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School Belonging, Generational Status, and Socioeconomic Effects on Mexican-Origin Children’s Later Academic Competence and Expectations

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Abstract

This study examined factors that relate to academic competence and expectations from elementary to middle school for 674 fifth grade students (50% boys; $M_{age} = 10.86$ years) of Mexican origin. Models predicting academic competence and expectations were estimated using a Structural Equation Modeling (SEM) framework, with longitudinal data from fifth to eighth grades. School belonging (i.e., social and emotional connectedness to school) predicted greater academic competence and expectations over time. Findings indicate that student feelings of belonging in school may act as a resource that promotes academic competence and expectations. Furthermore, family income, parent education, and generational status had direct effects on academic competence and expectations to some degree, suggesting the importance of contextual factors in this process.

Keywords

school belonging; academic competence; academic expectations; Mexican-origin youth; generational status

Previous research suggests that youth’s feelings of belonging in school may promote their academic competence (i.e., grade point average, GPA, and how well the student does coursework compared to peers) and expectations (i.e., aspirations and expectations for future academic attainment). An individual’s perceived sense of school belonging reflects the student’s psychological experience in school and the significance placed on schoolwork. School belonging includes feeling connected to school and teachers (Gillen-O’Neel & Fuligni, 2013), as well as identifying with conventional goals such as doing well in school (Voelkl, 2012). In this study, we draw on the belongingness hypothesis which proposes that having a sense of belonging and forming an attachment to others is a basic necessity – one that precedes goal achievement and motivates behavior to achieve goals (Baumeister & Leary, 1995). Having a sense of belonging in school, in particular, is thought to motivate

academic achievement (Juvonen, 2006). According to the belongingness hypothesis, students who have a strong sense of belonging to school – a social and emotional connection to school and to the people in school – become more invested in succeeding in school. In contrast, students who do not feel they belong will show poorer academic outcomes.

Despite promising findings related to the association between school belonging and academic competence and expectations (Gillen-O'Neel & Fuligni, 2013; Goodenow & Grady, 1993; Ibañez, Kuperminc, Jurkovic, & Perilla, 2004; Kuperminc, Darnell, & Alvarez-Jimenez, 2008; LeCroy & Krysik, 2008), research in this area has been hampered by significant limitations, including excessive reliance on cross-sectional research designs, insufficient attention to ethnic minority youth, and failure to consider broader contextual factors likely to influence experiences and achievement in school. Overreliance on cross sectional studies calls into question the usual assumption that school belonging affects academic outcomes as the reverse may be true (Juvonen, 2006). In addition, without research focused on different ethnic groups, we cannot be certain in which populations the belongingness hypothesis may or may not operate. Finally, associations between school belonging and academic outcomes may be fully explained or significantly influenced by broader contextual factors that have not been adequately incorporated in previous research. The present study was designed to address these limitations in previous investigations in order to shed new light on the role of school belonging in the academic lives of minority youth.

The present study uses data from a longitudinal study of Mexican-origin youth, who were followed annually from fifth to eighth grade. Individuals of Mexican origin make up about 65% of Latinos in the U.S. and Latinos represent a rapidly growing segment of the U.S. population ("Profile America," 2013). By the year 2060 about 31% of the U.S. population will be of Latino origin ("Profile America," 2013). In addition to their growing number, students of Mexican origin have lower academic attainment compared to other ethnic groups in the U.S. (Yosso & Solórzano, 2006). This trend contradicts the high expectations Mexican parents have for their children's education (Azmitia, Cooper, & Brown, 2009). Furthermore, poor academic performance limits prospects for future employment and educational attainment (Hao & Woo, 2012). Thus, continued examination and understanding of processes that contribute to the academic success and failure of Mexican origin students may help in designing policies and programs that will foster positive changes in academic achievement of this population. This study extends prior research by examining prospective reciprocal relations between school belonging and academic competence and expectations, and by examining the influence of three contextual factors (child generational status, family income, parent education), as illustrated by the conceptual model in Figure 1. We now review research on the associations between school belonging, academic competence, and academic expectations.

School Belonging, Academic Competence, and Academic Expectations

The construct of school belonging encompasses students' feelings of closeness to their teachers, their emotional attachment to their school, and their commitment to conventional school goals. For ethnic minority students in particular, who may face unique circumstances

such as acculturation stressors, the degree to which school belonging relates to academic achievement in the transition to adolescence is of theoretical and practical importance. The belongingness hypothesis (Baumeister & Leary, 1995) and research on social bonds (Juvonen, 2006) suggest that forming attachments to others motivates behavior to achieve academic goals. The construct of school belonging may be an especially important predictor of academic achievement for Mexican origin children given the value of familism and reciprocated relationships among Mexican origin families (Taylor, Larsen-Rife, Conger, & Widaman, 2012). In an ethnographic investigation, for example, Mexican origin high school students described the importance of feeling cared for by teachers before showing interest in school (Valenzuela, 1999).

School Belonging and Academic Competence

Earlier research demonstrates a positive association between school belonging and academic competence, supporting Path C in our conceptual model (Figure 1). For instance, in a cross-sectional study of primarily Mexican origin youth, Kuperminc et al. (2008) observed that, among middle and high school Latino youth (79% immigrant; 61% of all participants born in Mexico), school belonging was positively linked to academic competence and grades. Among students in a southwestern U.S. middle school, higher levels of school belonging were concurrently associated with higher GPAs (73% of participants Hispanic, mostly Mexican; LeCroy & Krysik, 2008). However, using longitudinal data, Gillen-O'Neel and Fuligni (2013) failed to find an association between school belonging and *later* GPA among high school students (30% of whom were of Mexican origin), raising questions about whether school belonging has a prospective effect on academic achievement.

School Belonging and Academic Expectations

Research also has shown a positive association between school belonging and academic expectations (Path C, Figure 1). In a cross-sectional study of seventh to ninth grade youth of various ethnic backgrounds (16% Latino; Goodenow & Grady, 1993), school belonging was concurrently associated with greater expectation of academic success and greater interest in schoolwork and achievement, both closely related to future academic expectations. In another cross-sectional study, Ibañez et al. (2004) found that among Latino high school youth in Georgia (74% immigrant youth; 50% of all participants born in Mexico), school belonging was associated with higher school aspirations. In a longitudinal study of high school youth from various backgrounds, Gillen-O'Neel and Fuligni (2013) found that school belonging was positively associated with the perceived value of school for attaining future goals, a concept tied to academic expectations.

School Belonging Summary and Longitudinal Trajectories

Together, these results support the hypothesized positive association between school belonging and academic competence and expectations (Path C). As previously mentioned, a major limitation of these earlier, cross-sectional studies is that they are unable to examine the temporal order between the variables of interest (see Gillen-O'Neel & Fuligni, 2013 for an exception). As shown in Figure 1, however, it is also possible that academic achievement and school belonging are part of a reciprocal or transactional process (Juvonen, 2006). Doing well in school comes with public praise of achievements, possibly strengthening a

student's sense of school belonging (Anderman, 2003), supporting Path D in Figure 1. However, it may be that school belonging does not predict changes in academic competence (Gillen-O'Neel & Fuligni, 2013) and expectations, or vice versa. Due to the shortage of longitudinal studies, current research has not adequately addressed these alternative possibilities. In the present study, we ask: to what extent does school belonging relate to later academic competence and expectations, and conversely, do academic competence and expectations lead to increases in school belonging?

