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English Proficiency and Peer Interethnic Relations as Predictors of Math Achievement among Latino and Asian Immigrant Students

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Abstract

Studies show math achievement to be the best predictor of entering post-secondary education. However, less is known about the predictors of math achievement, particularly among immigrant youth. This study examined English proficiency and peer interethnic relations as predictors of mathematics achievement among Latino and Asian high school students, postulating an interaction between the predictors and mediation by academic motivation. A multilevel moderated-mediation model was used to analyze data from a national sample of 2,113 non-native English speaking Latino and Asian students attending high school in the U.S. We found that higher academic motivation mediated the relationship between English proficiency during their sophomore year and gains in senior math achievement scores for both Asian and Latino students. For Latino students however, this indirect path was only significant for students whose perceptions of positive peer interethnic relations at school were average or above average.

Keywords

Math achievement; Academic motivation; Interethnic relations; English proficiency; Immigrant adolescents; Multilevel modeling

While troubling math and reading achievement gaps between European American and African American youth in the United States have presented a clear education disparity spanning several decades (Nord et al., 2011), the achievement gap literature on U.S. immigrant youth has been more limited. Both of these ethnic groups tend to undergo a difficult adjustment process stemming from their migration and acculturation experiences, including stress related to language barriers (Portes & Rumbaut, 2001; Hune & Takeuchi, 2008; Suarez-Orozco, Pimentel, & Martin, 2009). In the United States, 11.2 million immigrant youth live in homes where a language other than English is dominant, and 2.7 million of such youth themselves have limited English proficiency (LEP) (Aud et al., 2011).

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Latinos and Asians constitute the current majority of this population: they compose 47% and 25%, respectively, of the U.S. foreign-born population and 6.1% and 3.2% of the total population (Batalova & Lee, 2012). However, adolescents of the two groups have experienced different rates of academic success, with Asians, on average, tending to outperform Latinos.

In mathematics, the subject most strongly correlated with entering post-secondary education (Scott & Ingels, 2007), Latinos generally fare worse than European Americans and sometimes worse than African Americans. Asian youth, however, collectively perform better¹ than European Americans in mathematics (The College Board, 2010; Nord et al., 2011)). For example, according to the College Board (2010), the average SAT math score for Latinos was 465 compared to a national average of 516 and an average of 591 for Asian students. Of the many factors underlying this gap, factors specific to the first and second immigrant generations and their ethnic minority status are particularly worthy of closer examination as they are relevant to both Asian and Latino youth.

The purpose of the present study was to explore the differential success rates of non-native English speaking Latinos and Asians by examining how their level of English proficiency and perceived interethnic relations between their peers may interact to influence student academic motivation and student math achievement. Of particular interest was whether those associations differed between Asian and Latino students. Using a large, nationally representative sample of the Educational Longitudinal Study (2002), we tested a multi-level moderated-mediation model on both Asian and Latino, non-native English speaking high school students to examine whether it may help explain these groups' differential math achievement rates.

Academic Motivation as a Key Achievement Predictor

Academic motivation has long been considered a key component and precursor for academic success (Bandura, 1977; Chen & Stevenson, 1995; Harter, 1981; Meece, Wigfield, & Eccles, 1990; Pajares & Graham, 1999; Portes, 1999; Suarez-Orozco, Pimentel, & Martin, 2009). Our definition of academic motivation is based upon the expectancy-value model of motivation (Eccles, 1983; Wigfield & Eccles, 2000). The Expectancy-value model, originally developed in relation to math achievement, takes into account a range of social and developmental determinants of motivation, focusing on an individual's expectations of success, the value he or she places on a given task, and their achievement related choices. For the current study, we define motivation as the subjective value an individual places on a task (how important it is to do it well, and to which extent doing so is useful for the future) in conjunction with achievement-related choices (academic efforts made to achieve).

