

Instrument Validation and Structural Equation Modeling of  
Motivational and Higher Education Orientations among  
Students of Mexican Descent in Rural Schools of the U.S. Pacific Northwest

Eric William Hamilton

A dissertation

submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2013

Reading Committee:

Susan B. Nolen, Chair

Min Li

Robert D. Abbott

Filiberto Barajas-Lopez

Erasmus Gamboa

Program Authorized to Offer Degree:

College of Education

© Copyright 2013

Eric William Hamilton

University of Washington

**Abstract**

Instrument Validation and Structural Equation Modeling of  
Motivational and Higher Education Orientations among  
Students of Mexican Descent in Rural Schools of the U.S. Pacific Northwest

Eric William Hamilton

Chair of the Supervisory Committee:

Professor Susan B. Nolen

Educational Psychology

The present study investigates use of Nicholls' (1989) Motivational Orientations Scales with high school students of Mexican descent in rural school settings, and the patterns of associations between motivational orientations and higher education orientations for students differing in gender, country of birth (nativity), grade level, and ethnic composition of school. Participants ( $n = 354$ ) completed a questionnaire including the Motivational Orientations Scales of the Theories of Schooling survey (Nicholls, 1989), questions pertaining to beliefs about higher education attainment, and demographics questions. Confirmatory factor analyses evidenced language and student sub-group equivalence of factor structure on a random split-half procedure. Correlational analyses revealed relationships between motivational orientations and higher education

orientations that evidenced unique patterns for different groups of students. Path models revealed distinct similarities and differences in sub-groups-based patterns between motivational and higher education orientations. Multivariate analyses of variance (MANOVA) showed an interaction effect between nativity and gender on higher education expectations, and a main effect of school ethnic composition on higher education aspirations. Results support use of the Motivational Orientations Scales with adolescents of Mexican descent in rural schools, and suggest consideration of gender, nativity, grade level, and school ethnic composition in interventions to address students' school achievement motivation and beliefs about higher education opportunities. Limitations and future directions are discussed.

**CHAPTER I: LITERATURE REVIEW**

Instrument Validation and Structural Equation Modeling of  
Motivational and Higher Education Orientations among  
Students of Mexican Descent in Rural Schools of the U.S. Pacific Northwest

U.S. schools are experiencing fast-paced changes in the demographic characteristics of their student populations, changes that have implications for the academic values and accountability practices that shape definitions of student success (Darling-Hammond, 2004; Gutierrez, 2006). High dropout rates and social and cultural inconsistencies, many of which defy traditional pedagogical and learning assessment approaches, stand in the way of the goals of increasing and maintaining the academic motivation, graduation rates, and higher education enrollment for marginalized students. In terms of these outcomes, the educational experiences of Latino students may need particular attention, as these students constitute the largest ethnic minority group in the U.S., and peoples of Mexican descent the largest portion of the Latino population (Pew Hispanic Center, 2012).

From a broad perspective, research focused on the educational trajectories of Latinos in the US claims that our Latino students are “remaking America,” transforming not only the demographic fabric, but also policy and curricula in K-12 education systems (Contreras, 2005; Suárez-Orozco & Pérez, 2002). However, while this is true across many regions of the United States, most educational research involving Latinos and students of Mexican descent has focused on the experiences of students in urban schools. Coming to understand the complex and distinct educational histories and trajectories of students of Mexican descent in rural contexts is a project as of yet little pursued, yet one that is crucial for improving the educational outcomes of this

growing and dynamic US population (Suárez-Orozco & Páez, 2002). The mining- and agriculture-based immigration of laborers from Mexico represents a history that has led to a large, stable, Latino population in the Pacific Northwest, a population with a rich history of labor negotiations and human rights struggles (Gamboa, 2000; Guzman, 2006). The legacy of this history is the present-day diversity of vibrant social collectives of heritages and lifestyles, on that makes the US Pacific Northwest one of the most valuable regions for research relevant to understanding the struggles and opportunities of contemporary rural students of Mexican descent.

For education stakeholders, such as teachers, administrators, and researchers engaged in the improvement of education for students of Mexican decent in U.S. high schools, the duties of not only educating this historically-marginalized, highly diverse, and growing population, but also of ensuring that the belief in attainment of higher education is an attainable goal for this student population, demand great responsibility and offer great challenges. As Contreras (2005) writes,

In a time when Latinos are the fastest-growing segment of the K-12 population in many states, early and continued investment must remain an imperative for both states and higher education systems. The disconnect between K-12 and higher education systems stymies the development of college-going cultures and infrastructures and facilitates inequitable access to higher education. Early and continued investment in Chicano/Latino students throughout the educational pipeline may create a more seamless continuum to higher education and contribute to the process of socioeconomic elevation, empowerment, and sustainability (p. 212).

Scholars seeking to understand adaptation, acculturation, and *transculturation* of the children of immigration (Suárez-Orozco & Suárez-Orozco, 1995, 2001), those who themselves have immigrated, or whose families have immigrated to the US, have leveraged various theoretical constructs or institutional practices to explain varying academic trajectories. These studies often point to factors such as ethnic identity (Matute-Bianchi, 1986; Perez & Padilla, 2000; Zarate, Bhimji, & Reese 2005), segregation and cultural exclusion (Gibson, Gándara, & Koyama, 2004; Valencia, 2002), achievement motivation (Gándara, O'Hara, & Gutiérrez, 2004; Waxman, Huang, & Padron, 1997) and cultural or social capital (Stanton-Salazar, 2004). By turning the investigative lens toward the variations in relationships between academic motivations and beliefs about higher education opportunities of students of Mexican descent, education stakeholders may be better-informed in the design of future curricula, policies, and research goals that, in turn, may function to empower this dynamic and diverse student population.

### **Educational Aspirations and Expectations among Students of Mexican Descent**

Research that assesses educational aspirations and expectations of Latino youth (e.g., Bohon, Johnson, & Gorman, 2006; Gándara, O'Hara, & Gutiérrez, 2004; Kao & Tienda, 1998, 2000) has produced mixed findings regarding relationships between student characteristics and college-going. In general, though, the constructs used to measure students' higher education orientations are defined in a straight-forward manner: *aspirations* are defined as reflections of one's hopefulness about future educational opportunities and achievement, whereas *expectations* are thought to be a person's consideration of the likelihood of achieving the academic goals to which one aspires (Bohon, et al., 2006). Although aspirations offer insight into students' beliefs about post-secondary educational opportunities, expectations are considered a more realistic self-assessment about one's educational future than are aspirations.

In her qualitative study, Ruiz Soto (2009) interviewed students who were documented and students who were undocumented, all of Mexican descent, in one Eastern Washington high school. Results of the study demonstrated that there are a number of factors influencing Latino immigrant students' higher education aspirations, some of which have to do specifically with group membership of the students. Overall, her findings were clear: all fifteen of her high school interviewees aspired to attend college after high school, and all of their parents had college aspirations for their children. Based on her consistent findings of both the immigrant students and their parents' pro-academic, college-oriented accounts, Ruiz Soto, drawing from the writings of Portes (2000), suggested a rearticulation of the concept of *cultural capital*, to include narratives of immigrant families' border crossings, the academic motivation that springs from parental expectations. Of note, however, in Ruiz Soto's study, participants' higher education aspirations mainly pertained to attending two-year community or technical colleges.

Some studies of educational futures of US students take a broad perspective, focusing on the U.S. Latino student population as one homogeneous group (e.g., Kao & Tienda, 1998). However, education-focused studies investigating differences between ethnic groups within the broader Latino population have helped to illuminate differing school outcomes for Latino subgroups identified in terms of gender, ethnic group, and immigration status. For example, Bohon, Johnson, and Gorman (2006) studied differences in educational aspirations and expectations among Latinos of different ethnic backgrounds, including students of Cuban, Puerto Rican, and Mexican descent. Results of their regression analyses showed that both aspirations and expectations were higher among students of Cuban descent than for students of Mexican and Puerto Rican descent, suggesting the need to disaggregate Latinos in such analyses. For example,

Bohon and colleagues (2006) did not include gender and gender-based interaction effects in their research.

Other studies have pointed to interactions between various forms of Latino student identity, including gender and ethnic identity. Gándara and colleagues (Gándara, et al., 2004) demonstrated that differences in higher education aspirations exist between students differing in terms of both ethnicity and gender. Their study found that the higher education orientations held by groups of ethnically diverse high school students' were influenced not only by students' perceptions of the academic standards that their friends held, but also by students' perceptions of the school ethos toward members of different ethnic groups, more specifically, how Latino students were regarded and treated in the school. Based on their findings, the researchers suggested that stakeholders account for the possible repercussions of emphasizing competitive and alienating school ethos: "aspirations appear to be shaped, at least in part, by the degree to which students feel a part of the enterprise of schooling" (Gándara, et al., 2004, p. 57). These findings fall well in line with research such as Valenzuela's (1999) ethnographic study of the positive academic effects conferred to Latino students when belonging and care are made priorities in school settings.

Other research has documented higher rates of Latino students' attending community colleges, versus attending four-year colleges and universities (Contreras, 2005; Ruiz Soto, 2009; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008). In her analyses using the 2003 College Entrance Examination Board data, a nation-wide sample of SAT takers, Contreras (2005) found that Mexican Americans constituted the highest percentage of first-generation college-going students. However, despite findings that access to higher education is increasing for more Latino students, the fact that the majority of Latinos who pursue higher education are attending two-

year community colleges is offset by further findings that Latino students evidence higher rates of non-completion at two-year colleges than at four-year colleges (Contreras, 2005; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008). Demonstrating that students of Mexican descent are motivated to attend colleges and universities is only part of the puzzle. Amid the sparse amount of research attending to academic achievement motivations of students of Mexican descent, more needs to be known about how combinations of group identities influence the relationships between motivational and higher education orientations of this growing and influential student citizen population.

### **Achievement Goal Theory and Motivational Orientations**

Achievement goal theory is an approach for understanding achievement motivation that aims to illustrate the relationship between students' motivations and their goals (Ames, 1992; Elliot & Dweck, 1988; Nicholls, 1979, 1989; Nolen, 1996). Achievement goals have been defined as "cognitive representations of the different purposes that students may have in different achievement situations and are presumed to guide students' behavior, cognition, and feelings as they become involved in academic work" (McInerney, Roche, McInerney, & Marsh, 1997).