In addition, we explore the longitudinal trends in school belonging, academic competence, and expectations. The transition from childhood to adolescence is a critical developmental period during which declines in achievement are often observed among youth from various ethnic backgrounds (e.g., Anderman, 2003; Espinoza & Juvonen, 2011), including Latino youth (e.g., Espinoza & Juvonen, 2011: 37% of participants were Latino; Gillen-O'Neel & Fuligni, 2013: 35% of participants were Latino). This decline may result from a more competitive middle school environment with more teacher separation than in elementary school. During this period in life most youth also experience potentially stressful cognitive, biological, and social changes which may hamper their performance in school (Eccles et al., 1993). Also important, Juvonen (2006) proposed that the influence of school belonging on academic competence starts in elementary school but these effects may become less important when students enter adolescence and concerns about peer acceptance become more salient. Because the present study spans the period from fifth to eighth grade, we can examine whether associations between school belonging and academic outcomes change as children move from elementary to middle school as suggested by Juvonen (2006).

Generational and Socioeconomic Predictors of Academic Competence and Expectations

Children of Mexican origin vary widely in terms of how long their families have lived in the U.S. (i.e., generational status) and their socioeconomic circumstances (i.e., socioeconomic status, SES). Indeed, earlier research on school belonging has not adequately addressed the possibility that variations in these background factors may affect school belonging, academic competence, and academic expectations in a way that reduces the associations among them.

Child Generational Status

In the U.S., approximately 33% of Mexican origin 16- to 25-year-olds are first generation (born in Mexico), 36% are second generation (born in the U.S., at least one parent born in Mexico), and 31% are third generation or higher (youth and both parents born in the U.S.; *Between two worlds: How young Latinos come of age in America*, 2009). The importance of generational status is underscored by the "immigrant paradox," a term first coined from findings suggesting that first generation immigrants engage in less risky behavior compared to their second and later generation counterparts (García Coll & Marks, 2011). We expect that if first generation youth engage in fewer problematic and risky behaviors, they also may demonstrate higher levels of school belonging, academic competence, and academic expectations and thus help to account for the associations among them (Paths A and B).

There is some evidence, for example, that Mexican origin children with immigrant parents have higher GPA's than their peers with parents who were born in the U.S. (Hurtado-Ortiz & Gauvain, 2007) and this finding also holds for other foreign-born Latino youth (Fuligni, 1997; Pong & Zeiser, 2011). Similarly, earlier generational status (i.e., foreign-born adolescents living in the U.S. from a young age) positively predicted concurrent levels of school achievement (i.e., classes passed), as well as positive changes in achievement levels among a nationally representative study of adolescents (Hao & Woo, 2012). Regarding academic expectations, first and second generation Hispanic youth had higher educational aspirations compared to third and later generation youth (Kao & Tienda, 1995). Together, these findings support the idea that those in earlier generations are likely to be more committed to school and have higher grades, perhaps in accordance with the concept of immigrant optimism which involves the expectation of immigrant parents that they and their children will have better educational and economic opportunities in the U.S. (Kao & Tienda, 1995). First generation children may also place a higher value on school success in a manner consistent with their immigrant parents' expectations (Fuligni, 1997).

However, some studies show no effect of generational status on academic performance among Mexican origin youth (Roosa et al., 2012) and Latino immigrant youth (DeGarmo & Martinez, 2006; Kao & Tienda, 1995). Additionally, some studies have demonstrated a generational advantage. For example, some studies found that math grades and scores were higher for later generation Latino youth (Fuligni, 1997; Pong & Zeiser, 2011), and academic competence was higher for Latino adolescents born in the U.S. compared to those born outside the U.S. (Ibañez et al., 2004). Regarding expectations, aspirations for educational attainment were higher for U.S. born Latino adolescents (Ibañez et al., 2004) and later generation high school students of Mexican origin (Ojeda & Flores, 2008) and other ethnic backgrounds (23% Latino; Fuligni, 1997). The inconsistency in findings across studies underscores the need for further research on this issue.

Regarding school belonging, few studies have actually examined possible generational influences on children's sense of belonging in school (Path A). In one study, however, first generation adolescents reported having the most positive attitudes toward school (i.e., liking school) compared to second generation students and followed by third generation students (Pong & Zeiser, 2011). In another study of Latino adolescents attending rural schools with predominately White students (in a community where most Latinos were of Mexican origin), Diaz (2005) found that Latinos born outside the U.S. had higher levels of levels of bonding to school compared to those born in the U.S. However, generational status was positively associated with school belonging among Latino adolescents with immigrant parents (74% immigrant youth; 50% of all participants born in Mexico; Ibañez et al., 2004). That is, children born in the U.S. demonstrated higher levels of belonging compared to those born outside the U.S. These studies show opposing results. The extent to which immigrant children and children of immigrants may show higher academic competence, expectations, and school belonging relative to children of native born parents could depend on the extent of barriers present for these individuals, including poverty, limited English proficiency, or mismatch between family and school communication. These factors could partially explain why previous research has failed to find an effect of generational status or support for a

generational advantage. Further examination can help clarify the associations between generational status and school belonging.

In summary, although some studies have found that earlier generational status is associated with higher academic achievement, a few have found no generational differences or a generational advantage, contrary to the immigrant paradox. However, given the weight of the evidence for the immigrant paradox across multiple domains of youth development (García Coll & Marks, 2011) and the relevance of academic outcomes to development, we proposed that first generation children, compared to later generation children, would demonstrate higher levels of academic competence and expectations (Path B). We also proposed that generational status would predict school belonging (Path A) based on preliminary evidence that first generation children have more positive attitudes toward school (Pong & Zeiser, 2011). Examining these associations across time extends prior research on the immigrant paradox as it relates to academic outcomes.

Socioeconomic Predictors: Family Income and Parent Education

In addition to generational status, we evaluate how family income and parent education level, both typical indicators of socioeconomic status, relate to school belonging, academic competence, and expectations. Because family income and parent education sometimes vary in terms of their association with children's developmental outcomes (Conger, Conger, & Martin, 2010), we consider them separately in later analyses. In terms of income, estimates show that 29% of Mexican origin families with children live in poverty in the U.S. (Aud, Fox, & KewalRamani, 2010). Moreover, parents in Mexican origin families have relatively low rates of education compared to other adults in the U.S. (Hispanics of Mexican origin in the United States, 2009).

Numerous studies have shown that SES is positively related to school success in the U.S. Gándara (2005), for instance, found that high-achieving Latino eighth graders were more likely to have parents with above-average incomes and education levels. In another study, parent education was positively related to GPA for Latino youth in immigrant families (Kao, 2004). Some studies have found that family income and parent education level are positively correlated with academic aspirations (Ibañez et al., 2004) and predict concurrent grades, changes in grades, and number of classes passed (Hao & Woo, 2012). Although these findings are consistent with research indicating a positive influence of SES on academic outcomes (Paths A and B), findings from other studies suggest that this effect may not be as strong for some immigrant or ethnic minority families (Fuligni, 1997; Ojeda & Flores, 2008).

With regard to school belonging, more affluent and more acculturated families and their children may feel more comfortable interacting with schools. Especially among immigrant students from low SES families, who may not be as familiar with the U.S. school system, there could be barriers to fostering a sense of school belonging. Although some studies have found a positive association between SES and school belonging (Wang & Eccles, 2012), other studies have failed to find this association within and across time (Ibañez et al., 2004; Wang & Eccles, 2012). Based on these past results, we propose that indicators of family SES

– specifically family income and parent education – will positively predict academic competence and expectations (Path B) as well as school belonging (Path A).

The Present Study

The present study tests the paths specified in the model in Figure 1. Because of its longitudinal design and attention to context, the present study is uniquely positioned to address limitations in earlier research by evaluating the directionality of the association between school belonging and academic competence and expectations. As indicators of academic competence and expectations, we follow the lead of earlier studies that have used a variety of measures to assess the constructs. Kuperminc et al. (2008), for example, analyzed perceived academic competence (i.e., student perceptions of general academic skills) and achievement (i.e., grades). Others include academic aspirations and expectations as measures of academic adjustment (Alfaro, Umaña-Taylor, & Bámaca, 2006; Ibañez et al., 2004). In this study, we examine academic achievement (i.e., grade point average or GPA), academic competence (i.e., how students compare academically with their peers), and academic expectations for the future (Hao & Woo, 2012).