The educational and psychological literature has strongly supported student academic motivation as an instrumental driver of academic achievement, including math achievement, across various ethnic groups (Bandura, 1977; Chen & Stevenson, 1995; Harter, 1981; Meece et al, 1990; Pajares & Graham, 1999; Portes, 1999; Suarez-Orozco, Pimentel, & Martin, 2009). Academic motivation has also been identified as one of the key psychosocial determinants of grade-point average, a strong predictor of math scores across subsequent school years, and an indicator of students' intentions to enroll in further mathematics courses (Portes 1999; Meece et al., 1990). When examining the academic motivation of immigrant youth, two key factors might be taken into account, namely English proficiency

¹Although Asian Americans, as a whole, outperform other ethnic/racial groups, there is significant variability amongst Asians in their mathematics achievement and aptitude scores. For example, many Southeast Asians, some of whom come from refugee families, face more obstacles to educational success (Ngo & Lee, 2007; Yang, 2004). Latinos similarly exhibit considerable variability in their academic outcomes (Portes & Rumbaut, 2006).

and peer interethnic relations. The quality of both a young immigrant's English capacities as well as his or her peer relations in a multi-ethnic environment may work to motivate or demotivate their academic performance.

Limited English Proficiency

Limited English proficiency has been linked to both academic achievement and motivation in previous studies (Cohen, Deterding, & Clewell 2005; Suarez-Orozco et al., 2009). Among Latinos in particular, LEP has generally been linked to lower achievement outcomes in mathematics and language arts (Eamon, 2005; Padilla & Gonzales, 2001; Suarez-Orozco et al., 2009), a logical consequence of students' limited comprehension in academic settings where teaching is primarily in English. Whether these relationships are similar for Asian youth, however, is made unclear by contradictory findings: some studies find Asians to perform well mathematically despite LEP, whereas other studies have identified academic weaknesses in all areas among Asians with LEP (Bradby, 1992; Tate, 1997; Wang & Goldschmidt, 1999).

There is also evidence for a link between English proficiency and academic motivation, which might mediate the link between English proficiency and achievement. For example, Portes and Rumbaut (2001), Alva (1993), and Suarez-Orozco and colleagues (2009) found English proficiency to be associated with behavioral engagement, educational aspirations, and perceptions of possibilities of upward mobility. This makes sense considering that English proficiency is generally thought important for reaching the upper rungs of the American societal ladder – a reality that high school students are likely aware of and on which they assess their own potential for success. Moreover, LEP can prevent them from easily negotiating their school environment and contribute to feelings of isolation (Suarez-Orozco et al., 2009). Such sentiments may be accompanied by anxiety and low self-esteem (Alva, 1993; Rumbaut, 1994; Hune & Takeuchi, 2008), all of which can work to demotivate an individual from making their strongest academic effort (Rumbaut, 1994). LEP students are also often stigmatized and teased (Rumbaut, 1994) and tend to be members of first and second-generation immigrant groups. The importance of peer interactions during adolescence, as well as the additional relevance that race plays in the lives of ethnic minorities such as Latinos and Asians, leads us to further examine the role of peer interethnic relations as a potential predictor of motivation and subsequent achievement.

Peer Interethnic Relations

Similarly to English proficiency, the interethnic dynamics of diverse school environments have been thought to influence immigrant students' academic motivation and their achievement (Alfaro et al., 2009; Green et al., 1988; Suarez-Orozco et al., 2009; Wigfield et al., 2007; Wong et al., 2003). Latino and Asian students affected by a generally poor racial climate in their schools, being subject to discrimination, physical and verbal violence, and stereotypes related to gang associations, tend to develop a lower sense of school belonging, depression, and feelings of powerlessness (Hune & Takeuchi, 2008; Hurtado & Carter, 1997; Suarez-Orozco et al., 2009; Teranishi, 2002). Such feelings, in turn, can lower these students' self-esteem and decrease their academic motivation (Goodenow & Grady, 1993; Ibañez, Kuperminc, Jurkovic, & Perilla, 2004; Sánchez, Colón, & Esparza, 2005). In contrast, school-based supportive relationships and a sense of being accepted by other ethnic groups have been shown to enhance both immigrants' behavioral and cognitive engagement, perhaps leading to higher overall student GPAs (Suarez-Orozco et al., 2009). These studies suggest that peer interethnic relations are an important factor influencing immigrant youth's academic motivation and subsequent success, and that conflict between ethnic groups may negatively impact performance if it is not met with resilience.