Nicholls' intentional perspective of achievement goal theory posits that students hold *theories about schooling*, and that students' actions make sense when we understand their purposes: "The worlds students see are, to a significant degree, the worlds they want; their views about the way things are relate meaningfully to their personal goals" (1989, p.100). Students' behaviors in school, from this point of view, make sense in terms of the purposes they see in engaging in academic activities and pursuits, as well as in interacting with key persons in their academic contexts.

Two motivational states that have received particular attention in goal theory are task (or mastery) and ego (or performance) involvement. The distinction between task involvement and ego involvement lies in different conceptualizations of ability, which lead to distinct ways of feeling competent at an academic task (Nicholls, 1989). Individuals who experience a state of concern over their ability to perform a task, relative to the perceived ability of others, are said to be ego involved. In this norm-referenced monitoring of ability, one's self-appraisal depends on the most differentiated conception of ability, ability as capacity. However, if one wishes to understand, learn, or accomplish something that he or she did not know she could do, the person is defining her goal in terms of a less-differentiated conception of ability. In this case, one's conception of ability at the task, or task competence, is more closely construed as effort, such that the feeling of effortful accomplishment for the individual *is* the feeling of competence.

Interestingly, this last example is the way that young children construe ability. For young children, ability and effort, are self-referenced, such that competence is signaled by gains in level of performance or by an increasing sense of certainty that one can do or understand something. However, Nicholls and Miller (Nicholls & Miller, 1984) found that, by the 5<sup>th</sup> or 6<sup>th</sup> grade, children's conceptions of ability as capacity tend to predominate, meaning they reason that lower effort expended when engaging with a task indicates higher ability.

The fact that there is a change means that academic achievement motivation is a developmental aspect of students' cognitive and emotional relationships with tasks involved in schooling. Nicholls (1989, 1990) further defined *motivational involvements* as the experiential states of an individual in particular situations, whereas *motivational orientations* are individually developed differences in proneness to kinds of motivational involvement. Therefore, experiential activities, such as being a participant in schooling practices, can invoke in students

different motivational involvements, such as task and ego involvements, at different places, at different times, and toward particular kinds of learning activities. A preponderance of task or ego involvements in students' educational experiences can develop into longer-lasting motivational orientations toward particular tasks or contexts involved in schooling.

Investigations into students' theories about schooling have helped to cast light on particular groups of students who might see learning in school as less of a competitive, ego-involving endeavor, and more as a valuable end in itself (Nicholls, Patashnick, & Nolen, 1985; Nicholls, 1989). Working from the hypothesis that what students want in school is meaningfully related to what they believe one must do to succeed, Nicholls and colleagues (Nicholls, et al., 1985; Nicholls, 1989) developed and administered questionnaires to rural and urban high school students to investigate the relationships between students' beliefs about the purposes of school, what sorts of strategies lead to success in school, and students' motivational orientations. Results of their analyses showed systematic correlations among the scales included in the three elements of the questionnaire. Students whose responses indicated high task orientations toward school also indicated beliefs that school should help them to become responsible citizens, be persistent in the face of challenges, and learn about the world, and that students who succeed in school work hard, cooperatively, are interested in their school work, and try to understand concepts rather than just memorize content. Those students who scored high on the ego orientation scale believed that students who are successful emphasize doing better than others, being more intelligent, knowing how to impress others, acting like they like their teachers, and have teachers with high expectations of their students. Students who scored higher on the work avoidance, a scale constructed to tap students' intent to get out of doing school tasks, as well as students' sense of academic alienation, believed that schools should help students gain wealth

and status, and that successful students act like they like the teacher, know how to impress others, and are lucky.

Nicholls and colleagues concluded that to increase students' understanding and achievement motivation in school, academic mentors and stakeholders should find ways to encourage a task or learning orientation, and should promote the perception of learning in school as inherently valuable, as an end in itself (Nicholls, 1989). On the other hand, encouraging students' participation in school as a means to the end of gains in economic and social status, their study confirmed, may undermine their effortful engagement to learn and master school subjects (Nicholls et al., 1985).

It may interest stakeholders in the experiences of Latino youth in rural school settings to consider scenarios in which motivational orientations develop differently for groups of students experiencing diverse early experiences with schooling, differing levels of personal, social, and cultural transitions (Suárez-Orozco & Suárez-Orozco, 2001), and differing present-day forms of expectations and treatment in their US schooling. First, though, it will be beneficial that I provide a little more background on some of the nuances of achievement motivation theory.

### **Approach and Avoidance Motivational Orientations**

Motivation science is wrapped up in human cognitive and social development: studies investigating the links between task and ego goals, or motivational orientations, have shown that motivational involvements can have long-standing effects on students' motivational orientations and achievement outcomes (Elliot & Harackiewicz, 1994; Meece & Holt, 1993; Nolen, 1996). Nolen's (1996) review of the literature suggests that, while engaging with a learning task, students who evaluate their performance by how much is learned or accomplished exhibited more effortful engagement with future involvement in that task. Meece and Holt (1993), using

measures of engagement strategies, teacher ratings, grades, and test scores, found that task-mastery goals influenced elementary science students' engagement in science lessons and led to students' developing an adaptive achievement profile. These are examples of motivational approach goals, or approach orientations, and task/mastery and learning goals have traditionally been conceptualized as academic approach-related types of goals (Nicholls, 1989).

However, the influences of different kinds of goals or orientations have been found in subsequent studies. Some researchers suggest that task and ego orientations can be complementary (Hidi & Harackiewicz, 2000; Wentzel, 1991; Wentzel, 1993). Hidi and Harackiewicz (2000) contend that motivating unmotivated students may be best accomplished by attending to the multidimensional nature of motivational forces, and by involving combinations of goals and interests. Similarly, Wentzel (1991, 1993) suggests that if students wish to be successful in school, they should pursue both task/mastery and ego/performance goals.

On the other hand, the experimental methods employed by Elliot and Harackiewicz (1994) led to findings of students' heightened concerns relative to other students' performance levels, specifically about academic performance, significantly affected a change in the students' behavior, either in terms of withdrawal from further engagement with the task, or by decreased performance on the experimental task. These findings are evidence of a link between ego-based goals, or ego orientations, in Nicholls' terms (1989), and avoidance behavior in academic contexts.

Proponents of the multiple goals perspective of achievement goal theory have taken up the theoretical difference between the ways that ego or performance approach goals are linked to adaptive outcomes (Elliot, 1999; Harackiewicz, et al., 1997), on the one hand, and the ways that ego avoidance goals are linked to maladaptive outcomes (Elliot, 1999; Elliot & Church, 1997;

Elliot & Harackiewicz, 1996). However, findings in this area of study are still under empirical tension. Harackiewicz, et al. (2002) agree with Midgley, et al. (2001) that performance approach goals can have some negative consequences, such as help avoidance and low persistence, but suggest that more research is needed to clarify this empirical link.

### **Factors influencing Motivational Orientations of Ethnically- and Culturally- Marginalized Students**

The picture of relationships between motivational orientations, and how these relate to beliefs about academic opportunities, becomes more complex when we consider similarities and differences across cultural and ethnic groups of students (McInerney, Hinkley, Dowson, & Van Etten, 1998; McInerney, Roche, McInerney, & Marsh, 1997; Phinney, Baumann, & Blanton, 2001). For example, Phinney and colleagues (Phinney, Baumann, & Blanton, 2001) investigated differences in beliefs about effort versus ability attributions for goal achievement between students from five ethnic groups. The authors found that students from more marginalized groups, compared to their dominant culture-identifying peers, attributed academic success more to effort than ability, a finding the authors suggest relates to marginalized students' perception that they have to work harder than others to succeed in school. McInerney and colleagues (McInerney, et al., 1997) investigated self-report responses to items on the Inventory of School Motivation (ISM) instrument, sections of which contains constructs akin to task and ego orientations, to see whether items held similar meanings for middle and high school students from different cultural groups, including Anglo Australian, immigrant Australian, and three indigenous minority groups: Australian Aboriginal, Navajo Indian, and French-Canadian Betsiamite youth. Results showed similar factor structure models of goal orientations for each cultural group. However, the researchers' assumptions about the effect of cultural group

differences in the relationships between motivational orientations and academic sense of self were not borne out by their findings. Analysis of variance tests demonstrated that, even though the theoretically more marginalized Navajo and Betsiamite groups held greater task/effort orientations, they were also more competitive than the more mainstream Anglo Australian participants. A related study by McInerney and colleagues (McInerney, et al., 1998) found conflicting results. The researchers surveyed Aboriginal, Anglo, and immigrant Australian students about their school motivations. Contrary to prior findings, in this study, McInerney and colleagues (1998) demonstrated differences across groups in regard to the relationships between group membership and achievement goals. Whereas all groups felt school success relates to fulfilling mastery (or task) goals, the more marginalized Aboriginal student group, were less likely to equate success in school with satisfaction of mastery and performance needs than Anglo and immigrant Australian students.

While these findings provide evidence of patterns between academic motivations, the rarity of such studies, inconsistencies in the findings, and the fact that few have focused on Latino students, suggests the need for more empirical attention to the motivational orientations held by Latino students such as students of Mexican descent.

Many researchers investigating educational opportunities for marginalized students have found that Latino students, broadly defined, hold principled goals and high aspirations for leading successful academic lives (Gutierrez, 2006; Suárez-Orozco & Suárez-Orozco, 1995, 2001; Valdés, 1996; Valencia, 2002; Valenzuela, 1999). Nonetheless, stereotypes regarding low motivation and culture-wide anti-academic behaviors of Latino students are a continuing presence in US schools (Suárez-Orozco & Suárez-Orozco, 1995, 2001). The foundation for critiques of stereotype-based perspectives come from research that has shown that students'

academic repertoires and practices are malleable, and may indicate states of social participation, rather than traits inherent in members of groups (Gutierrez and Rogoff, 2003; Rogoff, 2004).

Therefore, it is crucial to recognize that researchers investigating the education of Latino students have illuminated a number of educational factors that stand to influence the motivations and college orientations of this student population, yet few have utilized the specificity of goal orientations constructs to assess these social-psychological patterns across the diversity of student groups that constitute US Latino student populations. Many of these studies have focused on a particular student characteristics, or combination of factors, such as gender (Smith, 2002; Suárez-Orozco & Suárez-Orozco, 1995), grade level (Gándara, O'Hara, & Gutiérrez, 2004), generational status (Smith, 2002; Suárez-Orozco and Suárez-Orozco, 1995, 2001; Valdés, 1996; Valencia, 2002; Valenzuela, 1999), and ethnic composition of schools (Gándara, et al., 2004; Gibson, et al., 2004; Suárez-Orozco, 2000; Suárez-Orozco & Suárez-Orozco, 1995, 2001). In the following sections, I review the literature pertaining to these particular factors, and how they may relate to students' motivational and college-going orientations.