Research Questions and Study Hypotheses

We examine school belonging and academic competence at four time points and academic expectations at three time points to address the temporal order of the associations between the study variables. That is, we ask whether earlier school belonging predicts later academic outcomes, whether earlier academic outcomes predict later belonging, or whether associations between them are reciprocal. Consistent with the belongingness hypothesis and the research findings just reviewed, we hypothesized that (1) school belonging will predict later academic outcomes above and beyond concurrent associations. Based on the earlier theory and empirical findings just reviewed, we expected that feelings of school belonging would predict rank-order increases in academic outcomes but that academic outcomes would not predict increases in school belonging. To our knowledge this is the first study to address these issues among Mexican origin youth, and one of the few to address these issues in any sample. We also evaluate the degree to which generational status, family income, and parent education relate to school belonging, academic competence, and academic expectations. We hypothesized that (2) generational status will negatively predict academic outcomes and school belonging, such that 2nd and later generation students will show lower levels of academic achievement, competence, and school belonging; (3) family income and parent education will positively predict academic outcomes and school belonging.

Finally, we will conduct exploratory analyses to examine the degree to which the associations between school belonging and the academic outcomes vary from year to year, as well as how much each of these variables changes over time. Analyses will include child gender and English language proficiency as covariates given evidence that girls outperform boys on some academic outcomes (Roeser, Eccles, & Sameroff, 1998) and that English language proficiency could be associated with academic achievement and generational status (Azmitia et al., 2009; Ojeda & Flores, 2008).

Method

Participants

Participants in this study included Mexican-origin families with a typically functioning child ($N = 674$, $M_{\text{age}} = 10.86$ years, 50% female) attending the fifth grade at Wave 1. The children were drawn at random from student rosters provided by two school districts, one in each of two cities in a metropolitan area of Northern California. The first school district, in a city with a population of approximately 470,000 (23% of Mexican origin; 2010 Census Summary File, 2010), served a higher percentage of low-income students (64–71% of students were eligible for free or reduced lunch) and more diverse ethnic demographic (32–36% Hispanic, 18–21% White, 18–21% Asian, 18–21% African American, 5–9% other; DataQuest, 2013) during the four waves of assessment. The second school district, in a city with a population of approximately 55,000 (44% of Mexican origin; 2010 Census Summary File, 2010), served a percentage of low-income students similar to state levels (49–63% of students were eligible for free or reduced lunch) and less diverse ethnic demographic (57–63% Hispanic, 28–33% White, 5% Asian, 1% African American, 3–6% other; DataQuest, 2013).

Families of children from these school districts were recruited by telephone or, for cases without a listed phone number, by a recruiter who went to their home. Of eligible families, 72.5% agreed to participate in the study. All family members were of Mexican origin as determined by their ancestry and self-identification as being of Mexican heritage. Also, the focal child had to be living with his or her biological mother. The majority of children resided in two-parent families (82%) with an average of three children in the household.

In current analyses, we included data collected for the study's two participating cohorts during fifth (2006, 2007), sixth (2007, 2008), seventh (2008, 2009), and eighth grades (2009, 2010). The majority of participants (97%) transitioned into middle school in seventh grade. Of the 674 participants who began the study at the first wave, 84% participated in the second, 86% in the third, and 88% in the fourth wave. Attrition analyses showed that those who did not participate in the second, third, or fourth waves, compared to those who remained in the study at corresponding waves, were not significantly different on demographic (i.e., income, parent education, gender) and study variables ($p > .05$), after adjusting for multiple comparisons.

Procedure

Trained bilingual research staff (most of Mexican heritage) interviewed study participants in their homes using laptop computers. Interviewers received two weeks of training and supervision in the field by an interviewer coordinator. The data used in the present study come from computer-assisted interviews. Interviews were conducted in Spanish or English based on participant preference. During the first wave of data collection, 85% of youth participated in English and 15% participated in Spanish. Similar language choice rates followed at the second (89% English), third (91% English), and fourth waves (92% English) of data collection. Interviewers had access to both English and Spanish questions so if the participant needed translation, either language could be referenced.

Measures

Native Spanish speakers from the project research staff translated the English measures to Spanish. Measures were translated from English to Spanish and then an independent group of bilingual staff members back translated the measures from Spanish to English to assure that the original meaning of each item was maintained.

Academic competence—Two measures of academic competence were included to estimate a single academic competence latent variable. Children rated their academic achievement on a 5-point scale (1 = *F* and 5 = *A*) and their academic competence on a 5-point scale (1 = *far behind and it will be hard to catch up*, 2 = *somewhat behind and can probably catch up*, 3 = *a little behind and can easily catch up*, 4 = *current with most classwork*, 5 = *ahead of most classmates in classwork*). Reliabilities for this composite measure were acceptable in all waves (α 's = .61 – .76). Each measure was used as a separate indicator for a latent factor of academic competence (standardized factor loadings ranged from .60 to .76) and assessed at all four waves.

Academic expectations—Two measures were included to estimate a single academic expectations latent variable. Children reported how far they would like to go in school and how far they expected to go in school on an 8-point scale (1 = *8th grade or less* and 8 = *Ph.D. or professional degree*). On average, students expected to attain a “4-year college degree.” Reliabilities for this composite measure were acceptable in all waves (α 's = .85 – .86). These items were used to identify a latent variable of academic expectations (standardized factor loadings ranged from .85 to .88) and were assessed in three of the four waves (sixth, seventh, and eighth grades).

School belonging—School belonging was measured with five items tapping students' perceptions of closeness to teachers, attachment to school, and commitment to conventional school goals (e.g., “You care about your teachers,” “You like to do well in school,” “You look forward to going to school,” “You like school a lot,” “You feel safe at your school”). These items were selected from the School Attachment Scale (see Gonzales et al., 2008) and additional items were added based on the School Bonds scale (Murray & Greenberg, 2000). The items from the School Attachment Scale (Gonzales et al., 2008) and the School Bonds Scale (Murray & Greenberg, 2000) were developed to assess general engagement in school. However, some of the items probed about academic expectations (e.g., It is important to finish high school) and were not conceptually distinct from the academic expectations outcome measure. Furthermore, we conducted a factor analysis of the remaining items and found that some items did not load onto the same factor. Thus, we omitted these items and use a 5-item construct labeled school belonging to assure that the items are conceptually different from the outcomes of interest and that they are a part of a cohesive factor. The items were rated from 1 (*not at all true*) to 4 (*very true*), with higher scores indicating a stronger sense of belonging in school. Reliabilities were acceptable in all years (α 's = .70–.78). These items were converted into three parcels by random assignment (Little, Cunningham, Shahar, & Widaman, 2002) to create indicators for the school belonging latent factor (standardized factor loadings ranged from .68 to .82).

Generational status—Mothers reported where they were born, where their child was born, and where the child’s father was born. First generation status was assigned to children born in Mexico (29% of participants). Second generation status was assigned to children born in the U.S., with at least one parent born in Mexico (62% of participants). Third generation status was assigned when the focal child and both parents were born in the U.S. (9% of participants). Codes were used to indicate generational status, with second generation being the reference point ($-1 = \textit{first generation}$; $0 = \textit{second generation}$; $1 = \textit{third generation}$).

Socioeconomic indicators—Mothers reported their family’s total income on a 20-point scale with \$5,000 increments ($M = \$30,000\text{--}35,000$, $SD = \$15,000\text{--}\$20,000$). Mothers reported their own and fathers’ educational level, in years of schooling ($M = 9.26$ years, $SD = 3.31$ years). Family income and parents’ average education level were used as separate observed socioeconomic indicators. Both variables were assessed at the first wave, in fifth grade.