In the present study, we chose to focus specifically on immigrants' perceptions of interethnic relations between their peers. Our definition of interethnic relations is borrowed from Green, Adams, and Turner's (1988) school interracial climate scale, in which "interracial associations," are defined as the degree to which interactions between different ethnic groups facilitate the development of interethnic friendships. Although peer interethnic relations are only one part of the racial climate measured in much of the previously discussed literature, there is also evidence supporting a separate examination of these perceived relations. Factorial analysis of the different dimensions of racial climate has indicated that these dimensions do not all correlate with the same outcomes, making their individual examination important from a theoretical standpoint (Chavous, 2005). Moreover, the importance of positive interethnic peer relationships in facilitating academic success stands out in previous studies of immigrant youth (Suarez-Orozco et al., 2009, Hune & Takeuchi, 2008) to the extent that it merits attention as an important variable in its own right. In the present study, we chose to examine how these perceived interethnic peer relations may work in conjunction with English proficiency to influence immigrants' academic motivation and achievement, thereby beginning to fill several research gaps.

Remaining Research Gaps

Although varying levels of English proficiency characterize participants of most of the discussed studies on racial climate and interethnic relations, research on how these proficiency levels interact with racial climate or peer interethnic relations perceptions is scarce. The generally accepted reasoning underlying English language programs for immigrant youth is the importance of English for these adolescents to be able to achieve academically and adapt to function in American society. Research confirms that these desired outcomes are indeed likely (Eamon, 2005; Suarez-Orozco et al., 2009) and that one important way they are achieved is through the increased amount of opportunities that English-proficient adolescents perceive for themselves in the future, likely contributing to their becoming more motivated (Alva, 1993; Suarez-Orozco et al., 2009). However, we suspect that if perceived peer interethnic relations in their schools are negative, learning English alone will not be enough. The literature suggests several ways in which interethnic relations may moderate motivational progress made due to learning English. Unequal treatment by peers could plausibly lower students' sense of school belonging, which may de-motivate them (Ibañez et al., 2004) despite possessing strong English skills. Also, with this unequal treatment being potentially due to ones' skin color and/or stereotypes associated with it, stereotype threat could decrease students' self-esteem and diminish the perceived opportunities they thought attainable based on good English, decreasing future aspirations and current academic efforts (Kumar & Maehr, 2010; Ogbu, 1994; Steele, Spencer, & Aronson, 2002; Van Laar, 2000; Wong et al, 2003).

Secondly, the diverse ethnic groups included in the research on English proficiency, interethnic relations, motivation and achievement have rarely been compared. Considering the divergent academic outcomes of Latino and Asian youth, such comparisons are necessary for an understanding the generalizability or cultural specificity of processes that facilitate the academic success, or lack thereof, immigrant youth. The present study hence attempted such an in-depth comparison between non-native English speaking Latino and Asian youth.

Current Investigation

In the present study, we tested a longitudinal, multi-level model in which 10th grade English proficiency was related to student academic motivation, which in turn predicted math achievement in the 12th grade. Furthermore, we examined whether peer interethnic relations,

both as perceived individually and collectively at the school-level, moderated the associations between English proficiency, academic motivation and math achievement outcomes. These research questions were examined using a national sample of both Asian and Latino, non-native English speakers to determine whether there were ethnic group differences in the hypothesized model pathways that might explain differences in their achievement. We hypothesized that (1) higher English proficiency would be related to higher rates of academic motivation, and (2) the association between English proficiency and academic motivation would depend upon the students' perceptions of peer interethnic relations, with perceived negative relations weakening the association while positive relations would strengthen it. Subsequently, (3) higher motivation would lead to higher math scores in the 12th grade. We also predicted that (4) the moderating effect of peer interethnic relations perceptions would hold true at both the individual and the school level. Regarding differences between Asian and Latino students, our hypotheses remained exploratory, as prior research data on such differences is mixed.

In testing the above hypotheses, the present study sought to enrich the existing literature by expanding upon previous similar research on three accounts. First, we chose to measure perceived peer interethnic relations at both the individual and the school level. This distinction has potential policy implications. For instance, interethnic relations as collectively perceived may be more concretely tackled with policies than *individual* discrimination experiences or perceptions of conflict that might benefit from individual-level intervention. Secondly, we employed a moderated-mediation model on a large national sample to acquire a more detailed picture of common obstacles facing immigrant youth on their path to academic success. Thirdly, the separate and comparative testing of our hypothesized model with Asian and Latino students allows for examination of the generalizability of model relations. In this manner, the present study should help facilitate the move beyond surface-level differences between ethnic groups by comparing the psychosocial processes underlying their achievement.