### **Gender-based Influences on Motivations and Higher Education Aspirations**

Stereotypes of Latino gender roles and behaviors are often reproduced in academic contexts, and may have differential repercussions on male and female students' engagement with school, as well as with academic aspirations. Studies find that female Mexican-American students are more likely to successfully navigate school and social pressures than are their male peers (Smith, 2002; Suárez-Orozco & Suárez-Orozco, 1995). Female students of Mexican descent often have more structured lifestyle expectations from their parents and family members, such as living with the demands of returning directly home after school, often to help with household chores or looking after younger siblings. Mexican descent boys, on the other hand,

though possibly varying by factors such as immigration status, often face less-structured expectations, especially during adolescence, when an ethos of “making one’s way as a man” is emphasized by friends and family (Smith, 2002), leaving choices about school and work at the discretion of the adolescent male.

The lack of structure in many Latino boys’ lives may lead to involvement in non-school-related activities, many of which may challenge if not jeopardize school engagement (Smith, 2002). Gender-specific peer pressure may lead to interactions in male cohorts that undermine academic focus (Gándara, O’Hara, & Gutiérrez, 2004). Compound these social pressures with the fact that many Latino males report experiences in academic settings in which they feel marginalized or treated unequally based on their racial or ethnic characteristics (Gándara, et al., 2004; Stanton-Salazar, 2004; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008), and we see a combination of factors encouraging male students of Mexican descent to resist pressures, from family and school personnel alike, to achieve academically (Smith, 2002). Given these dynamics, we might expect female students of Mexican descent to feel quite marginalized in their school settings, leading to non-academically-oriented motivational goals, but also to be less distracted from academic pursuits than their male counterparts, even if their expectations for going away to attend college may be challenged by family expectations to follow traditional lifestyle choices.

### **Grade-level Influences on Motivation and Higher Education**

For students of Mexican descent, motivational and higher education orientations may change over the course of the high school years. Pressures to find work and income to provide financial support, help their family, or to get married and begin a family of their own may sway college-going plans (Suárez-Orozco and Suárez-Orozco, 1995). Family demands and social

norms influence the decision such that, by the time students have reached their senior year, many have made the decision of whether to go to college, or to postpone, if not forego, higher education and find a job after high school (Gándara, et al., 2004; Kao & Tienda, 1998). Such pressures may be most influential for immigrant students, and particularly for girls (Suárez-Orozco and Suárez-Orozco, 1995). Gándara and colleagues (Gándara, et al., 2004) found that while the majority of the Latino students across grades 9-12 surveyed in their study aspired to go to college, and one-third to nearly 50% expressed interest in enrolling in 4-year colleges, a significant majority of students choosing to attend 2-year colleges were Latinos in their last year of high school. For many Latino students, the economic feasibility and proximity to home may combine with family and cultural expectations to make 2-year colleges the more desirable choice. This being the case, aspirations to attend an institution of higher education could mean different things to different students: not all students will necessarily aspire to attend a four-year university.

Education stakeholders might assume that as students advance through their high school years, their anticipations for college attendance would increase (Gándara, et al., 2004; Kao & Tienda, 1998). For example, Stanton-Salazar's (2001) study of urban Latino students showed that younger high school students (sophomores compared to juniors and seniors), particularly Spanish-dominant students, were less likely to seek assistance with post-high school planning than their peers in later grades. If this is the case, younger, more recent immigrants, those often confronting the most social and academic pressures, and deciding whether to stay in school or drop out (Gándara, et al., 2004; Stanton-Salazar, 2004; Suárez-Orozco, Suárez-Orozco, & Todorova, 2008), would stand to lose out on valuable college-preparedness information that may otherwise sustain their academic motivations.

The literature appears to offer a mixed picture about influences of grade level on Latino students' motivational and higher education orientations. Although simply staying in school positively influences students' higher education aspirations (Gándara, et al., 2004), grade level appears to interact with gender and acculturation (e.g., English proficiency or immigration status) to influence whether Latino students maintain an orientation toward going to college, and type of college toward which they would orient.

### **Generational Discontinuities in Achievement Motivation**

Researchers of Latino education have focused considerable research toward understanding factors that influence disparate educational outcomes of students differing in generational status, that is, immigrant, or first-generation status students, versus second- or later-generation students of Mexican descent in U.S. schools (Portes & Zhou, 1993; Smith, 2002; Suárez-Orozco and Suárez-Orozco, 1995, 2001; Valdés, 1996; Valencia, 2002; Valenzuela, 1999). An important aspect of this area of study lies in assessing ways in which recent immigrant students hold different types of motivations toward schooling from their peers who may have more years of experience attending U.S. Schools (Suárez-Orozco and Suárez-Orozco, 1995, 2001). These motivations may not be equally stable and long-lived for different groups of students of Mexican descent. On one hand, research shows that students whose families immigrated multiple generations ago have greater ties to and support from local community members, potentially increasing expectations and support felt by young learners, and in turn giving a boost to academic motivation. On the other hand, immigrant students have been found to receive great encouragement from family with high aspirations that they live a better life than their parents and grandparents (Ruiz Soto, 2009; Suárez-Orozco and Suárez-Orozco, 1995, 2001) that helps to sustain their academic achievement motivation.

In their research specifically investigating generational status differences among Latino students, Suárez-Orozco and Suárez-Orozco (1995) hypothesized systematic relationships between generational status and achievement motivation. The researchers used the Thematic Apperception Test (TAT) (Murray, 1943, as cited in Suárez-Orozco and Suárez-Orozco, 1995) as a measure of participants' beliefs about performance situations in school. Their findings point to a tendency for students who are longer term residents of the U.S., and who therefore are more likely to have been socialized or acculturated to dominant U.S. norms and customs, to view the purpose of schooling more in line with economic and social status upward mobility, and to place less emphasis on beliefs that school is a place of learning and developing an understanding of one's world. The researchers concluded that, along with a shift in the psychological patterning of achievement motivation among students who immigrate to U.S. schools, their Mexican American peers of second generation or higher have a greater likelihood to develop ambivalence toward authority and schools in ways that are similar to their European-American peers.

Importantly, recent immigrant students did not evidence this ambivalence in Suárez-Orozco and Suárez-Orozco's (1995) study, pointing to the likelihood that such ambivalence is a product of students' long-term experiences and identification as marginalized students in their U.S. schooling contexts. These findings coincide with studies that show youth of Mexican descent from families who may have resided in the U.S. for multiple generations (second-plus generational status) face greater prospects of being schooled in low-track, remedial courses (Valencia, 2002), and declining achievement motivation over time (Suárez-Orozco & Suárez-Orozco, 2001).

Based on their findings, Suárez-Orozco and Suárez-Orozco (2001) suggest researchers and practitioners consider the perspective that children of immigration undergo a process of

*transculturation*. During this process, youth are interacting with new kinds of people and viewpoints, and are constructing hybrid identities between their previous ethnic cultures and their experiences in their new, often ethnic majority-dominant cultural contexts. Immigrant students often encounter various forms and levels of pressure to assimilate to dominant cultural and institutional norms and beliefs. Challenges to students' beliefs about their academic opportunities during this transitional period have been linked to immigrant students' loss of academic motivation (Suárez-Orozco and Suárez-Orozco, 2001), and loss of aspirations for higher education (Gándara, O'Hara, & Gutiérrez, 2004).

Gutiérrez (2008) and Suárez-Orozco and Suárez-Orozco (2001) each invoke the metaphor of the *toxic mirror* to illustrate the propensity for educators and educational structures to reflect negative representations to immigrant students. The figurative mirror shows immigrant students how relatively marginalized, different, and disempowered they are, compared to most other students. Mainstream students, on the other hand, are often offered a window by which to see what may lie in their futures as a result of academic effort and success. Clearly, connections may be drawn between schooling practices that involve such toxic mirroring and Valenzuela's (1999) findings of differential treatment and motivation attributable to the practice of *subtractive schooling*. Furthermore, implications of the connections between the findings by Suárez-Orozco and Suárez-Orozco (1995) of generational differences in the achievement motivation of students of Mexican descent and Nicholls' (1989) concerns over the dangers of fostering and sustaining a competitive ethos in U.S. schools must not be underestimated. Competitive, high-stakes educational approaches may stand to undermine the very types of achievement motivation that schools are hoping to engender in their students, and that immigrant student groups often already embody as they engage with US schooling environments and practices.

**Ethnic Composition of Schools**

U.S. schools have been described as increasingly ethnically-and culturally-heterogeneous social spaces (Suárez-Orozco, 2000; Suárez-Orozco & Suárez-Orozco, 2001). This cultural and ethnic diversification has implications for both urban and rural schools, not only in terms of new curricula and academic and accountability practices (Darling-Hammond, 2004), but also in terms of further stratification of students into different social, economic, and cultural groups. Some students may adapt to such changes, or continue to excel, supported by the structures and affordances from which they already benefit. However, students' cognitive and emotional responses to schooling practices and social environments may differ across groups with differing cultural-historical backgrounds (Gutierrez and Rogoff, 2003). Thus, changes in the ethnic composition of student populations in schools may have differing effects on student motivations and future academic orientations.

In schools where white students comprise the majority of the school population, and students of Mexican descent a smaller percentage of the student body, the sense of marginalization felt by students of Mexican descent may be felt more acutely, and may have more profound effects on students' motivation and engagement with school. In their study of urban and rural Latino students, Gándara and colleagues (Gándara, et al., 2004) found that rural Latino students felt pushed out of the mainstream by the prevalence of activities and celebrations that involved the White students in their school, and that this had a negative impact on students' aspirations to continue with schooling into higher educational opportunities. This was particularly problematic for Latino males in their Latino-minority sample, who reported low levels of caring about how well they did in school, which can be seen as a form of academic alienation. Based on the findings of their study, Gándara and colleagues theorize that

participating in activities that can build social capital (Portes, 2000; Stanton-Salazar, 2004), such as networking with peers who may help socialize students to the dominant norms of achievement, may be very difficult in school contexts where certain groups of students are marginalized and isolated from mainstream social contact and behavioral norms of the school.