Covariates—Child gender ($0 = \textit{girl}$, $1 = \textit{boy}$) and English language proficiency were included as covariates. To assess language proficiency (Hazuda, Stern, & Haffner, 1988), participants reported how well they read English on a scale from 1 (*not at all*) to 4 (*very well*).

Analysis Plan

All models were tested using SEMs estimated with *Mplus 6* (Muthén & Muthén, 1998–2010). To account for missing data, we used full information maximum likelihood estimation (FIML) to fit models directly to the raw data. FIML uses all available data, and only drops cases when information is missing on all data points; however, there were no cases with missing data on all the variables of interest in the study. Using FIML produces less biased and more reliable results compared with listwise or pairwise deletion to deal with missing data (Widaman, 2006). We used the likelihood ratio test (χ^2), the confirmatory fit index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993) to assess model fit. CFI and TLI values of .95 or greater and an RMSEA less than .06 indicate good fit of the model with the data.

We tested for measurement invariance across time for the latent constructs of academic competence, academic expectations, and school belonging. The residuals from each school belonging parcel were allowed to correlate across waves. Similarly, the residuals from each academic competence and expectations items were allowed to correlate across waves. Testing for measurement invariance evaluates whether the scale assesses the same construct at each wave (Widaman, Ferrer, & Conger, 2010). Configural invariance entails unconstrained factor estimates. We compare the change in fit from the configural to the weak invariance model, which entails invariant factor loadings across time. We next compare the weak to the strong invariance model, which entails invariant factor loadings and measurement intercepts. We compare the strong to the strict factorial invariance model, which entails invariant factor loadings, measurement intercepts, and unique variances. In

each step, a nonsignificant change in model fit suggests that the model with additional constraints fits the data as well as the model with fewer constraints. Strong invariance is preferred when establishing longitudinal measurement invariance (Widaman et al., 2010).

We found evidence for strong invariance for school belonging and strict invariance for academic competence and expectations. Practical fit indices were acceptable and reflected good fit to the data for the academic competence model (CFI = .98, TLI = .97, RMSEA = .03) and the academic expectations model (CFI = .98, TLI = .98, RMSEA = .04). These results suggest that the latent factors show at least strong measurement invariance over time.

In the final models, the observed direction and significance of the path coefficients between the variables were used to support or reject the hypothesized relationships among school belonging, academic competence, academic expectations, generational status, family income, and parent education. The cross-lagged longitudinal panel model allows us to examine the effect of a predictor variable on the subsequent outcome of interest, and vice versa, controlling for previous levels of the outcome. Positive and statistically significant coefficients between the variables will be interpreted as consistent with study hypotheses with two exceptions. We proposed that the cross-lagged coefficients from academic outcomes to school belonging would not be statistically significant. Thus, the absence of a significant coefficient for these paths would be consistent with our predictions. We also proposed that generational status would be negatively related to school belonging, academic competence, and expectations; thus, negative and statistically significant coefficients between the variables would be interpreted as consistent with study hypotheses. We conducted a multiple group analysis to test whether the proposed model operated differently for males and females (i.e., boys and girls; Widaman & Reise, 1997) but found no differences in the pattern of results. For that reason, all model tests were conducted with the combined sample of boys and girls. We also conducted multiple group analyses to test whether the models varied as a function of generational status but found no significant differences in the pattern of results and thus the analyses combine the generational groups. Model tests included gender and English language proficiency as covariates.

Results

Correlations and Descriptive Statistics

Table 1 provides the correlations, separated for boys and girls, among study variables used in the latent SEMs along with observed means and standard deviations. School belonging was positively correlated with academic competence ($r = .00-.55$) and expectations ($r = -.03-.42$) in most instances. Child generational status was significantly correlated with academic competence in seventh ($r = -.16$) and eighth grades ($r = -.17$) for boys. Family income was significantly correlated with academic competence ($r = .16-.27$) for girls and expectations ($r = .12-.17$) for boys and girls, but not significantly correlated with school belonging. Parent education showed some significant correlations with academic competence in fifth and sixth grades ($r = .12-.26$), as well as expectations in seventh and eighth grades ($r = .16-.21$ for boys). In addition, generational status was positively correlated with family income ($r = .23-.29$) and parent education ($r = .21-.33$), thus providing additional methodological justification for including all three variables in the analyses.

School Belonging and Academic Competence

Academic competence preliminary analyses—Each SEM tested the relationships shown in Figure 1. Because we had established at least strong measurement invariance across time, we tested whether the cross-lagged effects varied from year to year by constraining them to be equal over time. For academic competence, the model with constrained cross-lagged paths fit significantly worse than the unconstrained model, $\chi^2(8) = 26.29, p < .001$. Upon further examination, stability paths were constrained to be equal, except that the stability path for achievement from sixth to seventh grades was allowed to differ. Also, the path from school belonging in seventh grade to academic competence in eighth grade was allowed to vary. This model fit significantly better than the unconstrained model, $\chi^2(6) = 5.59, p = .47$, and was used to test the hypothesized effects. The final model included all study variables and demonstrated good fit (CFI = .97, TLI = .96, RMSEA = .03; see Table 2).

Academic competence model results—As shown in Table 2, school belonging ($\beta = .51-.52$) and academic competence ($\beta = .58-.73$) showed significant and strong stability across time. School belonging had significant cross-lagged effects on academic competence in sixth and seventh grade ($\beta = .07-.10$; see Table 2, column 1). We did not find differences in the magnitude of the relationship between school belonging and academic outcomes from fifth to sixth and from sixth to seventh grade. That is, school belonging predicted academic competence to the same degree (coefficients were estimated equally) in both grade transitions. However, school belonging in seventh grade did not predict academic competence in eighth grade, demonstrating that statistically, this path was different from earlier time points.

Also as expected, academic competence did not predict school belonging ($\beta = .01$; see Table 2, column 2). Thus, students who felt connected and committed to their school tended to show improvements in their competence (i.e., grades and perceived competence), whereas high levels of competence did not predict later feelings of school belonging.

As predicted, generational status had significant negative effects on academic competence ($\beta = -.07$; Table 2, column 2), indicating that earlier generation children showed higher competence levels in fifth through eighth grades, relative to later generation children. Family income had positive effects on competence in all years ($\beta = .07-.08$; Table 2, column 3), indicating that children from higher family income backgrounds showed increasing competence relative to children from lower family income backgrounds. Parent education level had significant positive effects on competence in fifth ($\beta = .11$) and sixth grades ($\beta = .10$; Table 2, column 4) but not in seventh and eighth grades. Generational status, family income, and parent education did not have significant effects on school belonging.

School Belonging and Academic Expectations

Academic expectations preliminary analyses—For academic expectations, the constrained cross-lagged model did not fit significantly worse than the unconstrained model, $\chi^2(3) = 6.12, p = .11$; thus, the constrained model was used to test the hypothesized effects. Only the academic expectations stability paths were allowed to vary. The final model

had good fit (CFI = .98, TLI = .97, RMSEA = .03; see Table 2). We also evaluated analyses for this model using one expectation item (i.e., how far participants expected to go in school) and results were the same. Thus, we present the findings from the academic expectations latent model.

Academic expectations model results—School belonging (β s = .54–.57) and academic expectations (β s = .26–.42) showed significant stability across time. As predicted, school belonging had significant cross-lagged effects on academic expectations in seventh and eighth grades (β s = .16–.19; see Table 2, column 5). We did not find differences in the magnitude of the relationship between school belonging and academic expectations across different grade levels. That is, school belonging predicted academic expectations to the same degree (coefficients were equivalent) in both grade transitions. Also as expected, academic expectations did not have cross-lagged effects on school belonging.

Generational status did not significantly predict academic expectations or school belonging (see Table 2, column 6). Family income (β = .09) and parent education (β = .06) significantly and positively predicted academic expectations, but not school belonging, in all years. Overall, the pattern of results is very similar to that found for academic competence. However, we did not find that generational status predicted expectations and found that parent education significantly predicted expectations in all years.