Method

Public use data from the Educational Longitudinal Study of 2002 (U.S. Department of Education, 2004) were utilized. The Educational Longitudinal Study of 2002 (ELS) assessed 17,591 randomly selected students, 743 school administrators, 718 librarians, and 13,488 parents associated with one of 752 schools (Ingels, Burns, Chen, Cataldi, & Charleston, 2005). The public use data set used for the present study included assessments during the students' sophomore (spring, 2002) and senior years (spring, 2004) of high school. The overarching purpose of the ELS, conducted by the U. S. Department of Education Institute of Educational Sciences, was to monitor the transition of a nationally representative sample of youth as they progressed from tenth grade through high school and beyond. The ELS followed ethical standards for human subject research (Ingels et al., 2005).

Participants

Of the 17,591 students from 752 schools, this study assessed 1,121 Latino and 992 Asian students from 461 schools who reported being non-native English speakers. Two hundred and eighty-nine schools (39%) were removed because they did not include both Asian and Latino non-native English speakers. The non-native English speakers included in this sample were required to have received academic instruction primarily in English for at least 3 years or, based on their schools' judgment, deemed able to provide meaningful responses to the English language survey. Students who were unable to complete the survey due to very limited English proficiency or a disability represented only a small percentage of the overall survey respondents (1%). The final sample was 52% female, averaging 16 years of

age ($SD = 0.7$) at baseline (sophomore year). Approximately 50% were born outside of the United States (91% of the students' mothers and 92% of the students' fathers were born outside of the United States).

Measures

English proficiency—Students' English proficiency score was based on their responses to four items from the sophomore year survey. Participants were asked: *How well do you do the following? ...understand spoken English, ...speak English, ...read English, and ...write English*. Each of these questions required a response of either *very well* (4), *well* (3), *not well* (2), or *not at all* (1). These items were then averaged to form a single score, which was subsequently grand mean-centered ($\alpha = .94$ and $.92$ for Latino and Asian students, respectively).

Peer Interethnic Relations index—This index was based on two questions from the student sophomore year survey: *Students make friends with students of other racial and ethnic groups* (reverse-scored) and *fights often occur between different racial/ethnic groups* ($r = .09$ and $.19$ for Latino and Asian students, respectively). Response options ranged from *strongly agree* (1) to *strongly disagree* (4). These items were averaged, followed by grand-mean centering, with higher scores indicating more positive interethnic relations. Peer interethnic relations were also measured at the school level by aggregating (averaging) student interethnic relations scores within each school (range: $-1.97 - 1.03$, $M = 0.05$, $SD = 0.45$).

Academic motivation—Academic motivation was computed based on responses to eight items administered during the sophomore year. We operationalized academic motivation as a composite of the importance a student placed on good grades and education (indicating the subjective value of academic achievement), and the amount of academic effort he/she exerted (reflecting achievement-related choices). Achievement-related choices were reflected in six items (e.g., *When studying, I try to work as hard as possible* and *I study to increase my job opportunities*; $\alpha = .91$ and $.88$ for Latino and Asian students, respectively) measured on a 4-point response scale (1 = *Almost never* to 4 = *Almost always*). The subjective value of academic achievement was measured using two items: *How important are each of the following to you in your life... Getting a good education* (1 = *Not important* to 3 = *Very important*) and *How important are good grades to you?* (1 = *Not important* to 4 = *Very important*), $r = .51$ and $.53$ for Latino and Asian students, respectively. The two subscales were computed as an average of their respective items, were standardized, and were then averaged to compute the motivation variable used in the analysis.

Math achievement—Student math achievement was assessed using the IRT-estimated scores during the sophomore and senior years. The math achievement scores included in the ELS dataset are based on items previously used in other national studies (e.g. the National Educational Longitudinal Study, National Assessment of Educational Progress, and Program for International Student Assessment; Burns et al., 2003). The Item Response Theory (IRT) mathematics score represents the sum of the probabilities that a student would have correctly answered each item in the 85-item battery of mathematics questions had they taken the entire test in each of the two observational periods. IRT probability estimates are adjusted for item difficulty, discrimination, and the possibility of a student answering correctly because of guessing. Questions covered math content areas of arithmetic, algebra, geometry, data/probability, and advanced topics. All items were field tested the previous year and evaluated using classical item analysis and item response theory (IRT) to examine each item's ability to discriminate mathematics proficiency, invariance across respondent

subgroups (e.g. male and female), and reliability and were found to possess excellent psychometric properties (Burns et al., 2003; Ingels et al., 2005).