By way of example, Gibson and colleagues (Gibson, et al., 2004) conducted a study in a 50% Latino-populated high school. Even in a school in which Latinos constituted half of the student body, migrant students of Mexican descent felt largely alienated from academic opportunities from which white students and later generation Latinos benefitted. It is noteworthy, however, that there were structural features of the school that assisted migrant students. Students who were members of the school's Migrant Student Association (MSA), a program aiming to elevate group pride and academic achievement among migrant students, were found to nurture a culture of inclusiveness, information sharing, and academic engagement.

### **Student Dissent in Ethnically-marginalizing Rural Schools**

It is not only Latino culture, writ large, confronting normative, majority white ways of being that evoke clashes of ethnic and cultural perspectives in rural schools. Valenzuela (1999) and Valdés (1996) note that students of Mexican descent who originate from or who immigrate to agrarian communities often participate in cultural practices that reinforce traditional Mexican cultural values. Whereas the values embedded in the Latino concept of *educación*, including deference to persons in positions of authority and certain acts of politeness in social settings (Valenzuela, 1999), may be supported and cultivated in the immigrant Latino home, these values may or may not be a part of more long-standing, multi-generational families of Mexican descent, and are perhaps even less likely to be supported by majority White households, who may align more with the dominant, competitive ethos of American schooling (Gándara, et al., 2004). As

such, when schools push such a dominant American achievement ethos, rooted in competition and one-upmanship (Nicholls, 1989), upon students recently-immigrated from Mexico, these students, experiencing their own processes of transculturation (Suárez-Orozco & Suárez-Orozco, 2001), may find themselves confused about how to behave in different schooling situations (Gándara, O'Hara, & Gutiérrez, 2004). The already-existing orientations toward hard work and learning that these students bring to their US schooling opportunities may be coupled with a task orientation-threatening ego-based school involvement, focused not on learning, but rather on showing their peers and their teachers that they can perform well at their academic tasks, compared to their peers.

The pressures of ego involvement may lead to academic avoidance involvements. That is, many students may respond to pressures to acculturate by finding ways to resist the expectations of those whom they see as the producers of such pressures (Anzaldúa, 1987; Kohl, 1994; Suárez-Orozco & Suárez-Orozco, 2001; Valenzuela, 1999; Willis, 1981). As Kohl (1994) points out, some students may even willfully “not-learn,” resisting academic engagement, in such pressured situations. Such resistant behavior may be based on beliefs that what the school aims to teach its students is out of line with students’ cultural values or norms (Suárez-Orozco & Suárez-Orozco, 2001; Valdés, 1996; Valenzuela, 1999). Marginalized students may respond to the toxic mirroring of US schooling, and their resistance may indicate a form of rejection of the society that they see as rejecting them or their cultural orientations, activities, and characteristics (Kohl, 1994; Suárez-Orozco & Suárez-Orozco, 2001). This resistant orientation may have direct implications for students’ engagement with schooling, and their future academic aspirations.

In addition, and directly related to the pressures to assimilate to school norms, academic tracking programs, which often separate students of Mexican descent based on academic

performance or language proficiency, may further alienate students by implying a normative judgment about the group's intellectual abilities and future academic prospects (Hurd, 2004). Latino students facing constant or even occasional discrimination and social segregation may develop a sense of social alienation (Gibson, Bejinez, Hidalgo, & Rolón, 2004; Suárez-Orozco & Suárez-Orozco, 1995, 2001). In sum, circumstances that make youth feel alienated or marginalized from the academic activities of the school may lead students to disengage from or become work avoidant toward academic pursuits, with clearly detrimental effects on their higher education opportunities.

However, students of Mexican descent are not always the minority student population in rural schools. In rural Washington State, there are some communities where the Mexican descent population is eclipsing the historically white majority population. In these communities, the school population is composed of a majority population of students of Mexican descent. One might imagine, despite the history of segregation in these rural towns (Guzman, 2006), that this difference in school composition may offset the alienation felt by immigrant and later generation students of Mexican descent. Few studies, however, have investigated the achievement motivations of students in rural, Latino-majority schools (see Gibson, et al., 2004), and perhaps none have assessed the relationships between school motivations and higher education orientations. Research is needed to determine whether negative academic implications of alienation faced by students in Latino-minority schools (Gándara, et al., 2004) also exist in Latino-majority schools.

### **Influences of Interacting Factors on Motivational and Higher Education Orientations**

Students of Mexican descent may not experience the influences of only one of the factors illustrated above. Rather, their academic trajectories may be a complex combination of identities.

From a goal theory standpoint, their motivational involvements may develop into differing orientations as they recurrently interact with different contexts and people over the course of their school careers (Muis & Edwards, 2009). The diversity of identities and characteristics that students of Mexican descent embody, for example, in terms of gender, generational status, and grade level, may be more emphasized in certain academic contexts or situations than in others, and these identities may interact in those various contexts to differentially influence students' motivations and thoughts about higher education.

### **Use of Achievement Motivation Instruments in Studies with Rural Students and Students of Mexican Descent**

Few studies have focused specifically on academic motivations of students of Mexican descent, and even fewer on this student population in rural contexts. In one exception, however, Hardré and colleagues (Hardré, Crowson, Debacker, & White, 2007) tested a structural model of achievement motivation goals not specifically with students of Mexican descent, but focusing specifically on rural high school students. The researchers hypothesized that supportive classroom climate and perceived ability and usefulness (instrumentality) would influence rural students' achievement goals, which would in turn influence students' school engagement and effort. Their analyses of a 900 student sample verified their hypothesis that students' perceptions of supportive teacher behaviors and beliefs positively predict perceived ability and instrumentality, which in turn positively predict learning goals, which positively predict school effort and engagement. Furthermore, perceived ability negatively predicted performance avoidance orientation, which in turn negatively predicted school effort and engagement. One relationship that countered the researchers' hypotheses was that perceived ability positively predicted performance approach orientation. However, positive relationships between

performance approach orientation and pro-academic behaviors, such as persistence, intrinsic motivation, and higher academic aspirations, have been demonstrated in prior research (Elliot, 1999). Although Hardre and colleagues' (2007) study did not specifically involve students of Mexican descent in rural schools, their findings demonstrate that the relationships found between goal orientations and school performance factors commonly found in the achievement motivation literature (Hidi and Harackiewicz, 2000; Nolen, 1996) hold for youth in rural contexts.

Among those motivation-oriented studies that have been conducted with Latino students, many focus on Latinos students broadly, or, if assessing motivation of students of Mexican descent, have focused on urban schooling. For example, Plunkett and Bámaca-Gómez (2003) studied factors that influenced academic motivation and higher education aspirations of students of Mexican descent in Los Angeles schools. Academic motivation was measured in their study with a five item measure relating to school effort, importance of grades and education, finishing homework on time, and liking school. Regression analyses demonstrated that educational aspirations were higher for girls, and for students with parents with higher educational attainment, and those from homes where English was primarily spoken.

Alfaro and Umaña-Taylor (2010) administered the same academic motivation measure that was employed by Plunkett and Bámaca-Gómez (2003), as a component of their structural equation models (SEM), to assess gender-based differences in the relationships between academic support from siblings and academic motivation for urban Latino adolescents. Results of their multiple-group structural equation models demonstrated that support from siblings bolsters Latino boys' and girls' academic motivation, but that sibling relationship quality had an effect only on the girls' level of effort in school.

Although such links have been found between student characteristics and academic motivation of students of Mexican descent (Alfaro and Umaña-Taylor, 2010; Plunkett & Bámaca-Gómez, 2003), the measures of student motivation have been quite limited. A goal orientations survey, such as Nicholls' (1989) MOS, may be more effective at locating similarities and differences in students' motivational orientations, and may include constructs that would be more salient to students of Mexican descent, particularly for those students who may experience alienation in their school contexts, through its measures of ego and work avoidance orientations.

### **Response Equivalence in Achievement Motivation Inventories**

Given evidence of different cultural-historical viewpoints toward schooling and learning (Gutiérrez and Rogoff, 2003; Rogoff, 2004; Suárez-Orozco and Suárez-Orozco, 1995; Valdés, 1996), researchers cannot assume that the ways that students interpret survey items, as evidenced in their responses, will be equivalent across different participant groups. Assessment of the equivalence of latent factor structures, by use of confirmatory factor analysis (CFA) across groups from whom responses have been gathered, is considered a necessary quantitative procedure in order to proceed with further statistical analyses such as groups means difference tests (e.g., ANOVA) and regression (Byrne, Shavelson, & Muthén, 1989; Byrne, 2006).

Motivation researchers using quantitative survey methods have focused efforts on improving the validity and utility of survey instruments that measure students' goals and strategies, such as the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & Garcia, 1991), the Patterns of Adaptive Learning Survey (Midgley, Kaplan, Middleton, et al., 1998), and the Goal Orientation and Learning Strategies Survey (GOALS-S) (Dowson and McInerney, 2004). Such research aims to adjust survey attributes (item wording, reduce number of items, etc.) to achieve invariance of factor structures across participant groups according to

characteristics such as gender (Dowson & McInerney, 2004) and culture (King & Watkins, 2011; McInerney, Hinkley, Dowson, & Van Etten, 1998; McInerney, Roche, McInerney, & Marsh, 1997; Suliman & McInerney, 2006).

For example, the GOALS-S (Dowson & McInerney, 1998, 2004) inventory measures a number of the constructs that are of interest for measuring motivational orientations, including task and ego orientation, and has been validated for equivalence of factor structure across gender-based response participant groups. The procedure followed by Dowson & McInerney (2004) involved construction of items through interview sessions with high school students, administration of all items to students, factor analysis of the survey responses, and removal of items from their factor models until suitable improvements in model-to-data fit were achieved for each gender-based model. More recently, King and Watkins (2011) tested the validity and reliability of the GOALS-S by administering the survey to English-speaking Filipino students in an urban university in the Philippines. Using confirmatory factor analyses, their study confirmed the construct validity of the GOALS-S among Filipino students in urban contexts. King and Watkins (2011) list the urban and English-only schooling contexts in which they administered the GOALS\_S to be limitations of their study, and suggest testing the validity of the GOALS-S in rural educational contexts. Indeed, McInerney and colleagues (McInerney, et al., 1997) explicitly suggest this approach, recommending further validation of goal orientation surveys by administering “an intact instrument that has been well validated in one cultural setting to determine the extent to which it can be applied intact with other cultural groups” (p. 220).