School Belonging, Academic Competence, and Academic Expectations Across Time

Significant mean differences for school belonging, academic competence, and academic expectations were present based on the measurement models for Models 1 and 2 (see Table 2). School belonging declined after sixth grade. School belonging levels in fifth and sixth grade were significantly higher compared to belonging levels in seventh and eighth grade ($p < .001$). School belonging was significantly higher in seventh compared to eighth grade ($p < .001$). Academic competence was significantly higher in fifth compared to seventh and eighth grades. Academic competence was lowest in eighth grade. Finally, academic expectations were significantly higher in seventh and eighth grade, compared to sixth grade ($p < .001$). In general, the study variables showed declines except for academic expectations, which showed increases.

Discussion

School Belonging, Academic Competence, and Academic Expectations

Previous research has emphasized the importance of school belonging for academic performance during childhood and adolescence but has largely lacked a longitudinal examination of such effects (e.g., Goodenow & Grady, 1993; Ibañez et al., 2004; Kuperminc et al., 2008). Drawing on the belongingness hypothesis (Baumeister & Leary, 1995), in this study we proposed that school belonging would positively predict later academic competence during the period from fifth to eighth grade and academic expectations from sixth to eighth grade. The results were consistent with the hypothesized relationships; higher levels of school belonging were associated with higher levels of academic competence (with one exception) and expectations from year to year. Only one out of six expected cross-

lagged paths was not significant – the path from school belonging in seventh grade to academic competence in eighth grade. It is possible that school belonging in elementary school (fifth and sixth grade) may have a more lasting impact on academic competence compared to school belonging in middle school (seventh and eighth grade), where classroom structure and peer dynamics change. In middle school, peer and academic pressures may create conflict and overshadow the positive prediction of school belonging. However, we note that school belonging did have a significant and positive association with academic expectations in the years examined from sixth to eighth grade. Thus, the findings indicated that school belonging consistently predicted student academic goals and expectations from sixth to eighth grades.

The study findings are, in part, a replication of previous cross-sectional studies (e.g., Goodenow & Grady, 1993; Kuperminc et al., 2008) and qualitative work on Mexican origin students (Valenzuela, 1999) that have examined similar variables and processes. Distinct from other studies, the present study was composed of all Mexican origin participants from a range of generational backgrounds, during a time frame that is typically marked by declines in academic achievement (Eccles et al., 1993). Thus, the present study extends earlier research by using a prospective longitudinal research design and by replicating the findings among Mexican origin youth. Evaluating models, such as the ones in this study, among youth of various ethnic backgrounds aids understanding of the generality of findings related to school belonging and the extent to which the belongingness hypothesis relates to academics. Future research is needed to determine whether these findings will replicate. Nonetheless, the study findings show that the potential of academic success among youth of Mexican origin might be fostered by policies directly addressing whether students feel welcomed in school.

Also important, in most cases we did not find differences in the magnitude of the relationship between school belonging and academic outcomes across different grade levels. The only exception we found was that school belonging did not predict academic competence from seventh to eighth grades. Juvonen (2006) proposed that school belonging may be more important at earlier school grades and less in later grades when peer approval may diverge from school-related achievement goals. We find some evidence for that hypothesis with academic competence. The majority of the participating children in the study made the transition to middle school after seventh grade. This transition may help explain why school belonging in seventh grade did not predict academic competence in eighth grade. Students going through this transition may be adapting to their new school environment and thus the impact or function of school belonging may change, as peers become an increasingly important influence on school norms and values. This possible peer effect, however, did not diminish the positive association between school belonging and academic expectations. Future research on the trajectories of academic expectations will help inform theories on related school and peer influences.

Longitudinal trajectories—In general school belonging and academic competence declined, replicating previous work (Anderman, 2003; Eccles et al., 1993; Espinoza & Juvonen, 2011). However, academic expectations for future academic attainment showed an increase following sixth grade. This suggests a gap or disconnect in the academic

competence of students, which declined, with their educational expectations, which increased. High expectations are a strength that could be further nurtured. School practitioners and families may take advantage of increasing academic expectations to help improve the academic competence of students and encourage academic success.

Generational Status, Family Income, and Parent Education

This study also examined hypothesized contributions of generational status, family income, and parent education to school belonging, academic competence, and academic expectations. The results were mostly consistent with the hypothesized relationships. Generational status, for example, was associated with lower academic competence. This finding is similar to other studies that have found that adolescent children of immigrant parents have higher GPA's and positive attitudes toward school than adolescent children of native-born parents (Fuligni, 1997; Hurtado-Ortiz & Gauvain, 2007; Pong & Zeiser, 2011). The finding in this study is interesting because the generational decline was only observed for academic competence but not for academic expectations. Studies examining generational status and academic expectations have found inconsistent results perhaps because of different age ranges or different times the studies were conducted. For example, the finding that earlier generations of Hispanics had higher college aspirations was based on the National Educational Longitudinal Study of 1988 (Kao & Tienda, 1995). Participants in studies that showed a later generation advantage in educational aspirations had different demographics, including Mexican American high school students living in a Texas-Mexico border town with a range from first to fifth generational status backgrounds (Ojeda & Flores, 2008), mostly immigrant (74%) high school Latino youth from Georgia in the late 1990's (Ibañez et al., 2004), and middle and high school immigrant youth of various backgrounds living in California (23% Latino; Fuligni, 1997). In the current study, most students had high goals for future educational attainment and these goals increased across time, regardless of their generational status. Perhaps contemporary widespread efforts to create a college-going culture (Corwin & Tierney, 2007) have encouraged the college aspirations of youth. However, some effects of family income and parent education on educational expectations suggest that college-going culture is still restricted by the socioeconomic circumstances youth face.

Generational status was significantly associated with family income and parent education. However, because we examined all three variables in the models, the effect of generational status was unique and not confounded by its association with socioeconomic status indicators. We found that generational status negatively predicted academic competence above and beyond the impact of family income and parent education and the other variables included in the study. Thus, the variation in family income and parent education does not explain the effect of generational status, suggesting that the experiences associated with generational status have implications for academic competence. These results provide further support for the immigrant paradox – that children of later generations show lower well-being – in terms of academic competence but not for academic expectations. Future research is needed to provide greater understanding of how specific experiences associated with generational status impact the developing child in school.

Family income consistently predicted academic competence and expectations for all years. Youth with higher family income had better academic competence and expectations. Parent education also predicted academic competence in fifth and sixth grades and expectations in all years. An interesting aspect to these findings involves the strength and consistency of results for family income compared to parent education. Many earlier studies have tended to show stronger developmental effects for parent education than for family income (see Conger & Donnellan, 2007). These results run contrary to that trend. It may be that the marginal financial status of many of these families placed them at special risk for adverse developmental consequences resulting from economic hardship. Even small departures from severe economic difficulties may improve the academic prospects of children. These findings may suggest that even small improvements in the financial status of Mexican origin families who are mostly from immigrant backgrounds (91% of youth were either first or second generation) may have significant benefits in terms of promoting positive academic outcomes.

Study Strengths, Limitations, and Future Directions

The longitudinal design of this study is a significant strength because it allows us to disentangle the temporal ordering of school belonging and academic outcomes. Examining the variable associations with cross-lagged model analyses advances the field because most studies examining school belonging have been cross-sectional (Kuperminc et al., 2008; LeCroy & Krysik, 2008). Furthermore, considering important background factors is also a strength that helps support the proposition that school belonging predicts later academic outcomes after taking generational status and family indicators of SES into account.