Covariates—Participants' socioeconomic status and gender at the student level and the school population size, and percent receiving free lunch, were included as covariates in all analyses. Socioeconomic status (SES) at the individual level was measured by a composite variable using five equally weighted, standardized components: father's/guardian's education, mother's/guardian's education, family income, father's/guardian's occupation, and mother's/guardian's occupation (range: -0.99 – 1.80, $M = -0.03$, $SD = 0.68$). School-level covariates included school size (range: 1 – 9, $M = 5.50$, $SD = 2.52$), and the percentage of students receiving free lunch (ordered categories, 1-7; 27% of schools reported 0-5% of students receiving free lunch and 7% reported more than 75% of students receiving free lunch). These covariates were included because prior research has suggested that these factors contribute to the academic success of high school students (Hoffer, 1997; Lee, 2000; Lee & Burkam, 2003; Weiss, Carolan, & Baker-Smith, 2010). Descriptive statistics for all predictor and outcome variables by Asian and Latino subgroups are provided in Table 1.

Results

Overview of Data Analysis

Multilevel moderated-mediation analysis was conducted using Mplus statistical software (v. 6.1, Muthen & Muthen, 2011). At the student level, perceptions of peer interethnic relations and English proficiency were specified as having direct and indirect effects on sophomore- and senior-year math achievement scores through sophomore report of academic motivation, controlling for gender and SES (see Figure 1). In order to test the potential for an interaction of interethnic relations perceptions and English proficiency at the student level, an interaction term was created by first grand-mean centering the variables and then multiplying them. SES was also grand-mean centered prior to analysis. Intercepts for the endogenous variables were allowed to randomly vary across schools (i.e., random effects of school). At the school level, the random intercepts were regressed on peer interethnic relations means, controlling for percent of student body receiving free lunch and school size. Furthermore, the potential for a cross-level interaction was estimated by allowing the slope between English proficiency and academic motivation to vary between schools and by regressing the random slope on school-level interethnic relations means.

Prior to estimation, single-imputation of missing data for the student-level exogenous variables using the EM algorithm was employed. A full information, robust maximum likelihood estimator (*mlr*) was employed to obtain parameter estimates and standard errors that account for the nested data structure and are robust to non-normality and missing data under the assumption that missingness among the endogenous variables is random conditional on the covariates (approx. 40% and 21% were missing data on the motivation and senior math variables, respectively). Furthermore, a numerical integration algorithm was necessary to obtain maximum likelihood estimates given the incorporation of random slopes. Subsequently, since summary statistics are not sufficient statistics, model fit tests and indices are not available.

Parameters of the hypothesized model were estimated simultaneously for Latino and Asian students. The tenability of equality constraints on all student-level path coefficients and random intercept means was tested using a series of single *df* likelihood ratio tests, adjusted for the scale correction factor (Satorra, 2000). A significant likelihood ratio test supports the conclusion that a path coefficient differs between Asian and Latino students (i.e., ethnicity moderates the path). The final estimated model incorporated the equality constraints that were not rejected by the likelihood ratio tests.

Mplus does not allow options to obtain empirical bootstrap or Sobel-based tests of indirect effects when the numerical integration algorithm is used. Instead, we used the joint test of significance approach, which evaluates the joint statistical significance of all direct paths along a particular indirect path, to assess the statistical significance of the hypothesized mediated effects (see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Student-Level Effects

For Latino students, being female, coming from a higher SES family, and being more proficient in English were significantly associated with greater academic motivation (see Table 2). However, the effect of English proficiency on motivation was moderated by individual perceptions of positive interethnic relations. English proficiency was significantly associated with greater academic motivation at average ($\gamma = 0.19$, $SE = 0.049$) and high (1 *sd* above the mean; $\gamma = 0.31$, $SE = 0.086$) levels of positive interethnic relations perceptions, but not at low (1 *sd* below the mean; $\gamma = 0.061$, $SE = 0.070$) levels of positive interethnic relations perceptions (see Figure 2). Greater academic motivation, in turn, was associated with higher sophomore math scores and higher senior math scores, controlling for sophomore math scores. Being male, coming from a higher SES family, being more proficient in English were also directly associated with better math scores in their sophomore year.