By way of further example, in the case of the present study, because some students represent recently-arrived immigrants from Mexico, and, therefore, many students could only respond to a Spanish version of the survey, investigating the measurement invariance between

the responses to English and Spanish versions of the instrument is necessary before further inferential statistics can be investigated. If survey responses were found to be invariant across groups, the scales can then be used to further investigate and potentially validate findings such as the intra-group differences in achievement motivation among Latino students reported by Suárez-Orozco and Suárez-Orozco (1995).

### **Prior Validation of Nicholls' Motivational Orientations Survey**

Nicholls' Motivational Orientation Scales (MOS) (Nicholls, 1989; Nicholls, et al., 1985) is an achievement goal theory-based instrument that has been validated extensively in prior studies (Jagacinski & Duda, 2001; Nicholls, 1989; Duda & Nicholls, 1992; Nolen, 1988, 1996; Nolen & Haladyna, 1990). In one of the more extensive validation studies involving the MOS, Jagacinski & Duda (2001) tested the validity of the MOS against that of the Patterns of Adaptive Learning Scales (Midgley, et al., 1997, 2000), using responses from college students. The PALS showed somewhat better construct validity, compared to the MOS, with better model fit indices from their confirmatory factor analyses. However, the authors' tests of convergent validity showed mixed results when assessed with correlations between the motivational orientations scales of the PALS and MOS, Jackson's Achievement Motivation Scale (as cited in Jagacinski & Duda, 2001) and Duda & Nicholls' (1992) subscales of beliefs about school success and boredom/enjoyment scales. The MOS performed more consistently than the PALS in terms of correlating with the Jackson's Motivation Scale, although not as well as the PALS on the expected positive correlation with enjoyment, nor on the expected negative correlation between Task orientation and the belief that natural ability (rather than effort) is required for school success. However, Jagacinski and Duda point out that the particular PALS task scale that they used (Midgley, et al., 1996) contained three items that measured intrinsic interest or affect, which

the MOS task scale did not, a quality of the items which may lead to greater correlation with enjoyment. Incidentally, Midgley and colleagues (Midgley, et al., 2000) revised the task scale items to remove this affect bias in their scale, although at this time an MOS-to-revised PALS comparison could not be found in a literature review. Furthermore, the MOS scales were formulated for and validated by Duda and Nicholls (1992) with high school student participants, for whom task orientations may not be as elevated as for students who have been selected into higher education institutions. Despite the stated limitations of each, based on their analyses, Jagacinski and Duda suggest that both instruments, the PALS and the MOS, may be used to validly measure motivational orientations.

In my previous research, I tested the validity of the MOS (Hamilton, 2010) among students primarily of Mexican descent in four rural high schools in Eastern Washington State. Although my analyses demonstrated a strong evidence of construct validity, the factor analyses conducted in the 2010 study included a small subset of students identifying as white/non-Latino. Whereas Nicholls and colleagues (1985) found three motivational orientation factors: *work avoidance*, *ego orientation*, and *task/learning orientation*, my confirmatory factor analysis revealed four motivational orientation factors: *work avoidance*, *ego orientation*, *task/learning orientation*, and *work hard* orientation. The motivational orientations section of the instrument showed good model-to-data fit indices in the confirmatory factor analyses, and the modeled data showed invariance across language (English and Spanish response) and place of birth or nativity (U.S. or Mexico). However, this may be one of the only analyses attempting to validate the MOS specifically among marginalized students, and is very likely the only instance of its use with a sample specifically inclusive of Mexican descent students. Validation of the MOS with a sample of students specifically identifying as being of Mexican descent stands to inform the goal

theory literature, particularly in light of prior findings of inter-group equivalence among other achievement goal scales (McInerney, et al., 1997; McInerney, et al., 1998), as well as to illuminate the patterns of achievement goals and beliefs about higher education that may differ between mainstream and marginalized students of Mexican descent (Suárez-Orozco & Suárez-Orozco, 1995; McInerney, et al., 1997).

**CHAPTER II: RESEARCH GOALS AND HYPOTHESES****Overarching Goals and Research Questions of the Present Study**

The present study principally aims to address the theoretical differences in the patterns of relationships between motivational orientations and higher education orientations across student groups, by, in part, comparing structural path models of these relationships across survey samples of subgroups of students. Furthermore, although it is not the central focus of this study, establishing that interpretations of Nicholls' Motivational Orientation Scales (Nicholls, 1989; Nicholls, Patashnick, & Nolen, 1985) are valid (that it measures constructs that the scales are intended to measure) and fair (that it measures those constructs equivalently across groups of respondents) (Tabachnick & Fidell, 1996) with this all Latino-identifying student group is a critical step before conducting further statistical tests with the data. The overarching goals of the current study are:

1. to determine whether survey responses are non-invariant across language of survey (English versus Spanish) among student respondents of Mexican descent;
2. to determine whether the patterns of relationships between motivational orientations and higher education orientations differ between subgroups of students differing in terms of gender, generational status, grade level, and the ethnic composition of rural high schools.

Based on these goals, the present analyses are premised on the following research questions:

- 1) Can the Motivational Orientation Scales be used to measure motivational orientations within a sample population involving only immigrant and US-born adolescent students of Mexican descent?

- 2) Do the patterns of relationships between students' motivational and higher education orientations differ in terms of students' gender, generational status, grade level, and/or the ethnic composition of rural high schools? Are these patterns statistically different by constellation of group membership?
- 3) Are their mean difference effects on higher education aspirations and expectations based on students' gender, generational status, grade level, and/or the ethnic composition of schools of attendance?

### **Hypotheses.**

**Invariance hypotheses.** Given prior findings of cross-group scale equivalence in survey scales measuring motivational orientations (Dowson & McInerney, 2004; McInerney et al., 1997; McInerney et al., 1998, Hamilton, 2010), CFA-based invariance tests, conducted on the motivational orientations items from the Theories About Schooling inventory, are hypothesized to produce equivalent factor structures for Spanish and English language response groups.

In previous analyses of this data set (Hamilton, 2010) students identifying as White/Non-Latino were included in the sample (viz., sample sizes for CFA analyses were somewhat larger, equaling 377 and 385, for Language and Nativity, respectively). The present analysis specifically tests for invariance of the factor structure with only those students identifying as being of Mexican descent. With the slight reduction in sample size and in ethnic identification in the samples composing each analysis, I expected that the data may not conform to the identical structures evidenced in my prior analyses.

Lastly, research findings differ regarding the links between Ego Orientation and Approach- versus Avoidance orientations and behaviors (Elliot & Harackiewicz, 1996; Midgley, et al., 2001). Therefore, Ego orientation is theorized to associate, to some degree, to both

approach and avoidance types of orientations.

**Structural equation models (path models) hypotheses.** Given evidence in the literature of relationships between motivational goals and higher education aspirations for Latino students, based on gender and nativity (e.g., generational status) (Alfaro & Umaña-Taylor, 2010; Bohon, et al., 2006), and grade level and school composition (Gándara, et al., 2004), significant and positive relationships between Approach-related academic orientations (composed of Task and Work Hard motivational orientations) and higher education orientation (composed of both aspirations and expectations) are hypothesized for male and female students, earlier and later high school grade levels, US-born students, and students in Latino Majority schools. Conversely, negative or non-significant relationships are expected for all students between Avoidance-related academic orientations (composed of Work Avoidance and Alienation motivational orientations) and higher education orientation. Ego Orientation is anticipated to relate to both approach and avoidance related orientations, though perhaps to differing degrees.

Combining first-order latent factors of motivational orientations scales according to the second-order latent factors onto which they load will allow for a more nuanced interpretation of the student groups-differentiated patterns of relationships suggested in research question 2. These are expected to resolve into two latent factors: an Academic Approach orientation, and an Academic Avoidance orientation. With regard to these latent factors, the relationship between Approach Orientation and Avoidance Orientation is expected to be negative or unrelated for all student groups. Because of the varying usage of the aspirations and expectations for higher education constructs in the literature (e.g., Bohon, et al., 2006), I have chosen to assess the relationships of a composite latent construct of both measures onto the Academic Approach and Avoid orientations, and expect this construct to relate positively to Academic Approach

orientation and negatively to Academic Avoidance orientation.

**Correlations hypotheses.** In view of the theoretical difference in the constructs of higher education aspirations and expectations, it is anticipated that, if significant relationships are found, higher education expectations will relate to the motivational orientations variables less strongly, compared to higher education aspirations. Correlations between the motivational orientations are expected to differ for particular groupings of students. Specifically, while negative relationships are anticipated between Approach-related and Avoidance-related orientations for all subgroups of participants, the magnitude and degrees of significance of negative relationships between these orientations types are expected to be greater for students who are found in the literature to be more marginalized among Latino adolescents: females, students in lower-level grades, immigrant students, and students in Latino minority schools.

**Group differences hypotheses.** Given the documented history of greater marginalization of particular groups of Latino students in US schools (Gándara, et al., 2004; Stanton-Salazar, 2001; Suárez-Orozco & Suárez-Orozco, 2008; Valenzuela, 1999), I hypothesized that greater higher education aspirations and expectations would be evidenced by male and US-born students, and students in Latino majority schools, compared to students who are female, immigrants, and who attend Latino minority schools. Because students who have stayed in high school longer are more likely to anticipate college as a viable option (Gándara, et al., 2004), I expected students in higher grades to evidence greater higher education aspirations and expectations than those at the beginning of their high school years.

Figure 1 presents the general research model used in the structural equation modeling of this study, including the proposed relationships between second-order latent factors of Academic Approach and Avoidance motivational orientations and higher education orientation.