However, the current study was limited to self-report data on most study variables. Future research should use multiple reports of school belonging and academic outcomes. Replicating this study with multiple reports, such as teacher reports of academic competence, school reports of achievement, and peer reports of school belonging, will help advance this area of research. In addition, we note that the current study did not examine other support systems that may contribute to student academic success. Although we considered socioeconomic indicators of the families, neighborhoods and schools vary in resources available to students and their families (Biddle & Berliner, 2002). Teachers also vary in experience and professional expertise (McDonald Connor, Son, Hindman, & Morrison, 2005) in ways which may impact the degree to which students may feel welcome and supported in school.

Another limitation of this study is that the measure of academic expectations used may be limited in scope. The current study included two measures to assess academic expectations, asking youth to report how far they would like to go in school and how far they really thought they would go in school. Previous research has primarily used the second item to assess expectations (Updegraff, Umaña-Taylor, McHale, Wheeler, & Perez-Brena, 2012). We evaluated analyses for the expectation model only using the second expectation item, as previous research has done, and results were the same. Nonetheless, future assessments of academic expectations could be expanded to include other indicators such as how important it is for youth to go to college and how extensively they have thought of ways to achieve

their educational goals. Furthermore, we only evaluated academic expectation measures from sixth to eighth grades and recognize that future research could examine associations beyond middle school, similar to other research (Updegraff et al., 2012), when students take classes required for college entrance.

Although beyond the scope of this study, it is also important to identify factors that reduce and promote school belonging. For example, experiences of discrimination in school may inhibit developing a sense of belonging in school (DeGarmo & Martinez, 2006), particularly for Mexican origin youth. Future research should also examine the antecedents of school belonging and more specifically what methods effectively enhance school belonging among Mexican origin youth. Some research has begun to examine mechanisms or processes that contribute to the development of school belonging, including positive parenting practices (Taylor et al., 2012) and respectful classroom environments (Anderman, 2003). We expect that it would be worthwhile to evaluate how school practices promote school belonging among youth and specific efforts that school staff, families, and students could do to create a welcoming school environment. We also expect that practices such as promoting cultural understanding, including showing *cariño* or caring in the classroom and communities (Valenzuela, 1999), can help build school belonging among Mexican origin youth.

Future research should also continue to examine the degree to which school belonging may promote positive behaviors and deter negative behaviors. Existing research shows that school belonging may also have implications for social and emotional development, including substance use, depression, and emotional distress (Resnick et al., 1997). Examining connections to school may allow us to detect ways to improve well-being beyond academics. The current study's findings underscore the potential promise of future research on these issues.

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References

- 2010 Census Summary File. 2010. Retrieved from <http://census.gov/prod/cen2010/doc/sf1.pdf>
- Alfaro EC, Umaña-Taylor AJ, Bámaca MY. The influence of academic support on Latino adolescents' academic motivation. *Family Relations*. 2006; 55:279–291.
- Anderman LH. Academic and social perceptions as predictors of change in middle school students' sense of school belonging. *The Journal of Experimental Education*. 2003; 72:5–22.
- Aud, S.; Fox, MA.; KewalRamani, A. Status and trends in the education of racial and ethnic groups. Washington, DC: U.S. Department of Education, National Center for Education Statistics; 2010.
- Azmitia M, Cooper CR, Brown JR. Support and guidance from families, friends, and teachers in Latino early adolescents' math pathways. *The Journal of Early Adolescence*. 2009; 29:142–169.
- Baumeister RF, Leary MR. The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*. 1995; 117:497–529. [PubMed: 7777651]
- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107:238–246. [PubMed: 2320703]

- Between two worlds: How young Latinos come of age in America. Washington, DC: Pew Hispanic Center; 2009.
- Biddle BJ, Berliner DC. Unequal school funding in the United States. *Educational Leadership*. 2002; 59:48–59.
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. *Testing structural equation models*. Newbury Park, CA: Sage; 1993. p. 136-162.
- Conger RD, Donnellan MB. An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*. 2007; 58:175–199.
- Corwin, ZB.; Tierney, WG. Getting there and beyond: Building a culture of college-going in high schools. Center for Higher Education Policy Analysis; 2007. p. 1-26.
- DataQuest. 2013 Retrieved from <http://dq.cde.ca.gov/dataquest>.
- DeGarmo DS, Martinez CR. A culturally informed model of academic well-being for Latino youth: The importance of discriminatory experiences and social support. *Family Relations*. 2006; 55:267–278. [PubMed: 19554210]
- Diaz JD. School attachment among Latino youth in rural Minnesota. *Hispanic Journal of Behavioral Sciences*. 2005; 27:300–318.
- Eccles JS, Midgley C, Wigfield A, Buchanan CM, Reuman D, Flanagan C, Mac Iver D. Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist*. 1993; 48:90–101. [PubMed: 8442578]
- Espinoza G, Juvonen J. Perceptions of the school social context across the transition to middle school: Heightened sensitivity among Latino students? *Journal of Educational Psychology*. 2011; 103:749–758.
- Fuligni AJ. The academic achievement of adolescents from immigrant families: The roles of family background, attitudes, and behavior. *Child Development*. 1997; 68:351–363. [PubMed: 9180006]
- Gándara, P. *Fragile futures: Risk and vulnerability among Latino high achievers*. Princeton, NJ: Policy Evaluation and Research Center, Policy Information Center, Educational Testing Service; 2005.
- García Coll, C.; Marks, AK. *The immigrant paradox in children and adolescents: Is becoming American a developmental risk?*. Washington, DC: American Psychological Association; 2011.
- Gillen-O'Neel C, Fuligni A. A longitudinal study of school belonging and academic motivation across high school. *Child Development*. 2013; 84:678–692. [PubMed: 23002809]
- Gonzales NA, Germán M, Yeong Kim S, George P, Fabrett FC, Millsap R, Dumka LE. Mexican American adolescents' cultural orientation, externalizing behavior and academic engagement: The role of traditional cultural values. *American Journal of Community Psychology*. 2008; 41:151–164. [PubMed: 18085435]
- Goodenow C, Grady KE. The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *The Journal of Experimental Education*. 1993; 62:60–71.
- Hao L, Woo HS. Distinct trajectories in the transition to adulthood: Are children of immigrants advantaged? *Child Development*. 2012; 83:1623–1639. [PubMed: 22966927]
- Hazuda HP, Stern MP, Haffner SM. Acculturation and assimilation among Mexican Americans: Scales and population-based data. *Social Science Quarterly*. 1988; 69:687–706.
- Hispanics of Mexican origin in the United States. Washington, DC: Pew Research Center; 2009.
- Hurtado-Ortiz MT, Gauvain M. Postsecondary education among Mexican American youth. *Hispanic Journal of Behavioral Sciences*. 2007; 29:181–191.
- Ibañez GE, Kuperminc GP, Jurkovic G, Perilla J. Cultural attributes and adaptations linked to achievement motivation among Latino adolescents. *Journal of Youth and Adolescence*. 2004; 33:559–568.
- Juvonen, J. Sense of belonging, social bonds, and school functioning. In: Alexander, PA.; Winne, PH., editors. *The Handbook of Educational Psychology*. 2nd. Mahwah, NJ: Erlbaum; 2006. p. 655-674.
- Kao G. Social capital and its relevance to minority immigrant populations. *Sociology of Education*. 2004; 77:172–175.
- Kao G, Tienda M. Optimism and achievement: The educational performance of immigrant youth. *Social Science Quarterly*. 1995; 76:1–19.