For Asian students, only coming from a higher SES family and reporting better English proficiency was associated with higher academic motivation in students' sophomore year. In contrast to the Latino students ($\Delta\chi^2(1) = 5.69$, $p = .017$), Asian student perceptions of peer interethnic relations did not significantly moderate the association between English proficiency and academic motivation, nor did English proficiency exhibit a direct effect on their sophomore math achievement scores ($\Delta\chi^2(1) = 22.38$, $p < .001$). Students reporting higher academic motivation obtained better math achievement scores in their sophomore and senior years. All effects that were mutually significant for Asian and Latino students were statistically equal between the groups, as were most mutually non-significant effects. Where patterns of significance differed between Asian and Latino students, the path coefficients were significantly different.

In summary, greater English proficiency during their sophomore year was indirectly associated with higher senior math achievement scores through higher academic motivation for both Asian and Latino students; however, among Latino students, this indirect path was only significant for Latinos whose perceptions of positive peer interethnic relations at school were average or above average. Latino students with below average perceptions of peer interethnic relations did not evidence an indirect effect of English proficiency on senior math achievement scores through academic motivation. Other than this difference between Asian and Latino students, results were generally identical for students in both groups.

School-Level Effects

We had also suggested that school-level peer interethnic relations (i.e., school level aggregate of individual relations perceptions) might moderate the association between English proficiency and academic motivation or effect school-level means on motivation and math achievement scores. However, results did not lend support to these expectations as the cross-level interaction and school-level effects of peer interethnic relations means were all not significant. Schools with a greater percentage of students receiving free lunch had lower average sophomore and senior math achievement scores. Larger schools exhibited higher mean sophomore math scores.

Discussion

At the individual level, nearly all of our hypotheses were supported: (1) higher English proficiency was related to increased academic motivation among Asian and Latino students, and (2) when Latino students perceived their school as containing a low amount of positive peer interethnic relations, the association between English proficiency and motivation became non-significant, while perceptions of positive interethnic relations strengthened the association. This moderating effect of peer interethnic relations, however, did not hold true for Asian students. (3) Higher motivation was also related to higher math scores both in students' sophomore and senior years.

Regarding the influence of peer interethnic relations at the school level, our hypothesis (4) was not supported: the interaction between individual students' English proficiency and school-level interethnic relations influencing aggregate student motivation was not statistically significant. Only two covariates, the school's size and its socioeconomic status, predicted student math achievement at the school level. The importance of individual perceptions and non-significance of collective school-level perceptions may in part be explained by literature on ethnicity and aggression. Hernandez-Sheets (1996) and Duncan (1976) have suggested that individual perceptions of interpersonal conflict and violence can vary by ethnicity of the perpetrator of aggressive behavior; for example, the same kind of shove exerted by a white and a black person may be perceived as non-violent in the former case but violent in the latter. In the present study, it is possible that whomever individual Latinos and Asians perceive as the perpetrator of interethnic fighting affects the extent to which they acknowledge its presence, which could make a school-level perception of the quality of peer interethnic relations inconsistent.

Asian vs. Latino Youth: Similarities, Differences, and Implications

Among both Asians and Latinos, English proficiency was a significant predictor of motivation and subsequent math achievement. These findings suggest that increasing the English proficiency of U.S. immigrant youth, both of Asian and Latino descent, remains important to supporting their motivation and academic success. Differences in math achievement between Latino and Asian youth may not be due to differential effects of English proficiency, as limited English proficient adolescents from both groups seem to be less motivated. However, differences between Asian and Latinos may exist in their perceptions of peer interethnic relations and the impact of these perceptions.

The single group difference identified was in the interaction between peer interethnic relations and English proficiency, significant only among Latino youth, but not among Asians. Some potential explanations of this difference might be drawn from previous research on factors driving the motivation of Asians as well as their receptive immigration context and, on average, higher-SES background. When compared to European Americans, Asian parents seem to emphasize persistence and effort as a means to success, and this attitude can function as a coping mechanism in reaction to discrimination (Kim & Chun, 1994). Moreover, many Asian families in the United States, particularly Korean and Chinese immigrants of recent decades, are part of reasonably well-off communities with higher social capital and more welcoming social and economic contexts of reception than most Latino immigrant groups (Portes & MacLeod, 1999; Portes & Rumbaut, 2001). Such resources may function as protective factors for many Asian youth, helping them to buffer the risks that negative peer interethnic relations pose to motivation and achievement outcomes.