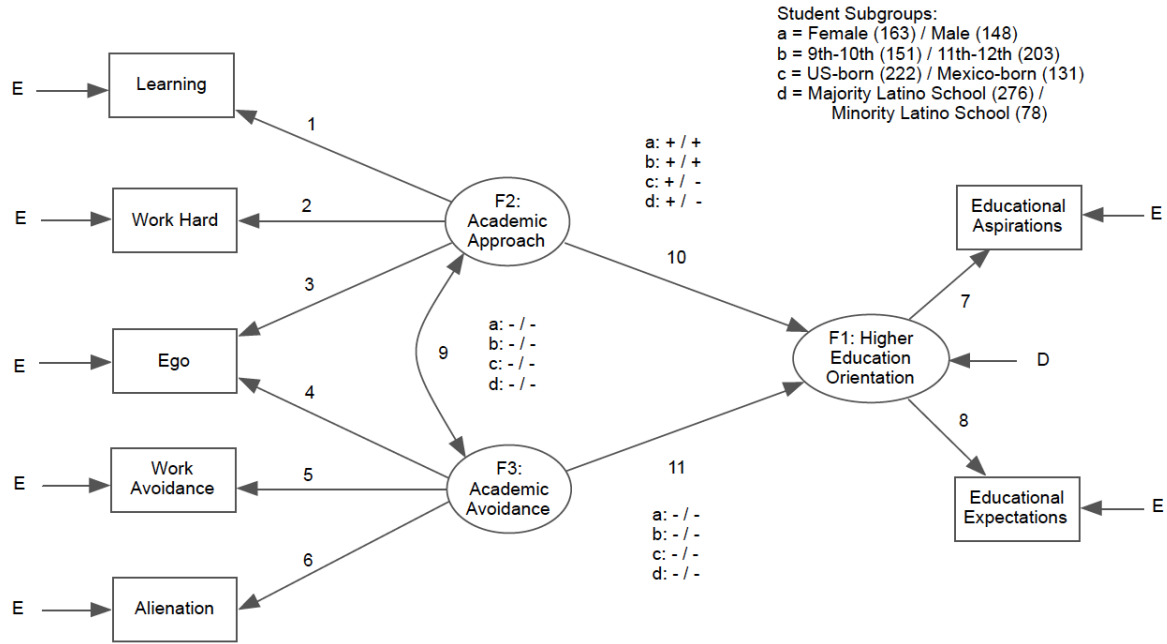


Figure 1. Theoretical path model of relationships between motivational and higher education orientation for subgroups of students of Mexican descent.

**CHAPTER III: METHOD AND PROCEDURES****Method****Participants**

High school students (grades 9-12) from 27 classrooms in 4 high schools (*sample sizes* = 122, 76, 79, 76) participated in the study in Autumn semester of the academic year. Participating high schools were located in rural school districts dispersed geographically in Eastern Washington State. Of the 421 students who completed some or all of the questionnaire, the present analyses included 354 students who self-identified as Mexican-American ( $n = 166$ ), Mexican ( $n = 193$ ), and/or Chicano ( $n = 55$ ), on the demographics information portion of the questionnaire (female = 163, male = 147, undeclared gender = 44). Of the 354 respondents, 128 identified as first generation status, and 220 identified as 2<sup>nd</sup>-, mixed-, or 3<sup>rd</sup> plus-generation status (six students did not respond to this question).

**Procedure**

Participants were recruited during the Autumn quarter of the 2007-2008 academic year. The author made telephone contact with school principals to ask permission to conduct the study and explain the purposes and design of the study. In schools where permission was given by administrators, teachers were contacted, and with their approval, a date for survey administration was scheduled. Homeroom teachers solicited student participation through scripted, email-delivered announcements informing students about the study and participation. Teachers distributed information forms and letters of consent in English and Spanish for students to take home. The same forms were mailed to students' homes through each school's attendance office.

Data collection occurred during the Winter months of the Autumn semester in participating classrooms. The author visited participating classrooms to administer

questionnaires. Students completed questionnaires during regular education classes. The author read a form, in English and in Spanish, that explained the purposes of the study as seeking students' views on what it means to them to go to, and to succeed in, school. Also in the form was an emphasis on the importance that, during administration of the questionnaire, the students not discuss their responses and respond to the survey items with their own, individual points of view. The author then gave students time to ask questions about participating in the study, and answered questions in English, Spanish, or both languages. After determining that students understood the purposes of the study and that their responses would be kept confidential, the author handed out questionnaires, read through the example items with the students, asked for last minute questions, and asked students to begin. Students who did not participate, or who finished early, worked on other schoolwork. The author collected completed questionnaires in an envelope, and, when all students had handed in questionnaires, asked for and addressed students' questions. The information session, survey administration, and answering of follow-up questions lasted between 20 and 35 minutes per classroom.

### **Measures**

**Theories About Schooling Questionnaire.** Data for this study derive from student responses to a questionnaire that is an adapted version of the Theories About Schooling survey (Nicholls, et al., 1985; Nicholls, 1989), composed of scales assessing Motivational Orientations, Theories about the Purposes of Schooling, and Strategies for School Success. The questionnaire contained a total of 89 items. The motivational orientations scales (MOS) were selected for analyses in the present study. Participating students indicated their level of agreement with each statement by responding on a 5-point Likert-type scale (strongly agree to strongly disagree). To orient agreement with higher scores, this scale was reversed for all analyses.

**Motivational Orientations Scales.** The motivational orientations scales include items intended to measure students' *Task*, *Ego*, and *Work Avoidance/Academic Alienation Orientations*. The stem for each item involved the question "When do you feel you have had a really successful day in school?", followed by the prompt "I feel most successful if...". The full set of 33 items is listed in the Appendix. Example items from each scale include:

*Task Orientation.* "Something I learn really makes sense to me." "I spend my time at school doing school-related work."

*Ego Orientation.* "I show people I'm smart." "I do the work better than other students."

*Work Avoidance/Academic Alienation.* "All the work is easy." "I do almost no work and get away with it."

**Educational aspirations and expectations.** Students also responded to questions meant to assess their aspirations and expectations for level of academic attainment, each based on a one-through-eight scale ranging from (1) some high school, to (5) associate or two-year degree, (6) bachelor's or four-year degree, to (8) graduate or professional degree (Ph.D., J.D., etc.). Higher education aspirations were measured with the prompt, "If you could do exactly what you wanted, how far would you go in school?," and higher education expectations were measured with the prompt, "If you were to guess, how far do you think you will go in school?"

**Demographic information.** The demographic information section of the student self-response survey contained questions found in related studies involving Latino and Mexican origin students (Gándara, et al., 2004; Gonzalez & Padilla, 1997; Suárez-Orozco & Suárez-Orozco, 1995) including age, gender, grade level (9-12), country of birth, length of time living in the United States, frequency of change of residence, generational status (immigrant/1<sup>st</sup> generation, 2<sup>nd</sup> generation, mixed generation, 3<sup>rd</sup> generation-plus), immigration status (U.S.-born,

immigrated before 12 years of age, immigrated after 12 years of age), family income level, Spanish and English language proficiencies, mother's and father's level of education attainment, most recent grades in academic content areas (Science, Math, English, Physical Education, Second/Foreign Language, and History/Social Studies), and participation in a college-preparation ("pipeline") program. Participants were also asked to indicate the ethnic categories with which they most identify<sup>3</sup>. In this study, ethnic categories in the questionnaire included: Mexican/Mexicano; Mexican American; Chicano; Central or South American; Asian/Asian American; Black/African American; Native American or Alaskan/American Indian; Puerto Rican; Cuban; White/Caucasian.

**Back-translation.** All scale items and demographic questions were composed or adapted from prior questionnaires in English, and then translated into Spanish through a back-translation procedure. For this procedure, translator number 1, a female, native Spanish speaking university student of Mexican descent, translated the English-worded items into Spanish. Next, translator number 2, a male, English/Spanish fluent university student, translated the Spanish items back into English. Both of these university students had attended different rural high schools in the geographic region of Eastern Washington State of the student participants in the study. After the back translation process, the author, who is also English/Spanish bilingual, reviewed the translations with both translators to check for consistency of meaning across all items. All students participating in the study were given the option of completing an English or a Spanish version of the questionnaire.

### **Data Analysis**

**Study sample.** Of the total of 421 students who completed some portion of the questionnaire, analyses were conducted using responses from those students who self-identified,

in response to the ethnic identification question on the survey, as Mexican, Chicano, or Mexican-American ( $n = 354$ ).

**Exploratory first-order factor analysis.** Exploratory factor analyses (EFA) was conducted to assess the theoretical structure of the motivational orientations scales. A random split-samples EFA was conducted with one half ( $n = 177$ ) of the cases, randomly selected from the sample of 354, to identify and reduce the number of items to form the initial latent factors. The EFA was conducted using principal axis extraction<sup>1</sup>, with an oblique (Promax) rotation to allow for the latent factors to be correlated (Pett, Lackey, & Sullivan, 2003).

**Confirmatory factor analyses (CFA) on language of survey response.** The first-order factors identified in the EFA were used as the basis for a CFA, using the remaining split-half sample ( $n = 177$ ). The objective here was to confirm that the factor structure from the first split-half results could be confirmed using the second split-half sample. The first-order factor structure was to be considered valid if fit indices, produced by EQS 6.1, met adequate criteria (see list of goodness-of-fit criteria below). If so validated, then language-based CFA would be conducted by following a hierarchical process of increasingly stringent tests of model-to-data fit (Byrne, 2006).

**Language invariance testing.** Valid findings from the split-sample CFA would suggest the appropriateness of conducting multiple-group confirmatory factor analyses (CFA), using EQS 6.1. This involved the creation of baseline models for each subgroup (English versus Spanish response sets), followed by the construction of a multiple-group model, in which factor loadings and factor variances, with the exception of one reference variable per factor (constrained to 1.0) were allowed to vary freely. Robust measurement estimations were used in

---

<sup>1</sup> Garson (2009) suggests use of principal axis extraction, warning that results of principal components analysis (PCA) may predispose the latent factors toward a near-acceptable model-to-data fit, while still leaving a fair amount of noise in the model, increasing the need to allow multiple error terms to covary to achieve good fit indices, and thereby producing a less parsimonious resulting model.

modeling the data. Inter-factor cross loadings were included in the models, along with covarying of error terms, as indicated by Lagrangian Multiplier (LM) test output, a procedure which Byrne (2006) suggests is appropriate when assessing model fit.

Following the testing of the language-based multiple-groups models, I tested constraints models for statistically significant differences in the sizes of the model parameters across language groups. I placed constraints on the factor loadings and covariances, again with the exception of one reference variable per factor, and excluding cross-loadings and error covariances that may be shared between the models under examination, and assessed the results according to multiple goodness-of-fit criteria.

**Measuring model goodness-of-fit.** The measurement goodness-of-fit of the structural models was evaluated with three statistics: Comparative Fit Index (CFI), Root Mean-Square Error of Approximation (RMSEA), and the model chi-square/degrees of freedom statistic ( $\chi^2$ ). Criteria for good model-to-data fit vary between researchers. For the purposes of this study, Comparative Fit Index (CFI) values over .90 and RMSEA values under .05 are used to indicate good model-to-data fit (Byrne, 2006). LaGrange Multiplier (LM) tests were used to locate error terms to be covaried and equality constraints that may contribute to degradation of model fit. Although the change in chi-square statistic ( $\Delta\chi^2$ ) is often used to demonstrate invariance of models, Byrne (2006) warns that this test's sensitivity to sample size and nonnormality makes it "an impractical and unrealistic criterion on which to base evidence of invariance" (p. 247). Therefore, the present analysis followed Byrne's suggestion of using two criteria for the evaluative process for determining evidence of model invariance: (a) a good fit to the data exhibited by the multigroup model, and (b) that the difference between measurement and structural models, indicated by  $\Delta$ CFI, is negligible. Opinions vary among researchers as to the

degree by which the models may differ in  $\Delta CFI$ , ranging from .01 to .05 (Byrne, 2006). For this study, I employed the criterion of .01 for indication of model invariance.

