0.0032		0.0017
Single parent		−0.0008	−0.0004		0.0023
Log sibship size		−0.0007	−0.0006		0.0006
Parent not employed		−0.0025	−0.0030		0.0015
Parental English Ability (Reference = Native Speaker)					
Well		−0.0004	−0.0016		−0.0033
Not well		−0.0009	−0.0031		−0.0043
Lagged test scores		0.0046	0.0359		−0.0383
Spanish assessment		−0.0152	−0.0234		

[a]ITCV calculated for $a = 0.05$.
[b]Impact ks are the product of two partial correlations: one between proportion Latino and the covariate, the other between the outcome and the covariate.

correlations greater than 0.088 with Latino concentration and math scores, and we can say the probability of such a confound existing is less than 0.056 (less than 1 out of 18 child-level predictors).

For the positive association between Latino teachers and math scores for Latino children of immigrants, we have an ITCV of 0.0068, indicating that a hypothetical confound would need to have a partial correlation greater than 0.082 with Latino teachers and math scores in order to render this effect nonsignificant. In this case, we have a child-level predictor that has an impact *k* substantially greater than 0.0068: lagged test scores, at 0.036. This indicates we can say the probability of a confound exceeding the ITCV is less than 0.111 (less than 2 out of 18 child-level predictors).

For the negative association between Latino concentration and general knowledge scores for Latino children of U.S.-born parents, we calculated an ITCV of −0.0376, which means that a confound would need to have a negative partial correlation of 0.194 with Latino concentration, and a positive partial correlation of 0.194 with the outcome to exceed the ITCV (of course, the confound could have a positive partial correlation with Latino concentration and a negative partial correlation with the outcome to exceed the ITCV). Again, lagged test scores is a predictor with an impact *k* below −0.0376, meaning that we can say the probability of a confound exceeding the ITCV is less than 0.118 (less than 2 out of 17 child-level predictors).

The results from the analysis of ITCVs are mixed. While the ITCV for the association between the math scores of Latino children of immigrants and Latino student concentration is small (0.0077), the results suggest it is unlikely that a hypothetical confound exists which has an impact *k* greater than the ITCV. This increases our confidence that Latino concentration affects math scores for Latino children of immigrants. For the other two associations, the impact *k* of lagged test scores exceeds the ITCVs, indicating a greater plausibility the associations reflect a selection process. Some Latino immigrant families may select into schools with more Latino teachers, but the characteristics that lead them to select into such schools may also be beneficial for their children's math test scores. Likewise, Latino nonimmigrant families may select into schools with a *small* Latino concentration, and the characteristics leading them to select into such schools may be beneficial for their children's general knowledge scores.[9]

[9]We have school-level predictors with impact *k*s exceeding the ITCV for the associations between math scores of Latino children of immigrants (on the one hand) and Latino concentration and Latino teachers (on the other). We do not believe that these are cause for concern; they represent the fact that alternative measures of social context would render the effects of Latino concentration and Latino teachers nonsignificant (as indeed happens when we control for both Latino concentration and Latino teachers in the same model). This does not undermine our central contention that context matters for Latino children of immigrants.

Discussion

This study evaluates the effects of the proportion of Latino students and Latino teachers on the math, reading, and general knowledge test scores of Latino first grade children, as well as the possibility that these effects vary by nativity status. Informed by prior research suggesting that a large Latino presence in schools produces a concentration of immigrant optimism, as well as social capital benefits of coethnic communities, we expected to see benefits for Latino children of immigrants but fewer benefits for Latino children of U.S.-born parents. Our results for math scores (and to a lesser extent reading scores) conform to this pattern. We see moderate advantages to a large Latino presence in schools for Latino children of immigrants and no significant effects for Latino children of U.S.-born parents. Moreover, because we do not see a benefit of Latino presence for African-American and white children of U.S.-born parents, we infer that the advantages of coethnic concentration for Latino children of immigrants most likely have to do with coethnic social ties and coethnic social capital.

For general knowledge tests we found a different pattern: coethnic concentration harms the scores of Latino children of U.S.-born parents and has no effect for Latino children of immigrants. While the results are in line with our expectation that the effects of coethnic concentration are more positive (less negative) for children of immigrants, the negative effect for children of U.S.-born parents is somewhat puzzling. We suspect that performance on the general knowledge test is tapping more into children's possession of cultural capital than are the reading and math tests. Valenzuela (1999), who did ethnographic research on Mexican immigrant and Mexican-American adolescents in a high school, argues that while Latino adolescents, regardless of nativity, embrace education, Mexican-American adolescents become alienated from their educators because of perceptions that their teachers devalue their culture. The immigrant optimism of Mexican immigrant adolescents, however, may serve to counteract the harmful effects of this alienation. This argument could be applied to Latino families with young children; perhaps a concentration of Latinos in elementary schools leads to a devaluation of the kinds of knowledge rewarded on the "general knowledge" test among Latino families headed by U.S.-born parents, but this devaluation does not occur for fundamental skills such as reading or math because of respect for education. This explanation would also lead us to expect that a Latino concentration would not harm the general knowledge scores of white children of U.S.-born parents, which is precisely what we see in our results. Further research is needed to test these speculations.

Although some U.S. educators oppose their students expressing identification with Latino groups (Valenzuela, 1999), our results suggest that coethnic communities can be a valuable source of social capital, particularly for immigrant families, and these coethnic communities are not incompatible with educational success. Our results are in line with the expectations of assimilation

theories that the benefits of coethnic communities dissipate with each successive generation, as evidenced by the fact that Latino children of U.S.-born parents do not benefit from coethnic concentration. But the negative effect of coethnic concentration for the general knowledge scores of Latino children of U.S.-born parents does reflect the insight of segmented assimilation theory in particular that barriers still exist for the descendants of nonwhite immigrants.

While we show some benefits of Latino concentration for Latino children of immigrant parents, we do not recommend that researchers and policymakers be sanguine about the segregation and racial isolation of Latino students that currently exist. As we show here, there are potential drawbacks to Latino concentration for Latino children of U.S.-born parents. Furthermore, even if there were no drawbacks to segregation for test scores in the early years of elementary school, researchers point out that segregation can have negative consequences for long-term outcomes, such as educational and occupational attainment (Goldsmith, 2009; Wells and Crain, 1994; Charles, Dinwiddie, and Massey, 2004). The lesson we take from our results is that, rather than segregate Latino students, scholars, educators, and policymakers should instead try to figure out why some groups do better in Latino concentrated schools, in order to better understand how to improve the schooling experiences of all disadvantaged groups. Our findings suggest that one way would be to hire teachers and staffers of Latino ancestry (who are possibly immigrants themselves; see Gibson and Hidalgo, 2009) who would be better positioned to establish supportive relationships with Latino children of immigrants. However, more broadly our results indicate that school staff need to work with students and parents to promote a sense of community within the school, so that the benefits of social capital accrue to all families, regardless if they are in the majority or not.

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