For Latino students, on the other hand, it appears that perceived positive relations between different ethnic groups lead to stronger positive effects of English proficiency on motivation.

This process may occur because good peer interethnic relations within their schools make Latinos feel that their language tools for success will not be held back by institutional racism in the future, allowing them to have high aspirations and remain motivated. Further research is needed for a fuller understanding of how interethnic conflict may function to motivate and de-motivate Latino youth and of what factors moderates such effects among Asian youth.

Limitations

Though based on longitudinal data, the present study's analyses are limited by being correlational (non-experimental), preventing us from making strong causal inferences. Another limitation is the simplified index of peer interethnic relations available from the Educational Longitudinal Study 2002 data set. Rather than assessing school racial climate more broadly, including policy aspects and perceptions of student-teacher interactions, for example, the measurement used was based only on the amount of friendships and violence that students perceived between ethnic groups at their school. Although previous research supports these as being important indicators (Benner & Graham, 2011; Hune & Takeuchi, 2008; Suarez-Orozco et al., 2009), future studies would benefit from using a more comprehensive measure including the many facets of interethnic relations and racial climate that exist, especially for assessments at the school level.

Moreover, the cultural and socioeconomic heterogeneity of Asians and Latinos was not accounted for in the application of the proposed model to the two ethnic groups. Refraining from further differentiation within these two groups allowed for adequate sample sizes for comparative analyses and an increased ability to detect extant effects. However, the findings for each group should be taken as a general direction for more nuanced research on the impacts of peer interethnic relations and English proficiency within these diverse pan-ethnic groups. Potential differences based on nationality, reason for immigration, and immigrant generation, for example, were not measured in the present study.

Finally, the exclusive use and availability of quantitative data prevented the present study from delving more deeply into the students' perceptions of interethnic relations. The present findings, however, open doors for new qualitative research on the identified relationships.

Recommendations for Future Research and Policy

The present findings suggest that English proficiency is an important driver of motivation for immigrant youth generally but that, for Latinos, the usefulness of this motivator is contingent upon positive perceived interethnic relations among peers. These perceived relations seem to be less determinant of Asian students' academic motivation. In order to better understand this difference, future research should examine whether social capital and parental standards may buffer any impacts of negative interethnic relations. Future research should also differentiate between specific Asian and Latino subgroups, as their socioeconomic status and community resources are all but homogenous. It is furthermore crucial to consider differences between Asians and Latinos in future studies of motivation and achievement among immigrant youth at large. It would be useful to employ mixed methods in such studies. Specifically, qualitative data can be conducive to an understanding of *how* statistically significant variable interactions occur.

The results of this study support a few key recommendations for social and educational policy and practice. While the impact of school policies against discrimination should be the subject of further, more nuanced investigation, the importance of student perceptions of peer interethnic relations in their schools should be taken to account in ESL programs and in the general instruction of culturally diverse student groups, especially those with a high percentage of Latinos. School policies against discrimination should also be seen by students

to be in action and effective. Ways in which students' subjective experience of interethnic relations may be improved include diversity/intercultural competency workshops for students and families as well as teacher training sessions for diversity management in the classroom. The latter are of particular importance, since teachers directly influence students and peer dynamics on a daily basis.

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Figure 1.
Hypothesized Multilevel Path Model. S1 represents the random slope of academic motivation on English proficiency.

Figure 2.
Simple Slopes of Academic Motivation on English Proficiency at Levels of Perceived Interethnic Relations for Latino Students ($N = 1121$)

Table 1

Descriptive statistics of variables by Asian (n=992) and Latino (n=1121) subgroup