**Second-order latent factor model construction.** Next, I conducted a CFA on a 3-factor measurement model, based on theoretical characteristics of the Approach- and Avoidance-based latent factors of Nicholls' motivational orientations items (Nicholls, Patashnick, & Nolen, 1985; Nicholls, 1989). Specifically, this 3-factor measurement model included the following latent variables: Task and Work Hard Orientations composed an "Academic Approach Orientation" latent factor; Work Avoidance and Academic Alienation Orientations composed an "Avoidance Orientation" latent factor; and Educational Aspirations and Expectations composed a third latent factor (as depicted in Figure 1). As an initial test, I constructed the model with Ego Approach Orientation loading onto the Academic Approach Orientation latent factor. I used the entire student sample, with listwise deletion of missing data, and removal of one case shown to be an extreme outlier on multiple motivational orientation items ( $n = 336$ ).

Using the latent factor structure resulting from the 3-factor measurement model factor analysis with the full-sample, I constructed four multiple-group structural models and tested the fit of these multiple groups models. These multiple-group CFA involved both groups in each model comprising each subgroup of students, as identified in the research questions:

- A) male versus female
- B) grade level (9<sup>th</sup> and 10<sup>th</sup> versus 11<sup>th</sup> and 12<sup>th</sup>)
- C) Mexico-born versus US-born
- D) school composition (Latino majority vs. Latino minority).

Figure 1 offers a visual representation of these student subgroup pairings.

**Correlations among outcome variables.** Assuming establishment of factor invariance between language and nativity subsamples, an inter-factor correlation analysis was conducted on scales produced through the CFA process, including means, standard deviations, Cronbach alphas, and Pearson Product-Moment correlations.

**Structural equation models (path analyses).** Next, I conducted path analyses to assess the relationships between 1) the first- and second-order latent factors of students' motivational orientations, and 2) those second-order Academic Approach and Academic Avoidance factors and students' higher-education orientations (the first-order latent factor of higher education aspirations and higher education expectations). The parameters of the research model (Figure 1) were assessed for the four subgroups of students. Figure 1 contains graphical interpretations of the path model, including proposed relationships between subgroups of students. After estimating the parameters for the model for each group, tests of invariance were conducted between the student subgroups-based models, to assess change in parameter values with each successive set of constraints imposed on the model. Model invariance was assessed using the same goodness-of-fit criteria listed above.

Of most theoretical interest were the paths between the latent factors of Academic Approach and Higher Education Orientation (Path 10), the path between Academic Avoidance and Higher Education Orientation (Path 11), and the covariance between Academic Approach and Academic Avoidance Orientations (Path 9).

**Tests for mean differences across sample subgroups.** Multivariate analyses of variance (MANOVA) were conducted to test for significant mean differences and interaction effects on higher education aspirations and higher education expectations, between the subgroups of students based on gender, nativity, grade level, and school ethnic composition. Because of

limitations of sample size, the tests involved only two sets of student subgroups, for a total of six 2X2 MANOVA. Output from SPSS 19 was used to test adherence to the assumptions of normality (scatterplots and boxplots), and linearity (bivariate scatterplots). Box's test was used to assess homogeneity of covariance matrices (homoscedasticity). If Box's test was found to be significant, Pillai's Trace was interpreted, rather than Wilks' Lambda (Mertler & Vannatta, 2005; Tabachnick & Fidell, 1996).

**CHAPTER IV: RESULTS****Results**

Figure 1 is useful for interpretation of the following results, but in particular for the Path Model results. It is constructed to follow the structural equation modeling conventions of Bentler (2006). In Figure 1, rectangles represent measured variables, ovals represent latent factors, paths with double-headed arrows represent non-directional covariances, single-headed arrows represent directional effects, E represents measurement uniqueness, and D represents structural residuals (see Abbott & Berninger, 1993, for a similar representation).

**EFA/CFA random split-half reliability test.**

EFA results, based on the first split-half sample, with listwise deletion of missing responses ( $n = 167$ ), revealed 16 items that comprised five latent factors. Communalities were of moderate to high values, with the exception of Item 11, which had a low extraction value of .27. Assessment of scree plot showed two main factors, and these two factors accounted for 50.9% of the total variance, with the remaining three factors accounted for an additional 20.8% of total variance. A review of item content led me to interpret these factors as representing the motivational orientations of *Learning* (3 items), *Work Hard* (4 items), *Ego Approach* (3 items), *Work Avoidance* (3 items), and *Academic Alienation* (3 items). Items composing latent factors can be seen in Table 1.

Table 1. Factor Analysis Results on Random Split-Half Sample (Promax Rotation):  
Motivational Orientation Items ( $n = 167$ )

Item:	Factor 1:	Factor 2:	Factor 3:	Factor 4:	Factor 5:	$\alpha$
	Work Avoidance Orientation	Ego Orientation	Work Hard Orientation	Alienation Orientation	Task/Learning Orientation	
I feel most successful if...						
24 all the work is easy.	<b>.90</b>			.57		<b>.66</b>
25 I don't have any tough tests.	<b>.87</b>			.51		
23 the teacher doesn't ask any hard questions.	<b>.76</b>			.47		
15 I show people I'm smart.		<b>.95</b>			.41	<b>.77</b>
14 I show people I'm good at something.		<b>.82</b>				
12 I do the work better than other students.		<b>.72</b>			.54	
9 I work hard all day.			<b>.80</b>		.45	<b>.84</b>
10 I spend my time at school doing school-related work.		.41	<b>.71</b>		.55	
8 I keep busy.		.45	<b>.64</b>			
11 I don't waste my time at school goofing around.			<b>.48</b>			
29 I fool around and get away with it.	.52			<b>.90</b>		<b>.85</b>
28 I put one over on (I trick) the teacher.	.51			<b>.79</b>		
27 I do almost no work and get away with it.	.54			<b>.69</b>		
3 I learn something interesting.					<b>.68</b>	<b>.83</b>
2 I get a new idea about how things work.					<b>.66</b>	
6 I finally understand a really complicated idea.			.43		<b>.66</b>	

Note. Only factor loadings greater than .40 are presented.

Next, I analyzed a measurement model, based on the EFA-based model, using the second random, split-half sample. Based on Lagrange Multiplier (LM) output, one pair of error terms (item 6: Task/Learning Orientation; item 12: Ego Orientation) was allowed to covary. Results showed good model fit to the data (CFI = .954, RMSEA = .06). The resulting factor loadings for the split-half CFA-based model are shown in Figure 2.

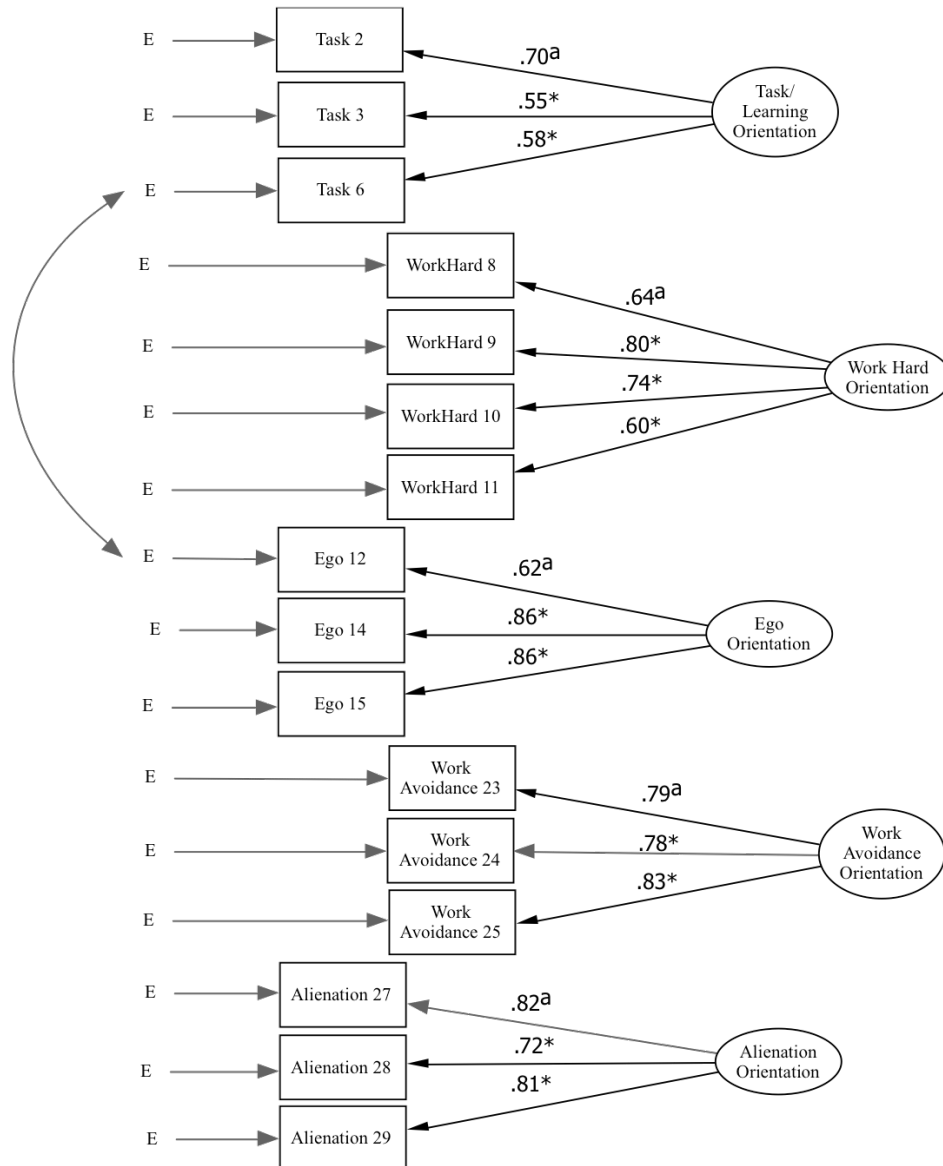


Figure 2. Factor loadings from Split-half CFA ( $n = 174$ ). <sup>a</sup> = reference item, significance not estimated.