- Kuperminc GP, Darnell AJ, Alvarez-Jimenez A. Parent involvement in the academic adjustment of Latino middle and high school youth: Teacher expectations and school belonging as mediators. *Journal of Adolescence*. 2008; 31:469–483. [PubMed: 17953983]
- LeCroy CW, Krysik J. Predictors of academic achievement and school attachment among Hispanic adolescents. *Children & Schools*. 2008; 30:197–209.
- Little TD, Cunningham WA, Shahar G, Widaman KF. To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*. 2002; 9:151–173.
- McDonald Connor C, Son S, Hindman AH, Morrison FJ. Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes. *Journal of School Psychology*. 2005; 43:343–375.
- Murray C, Greenberg MT. Children's relationship with teachers and bonds with school an investigation of patterns and correlates in middle childhood. *Journal of School Psychology*. 2000; 38:423–443.
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. 6th. Los Angeles, CA: Muthén & Muthén; 1998–2010.
- Ojeda L, Flores LY. The influence of gender, generation level, parents' education level, and perceived barriers on the educational aspirations of Mexican American high school students. *The Career Development Quarterly*. 2008; 57:84–95.
- Pong, S.; Zeiser, KL. Student engagement, school climate, and academic achievement of immigrants' children. In: García Coll, C.; Marks, AK., editors. *The immigrant paradox in children and adolescents: Is becoming American a developmental risk?*. Washington, DC: American Psychological Association; 2011. p. 209-232.
- Profile America. U.S. Census Bureau Facts for Features. 2013. Retrieved from http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb13-ff19.html
- Resnick MD, Bearman PS, Blum RW, Bauman KE, Harris KM, Jones J, Udry JR. Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *The Journal of the American Medical Association*. 1997; 278:823–832. [PubMed: 9293990]
- Roeser RW, Eccles JS, Sameroff AJ. Academic and emotional functioning in early adolescence: Longitudinal relations, patterns, and prediction by experience in middle school. *Development and Psychopathology*. 1998; 10:321–352. [PubMed: 9635227]
- Roosa MW, O'Donnell M, Cham H, Gonzales NA, Zeiders KH, Tein JY, Umaña-Taylor A. A prospective study of Mexican American adolescents' academic success: Considering family and individual factors. *Journal of Youth and Adolescence*. 2012; 41:307–319. [PubMed: 21863379]
- Taylor ZE, Larsen-Rife D, Conger RD, Widaman KF. Familism, interparental conflict, and parenting in Mexican-Origin families: A cultural-contextual framework. *Journal of Marriage and Family*. 2012; 74:312–327. [PubMed: 22736810]
- Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*. 1973; 38:1–10.
- Updegraff KA, Umaña-Taylor AJ, McHale SM, Wheeler LA, Perez-Brena NJ. Mexican-origin youth's cultural orientations and adjustment: Changes from early to late adolescence. *Child Development*. 2012; 83:1655–1671. [PubMed: 22966929]
- Valenzuela, A. *Subtractive schooling: US-Mexican youth and the politics of caring*. New York: State University of New York; 1999.
- Voelkl, KE. School identification. In: Christenson, SL.; Reschly, AL.; Wylie, C., editors. *Handbook of Research on Student Engagement*. New York: Springer; 2012. p. 193-218.
- Wang MT, Eccles JS. Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence*. 2012; 22:31–39.
- Widaman KF. III. Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development*. 2006; 71:42–64.
- Widaman KF, Ferrer E, Conger RD. Factorial invariance within longitudinal structural equation models: Measuring the same construct across time. *Child Development Perspectives*. 2010; 4:10–18. [PubMed: 20369028]
- Widaman, KF.; Reise, SP. Exploring the measurement invariance of psychological instruments: Applications in the substance use domain. In: Bryant, KJ.; Windle, M.; West, SG., editors. *The*

science of prevention: Methodological advances from alcohol and substance use research. Washington, DC: American Psychological Association; 1997. p. 281-324.

Yosso, T.J.; Solórzano, DG. Latino Policy & Issues Brief. Los Angeles, CA: UCLA Chicano Studies Research Center; 2006. Leaks in the Chicana and Chicano educational pipeline.

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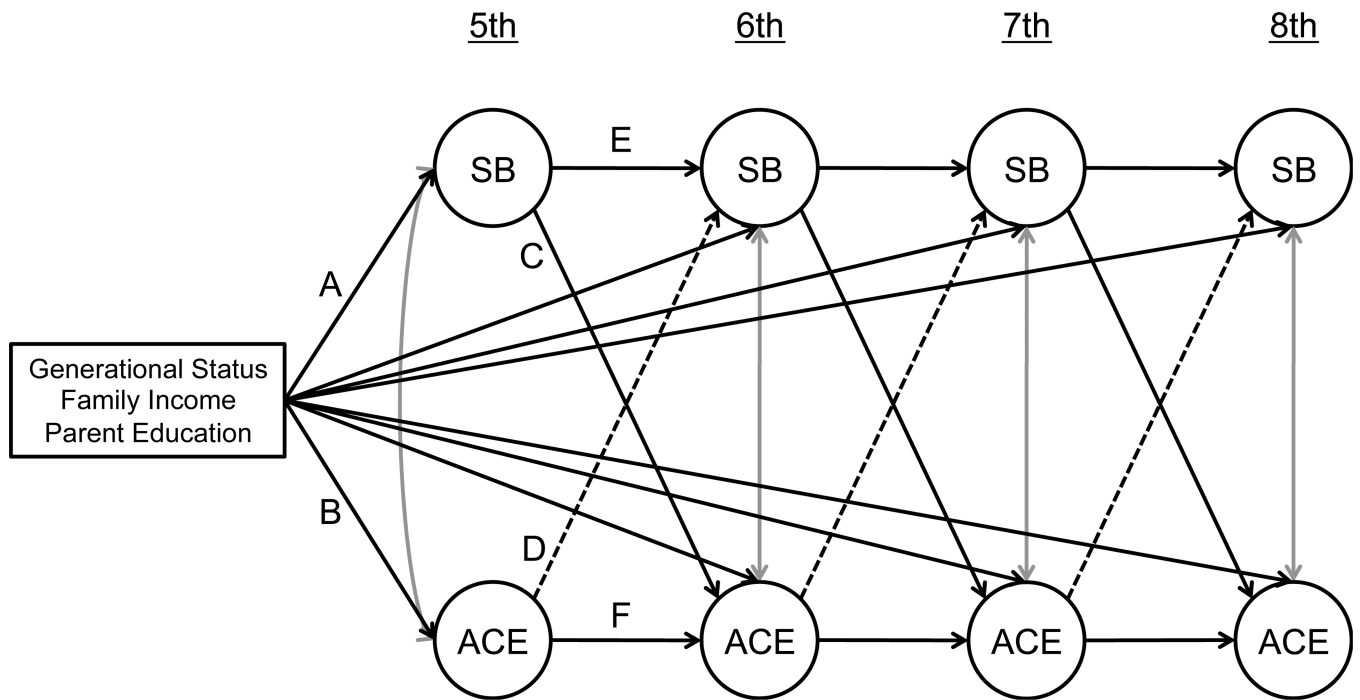


Figure 1. Conceptual model for the longitudinal associations among school belonging (SB), academic competence and academic expectations (ACE), generational status, family income, and parent education.