	1	2	3	4	5	6	7
<i>Student level Predictors</i>							
1. Motivation	-	.08	.17	-.03	.15	.19	.16
2. Interethnic Relations	.05	-	.13	.15	.15	.11	.06
3. English Proficiency	.11	.12	-	-.14	.12	.10	.22
4. Proficiency $\times$ Relations	.08	.07	-.19	-	.01	-.01	-.06
5. Math Sophomore	.22	.15	.28	.02	-	.88	.28
6. Math Senior	.23	.17	.27	.01	.88	-	.28
7. Socioeconomic Status	.12	.05	.19	-.02	.18	.17	-
<i>M_{Asian}</i>	0.20	-0.02	-0.01	0.06	47.29	53.88	0.09
<i>SD_{Asian}</i>	0.77	0.60	0.59	0.34	15.24	16.41	0.59
<i>ICC_{Asian}</i>	0.04	0.09	0.08	0.04	0.29	0.30	0.29
<i>M_{Latino}</i>	0.05	0.01	-0.02	0.05	34.33	38.74	-0.16
<i>SD_{Latino}</i>	0.85	0.58	0.59	0.33	12.53	13.64	0.66
<i>ICC_{Latino}</i>	0.10	0.20	0.07	0.06	0.21	0.18	0.14

Note. Correlation matrix above the diagonal is for the Asian subgroup; correlation matrix below the diagonal is for the Latino subgroup.

Fixed Effects Between Student and School level Predictors

Table 2

	Motivation			Math Sophomore			Math Senior		
	<i>b</i>	<i>SE</i>	<i>CI</i> _{95%}	<i>b</i>	<i>SE</i>	<i>CI</i> _{95%}	<i>b</i>	<i>SE</i>	<i>CI</i> _{95%}
Student Level Effects									
Latino Students									
Female	0.33	0.07	0.19 - 0.46	-1.56^e	0.56	-2.65- 0.47	-0.07 ^e	0.35	-0.74- 0.62
Socioeconomic Status	0.12^e	0.03	0.05 - 0.19	1.28^e	0.50	-0.01 -2.56	0.16 ^e	0.29	-0.41- 0.73
English Proficiency	0.19^e	0.05	0.19 -0.28	4.24	0.54	3.18 - 5.29	0.11 ^e	0.33	3.18-5.29
Perceived Interethnic Relations	0.04 ^e	0.05	-0.05 - 0.12	1.83^e	0.58	0.68 - 2.98	0.67	0.40	-0.12 -2.98
Proficiency × Relations	0.21	0.10	0.01 - 0.41	1.38 ^e	0.76	-0.09 -2.85	-0.58 ^e	0.54	-1.63- 0.48
Motivation	---	---	---	2.35^e	0.50	1.39 - 3.32	0.92^e	0.38	0.17 - 1.68
Math Sophomore	---	---	---	---	---	---	0.93^e	0.02	0.90 - 0.96
Asian Students									
Female	0.09	0.06	-0.04 - 0.21	-1.56^e	0.56	-2.65- -0.47	-0.07 ^e	0.35	-0.74 -0.62
Socioeconomic Status	0.12^e	0.03	0.05 - 0.19	1.28^e	0.50	2.14 - 5.08	0.16 ^e	0.29	-0.41 -0.73
English Proficiency	0.19^e	0.05	0.19 -0.28	0.66	0.71	-0.74 -2.05	0.11 ^e	0.33	-0.54 -0.75
Perceived Interethnic Relations	0.04 ^e	0.05	-0.05 - 0.12	1.83^e	0.58	0.68 - 2.98	-0.76	0.46	-1.66 -0.15
Proficiency × Relations	-0.05	0.10	-0.25 - 0.15	1.38 ^e	0.76	-0.09- 2.85	-0.58 ^e	0.54	-1.63 - 0.48
Motivation	---	---	---	2.35^e	0.50	1.39 - 3.32	0.92^e	0.38	0.17 - 1.68
Math Sophomore	---	---	---	---	---	---	0.93^e	0.02	0.90 - 0.96
School Level Effects									
% Students on Free Lunch Plan	-0.01	0.08	-0.03 - 0.01	-1.10	0.22	-1.53--0.66	-0.29	0.11	-0.05--0.07
School Size (# of students)	-0.00	0.01	-0.02 - 0.02	0.42	0.15	0.12 - 0.72	0.07	0.08	-0.10-0.24
Interethnic Relations	0.01	0.08	-0.14 - 0.16	1.97	1.20	-0.39 -4.32	0.45	0.70	-0.92 -1.82
Cross Level Interactions									
Proficiency × Relations	0.16	0.14	-0.13 - 0.44	---	---	---	---	---	---

Note. Statistically significant effects at $p < .05$ are depicted in bold typeface. All school level effects were constrained across groups.

^e Coefficients between the groups were found to be equivalent and therefore constrained across groups.