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Table 1

Intercorrelations for Latent Variables and Descriptive Statistics (N = 674)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1. 5 th School belonging | – | .57 ^{***} | .42 ^{***} | .22 ^{***} | .45 ^{***} | .30 ^{***} | .31 ^{***} | .33 ^{***} | .12+ | .16* | .20 ^{**} | .06 | .04 | –.09 |
| 2. 6 th School belonging | .27 ^{***} | – | .62 ^{***} | .39 ^{***} | .27 ^{**} | .49 ^{***} | .50 ^{**} | .27 ^{***} | .22 ^{**} | .25 ^{**} | .21 ^{**} | –.07 | –.02 | –.09 |
| 3. 7 th School belonging | .47 ^{***} | .43 ^{***} | – | .45 ^{***} | .23 ^{**} | .33 ^{***} | .55 ^{***} | .26 ^{***} | .07 | .35 ^{***} | .35 ^{***} | .02 | –.02 | –.01 |
| 4. 8 th School belonging | .35 ^{***} | .34 ^{***} | .61 ^{***} | – | .14 | .27 ^{***} | .35 ^{***} | .44 ^{***} | –.03 | .17* | .42 ^{***} | –.03 | .08 | –.02 |
| 5. 5 th Academic competence | .18* | .00 | .02 | .12 | – | .69 ^{***} | .61 ^{***} | .50 ^{***} | .22* | .15+ | .25 ^{**} | –.02 | .12+ | –.05 |
| 6. 6 th Academic competence | .20* | .23 ^{**} | .12 | .13 | .76 ^{***} | – | .66 ^{***} | .58 ^{***} | .22 ^{**} | .21 ^{**} | .30 ^{***} | .10 | .14* | –.06 |
| 7. 7 th Academic competence | .32 ^{***} | .15+ | .31 ^{***} | .20* | .50 ^{***} | .38 ^{***} | – | .71 ^{***} | .21 ^{**} | .35 ^{***} | .43 ^{***} | .03 | .01 | –.16* |
| 3. 8 th Academic competence | .24 ^{**} | .14+ | .31 ^{***} | .55 ^{***} | .45 ^{***} | .44 ^{***} | .62 ^{***} | – | .16* | .22 ^{**} | .45 ^{***} | .10 | .02 | –.17* |
| 9. 6 th Academic expectations | .12+ | .13* | .05 | .02 | .30 ^{***} | .32 ^{***} | .06 | .16* | – | .31 ^{***} | .16* | .17 ^{**} | .04 | –.05 |
| 10. 7 th Academic expectations | .21 ^{***} | .09 | .26 ^{***} | .16 ^{**} | .21 ^{**} | .19 ^{**} | .34 ^{***} | .19 ^{**} | .30 ^{***} | – | .49 ^{***} | .12+ | .16 ^{**} | .04 |
| 11. 8 th Academic expectations | .22 ^{***} | .10+ | .33 ^{***} | .39 ^{***} | .14* | .25 ^{***} | .25 ^{***} | .37 ^{***} | .19 ^{***} | .50 ^{***} | – | .14* | .21 ^{***} | .03 |
| 12. Family income ^a | .10 | .07 | .04 | .13+ | .22 ^{**} | .27 ^{***} | .21 ^{**} | .16* | .12* | .15 ^{**} | .15 ^{**} | – | .31 ^{***} | .23 ^{***} |
| 13. Parent education | .06 | .07 | .03 | .02 | .26 ^{***} | .18* | .02 | .02 | .06 | .01 | .09+ | .24 ^{***} | – | .33 ^{***} |
| 14. Child generational status ^b | .01 | .03 | .06 | .03 | .11 | .03 | –.06 | –.08 | .03 | .05 | .14 ^{**} | .29 ^{***} | .21 ^{***} | – |
| <i>M</i> | 3.60 | 3.65 | 3.50 | 3.43 | 3.86 | 3.89 | 3.85 | 3.74 | 5.72 | 6.34 | 6.31 | 7.29 | 9.26 | –.20 |
| <i>SD</i> | .40 | .38 | .43 | .46 | .83 | .81 | .73 | .77 | 1.43 | 1.42 | 1.39 | 4.26 | 3.31 | .58 |

Note. Correlations are reported below the diagonal (girls) and above the diagonal (boys).

^aFamily income was reported on a 20-point scale with \$5,000 increments (*M* = \$30,000–\$35,000, *SD* = \$15,000–\$20,000).

^b –1 = *first generation*; 0 = *second generation*; 1 = *third generation*. + *p* < .10.

* *p* < .05.

** *p* < .01.

*** *p* < .001.

Table 2

Cross-Lagged Regression Paths for Academic Competence and Expectations

| Grade | Model 1. Academic Competence | | | | Model 2. Academic Expectations | | | |
|-----------------------------------|---------------------------------|---------------------------|---------------------------|---------------------------|---------------------------------|-------------------------|---------------------|---------------------------|
| | SB → AC | AC → SB | AC → AC | SB → SB | SB → AE | AE → SB | AE → AE | SB → SB |
| 5 th → 6 th | .07* (.03) ^d | .01 (.04) ^b | .71*** (.05) ^e | .51*** (.03) ^h | --- | --- | --- | --- |
| 6 th → 7 th | .10* (.04) ^d | .01 (.04) ^b | .58*** (.05) | .52*** (.04) ^h | .16*** (.03) ^f | -.05 (.04) ^m | .26*** (.05) | .54*** (.04) ^q |
| 7 th → 8 th | -.06 (.05) | .01 (.03) ^b | .73*** (.05) ^e | .52*** (.04) ^h | .19*** (.04) ^f | -.05 (.03) ^m | .42*** (.04) | .57*** (.04) ^q |
| | GS → AC INC → AC EDU → AC | | | | GS → AE INC → AE EDU → AE | | | |
| 5 th → 5 th | -.07*** (.02) ^c | .08*** (.02) ^f | .11*** (.03) ^f | --- | --- | --- | --- | --- |
| 5 th → 6 th | -.07*** (.02) ^c | .07*** (.02) ^f | .10*** (.03) ^f | -.01 (.03) ⁿ | .09*** (.03) ^o | .06* (.03) ^r | | |
| 5 th → 7 th | -.07*** (.02) ^c | .08*** (.02) ^f | -.06 (.03) ^f | -.01 (.03) ⁿ | .09*** (.03) ^o | .06* (.03) ^r | | |
| 5 th → 8 th | -.07*** (.02) ^c | .07*** (.02) ^f | -.06 (.03) ^f | -.01 (.03) ⁿ | .09*** (.03) ^o | .06* (.03) ^r | | |
| | GS → SB INC → SB EDU → SB | | | | GS → SB INC → SB EDU → SB | | | |
| 5 th → 5 th | -.02 (.02) ^d | .03 (.03) ^g | .01 (.03) ^k | --- | --- | --- | --- | --- |
| 5 th → 6 th | -.02 (.02) ^d | .02 (.02) ^g | .02 (.02) ^k | -.04 (.05) | .03 (.03) ^p | .01 (.03) ^s | | |
| 5 th → 7 th | -.02 (.02) ^d | .02 (.02) ^g | .01 (.02) ^k | .03 (.04) | .03 (.03) ^p | .01 (.02) ^s | | |
| 5 th → 8 th | -.02 (.02) ^d | .02 (.02) ^g | .01 (.02) ^k | -.04 (.04) | .03 (.02) ^p | .01 (.02) ^s | | |
| Means: | 5 th | 6 th | 7 th | 8 th | 6 th | 7 th | 8 th | |
| M _{SB} | 3.60 ^{sb5} | 3.65 ^{sb6} | 3.50 ^{sb7} | 3.43 ^{sb8} | M _{SB} | 3.65 ^{sb6} | 3.50 ^{sb7} | 3.43 ^{sb8} |
| M _{AC} | 3.86 ^{ac5} | 3.89 ^{ac6} | 3.85 ^{ac7} | 3.74 ^{ac8} | M _{AE} | 5.72 ^{ae6} | 6.34 ^{ae7} | 6.31 ^{ae8} |

Note. Coefficients are standardized; standard errors are in parentheses. AC = academic competence; AE = academic expectations; SB = school belonging; EDU = parent education; INC = family income; GS = generational status. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean squared error of approximation. Covariates include gender and English language proficiency. Model 1 fit: $\chi^2(242) = 384.06$, CFI = .97, TLI = .96, RMSEA = .03. Model 2 fit: $\chi^2(140) = 240.02$, CFI = .98, TLI = .97, RMSEA = .03.

^{a-s} paths constrained to be equal. Reported means are observed and mean differences are based on the latent measurement models of Model 1 and Model 2: sb5, sb6 > sb7, sb8 ***; sb7 > sb8***; ac5 > ac7 *, ac5 > ac8 ***; ac6, ac7 > ac8 ***; ac7, ac8 > ac6***.

.100' >d

.10' >d
**
.50' >d
*

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