**Multiple-groups invariance test for language.** The language-based multiple-groups CFA was used to assess metric invariance of factor loadings between the English and Spanish versions of the survey. Lagrange Multiplier (LM) output suggested the Learning/Ego Orientation crossload for Item 12 only for the English language data sample. Baseline models fit the data well for both English responses ( $n = 285$ , CFI = .957, RMSEA = .06), and, with two error terms

covaried (Ego-to-Learning and Ego-to-Work Hard Orientation Items) for the Spanish response set ( $n = 87$ , CFI = .955, RMSEA = .06). When the baseline models were combined into a multiple-group model, this model fit the data well ( $\chi^2(185) = 280.25$ , CFI = .957, RMSEA = .06). Constraints were placed on the factor loadings between language groups, with the exception of the Item 12 crossload for the English response sample. LM output suggested the removal of two constraints, Items 3 from the Learning Orientation item set, and Item 10 from the Work Hard Orientation item set. I removed these two item-factor constraints to impose a partial measurement invariance procedure on the model (Byrne, 2006). The partial invariance constraints model fit the data well ( $\chi^2(193) = 295.51$ , CFI = .953, RMSEA = .06). The  $\chi^2$  difference test between multiple-group and constraints models was nonsignificant ( $\Delta\chi^2(8) = 15.26$ ,  $p > .05$ ), and assessment of the change in CFI showed very little difference between models ( $\Delta\text{CFI} = .004$ ). The resulting factor loadings for the language-based CFA model are shown in Figure 3.

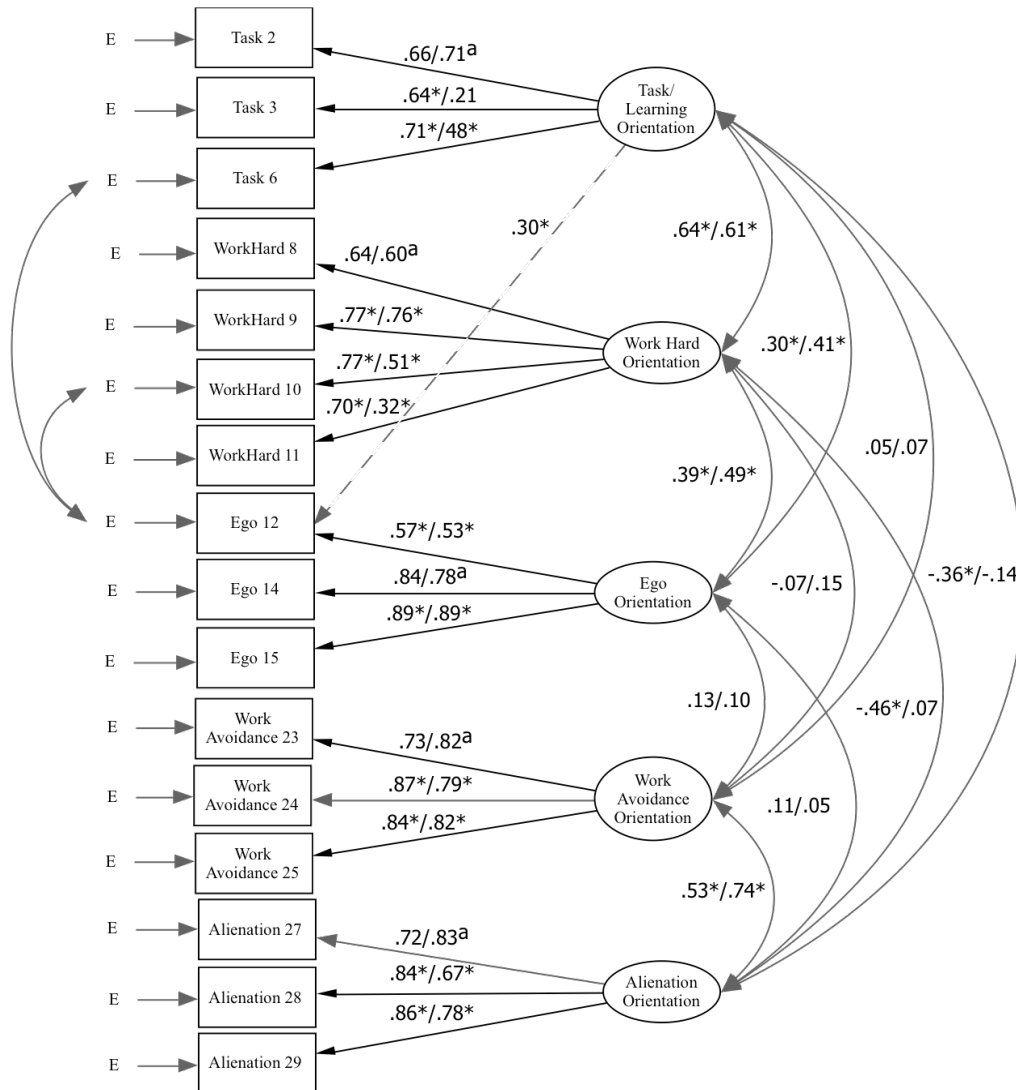


Figure 3. Item-factor loadings and inter-factor correlations on CFA for language (English,  $n = 258$  / Spanish,  $n = 87$ ) response groups. Dashed line = English language response group.

<sup>a</sup> = reference item, significance not available.

\* =  $p < .05$ .

**Creation of Motivational Orientations scale scores.** Items associated with each latent motivational orientation factor resulting from the EFA and CFA validation procedures (Learning, Work Hard, Ego Approach, Work Avoidance, and Academic Alienation) were averaged to create scale scores. Scales scores were also created for each pair of subgroups of students, based on gender, grade level, nativity, and school ethnic composition. Scale scores were used, as opposed

to factor scores, to enhance interpretability of findings in further multivariate tests using the scales.

**Correlational Analyses.** Correlational analyses were conducted using the measured variables for each pair of subgroups of students based on gender, grade level, nativity, and school ethnic composition (Tables 2 through 5). Results showed that the measured variables relate to one another in the predicted patterns between motivational orientations and college aspirations and expectations, with some exceptions. Specifically, significantly positive relationships were shown between Learning Orientation and Educational Aspirations and Expectations, and between Work Avoidance and Alienation for all subgroups, with the exception that the positive relationship between Learning Orientation and Education Aspirations and Expectations was not significant for students in the Latino minority school. Work Hard Orientation was non-significant or weakly positively related to Education Aspirations and Expectations for students who were male, in grades 11 and 12, US-born, or attending a Latino minority school. Work Hard Orientation was significantly positively related to Education Aspiration and Expectations for girls, students in grades 9 and 10, students born in Mexico, and students in the Latino majority schools. Ego Orientation was significantly and positively related to Work Avoidance for students who were female, Mexico-born, and who attended the Latino minority school.

Table 2. Means, Standard Deviations, and Correlations for Independent Variables by Gender  
(Girls,  $n = 160$ ; Boys,  $n = 144$ )

Measure	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1 Education Aspirations	—	.67**	.29**	.13	.17*	.03	-.14	6.31 (5.98)	1.66 (1.91)
2 Education Expectations	.55**	—	.33**	.12	.23**	.10	.01	5.28 (4.98)	1.86 (2.10)
3 Learning	.21**	.17*	—	.38**	.38**	-.02	-.25**	4.40 (4.16)	0.51 (0.57)
4 Work Hard	.20*	.16*	.43**	—	.36**	.05	-.25**	3.64 (3.38)	0.82 (0.76)
5 Ego	.12	.21**	.38**	.45**	—	.05	.03	3.68 (3.77)	0.99 (0.77)
6 Work Avoidance	.02	.05	.12	.03	.27**	—	.50**	2.87 (2.96)	1.11 (1.02)
7 Alienation	-.08	-.09	.03	-.09	.19*	.57**	—	2.23 (2.59)	0.94 (0.97)

Note. Correlations for girls are reported below the diagonal. Means and standard deviations for boys are reported in parentheses.

\* $p < .05$ , \*\* $p < .01$ .

Table 3. Means, Standard Deviations, and Correlations for Independent Variables by Grade Level (9th-10th,  $n = 209$ ; 11th-12th,  $n = 137$ )

Measure	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1 Education Aspirations	—	.62**	.20*	.14	.03	-.07	-.19*	6.19 (6.11)	1.86 (1.74)
2 Education Expectations	.62**	—	.21*	.08	.13	.03	-.11	5.10 (5.17)	2.09 (1.80)
3 Learning	.29**	.32**	—	.41**	.28**	-.09	-.34**	4.25 (4.32)	0.59 (0.52)
4 Work Hard	.24**	.22**	.45**	—	.30**	-.12	-.28**	3.53 (3.52)	0.79 (0.80)
5 Ego	.19**	.25**	.37**	.44**	—	.17*	.13	3.66 (3.78)	0.96 (0.79)
6 Work Avoidance	.05	.09	.11	.11	.20**	—	.60**	2.91 (2.91)	1.08 (1.04)
7 Alienation	-.10	-.01	-.03	-.14*	.14*	.53**	—	2.32 (2.46)	0.95 (1.00)

Note. Correlations for 9th-10th grade students are reported below the diagonal. Means and standard deviations for 11th-12th grade students are reported in parentheses.

\* $p < .05$ , \*\* $p < .01$ .

Table 4. Means, Standard Deviations, and Correlations for Independent Variables by Nativity  
(Mexico-born,  $n = 127$ ; US-born,  $n=219$ )

Measure	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1 Education Aspirations	—	.59**	.21**	.15*	.10	-.02	-.18**	6.06 (6.22)	1.94 (1.73)
2 Education Expectations	.63**	—	.24**	.13	.18**	.03	-.08	5.01 (5.17)	2.21 (1.83)
3 Learning	.28**	.37**	—	.40**	.34**	.06	-.10	4.28 (4.26)	0.59 (0.57)
4 Work Hard	.29**	.26**	.49**	—	.39**	-.01	-.29**	3.63 (3.45)	0.82 (0.78)
5 Ego	.21*	.29**	.34**	.35**	—	.18**	.09	3.89 (3.60)	0.82 (0.93)
6 Work Avoidance	.01	.12	.06	.10	.24**	—	.50**	2.86 (2.93)	1.09 (1.06)
7 Alienation	-.06	-.03	-.27**	-.08	.23**	.59**	—	2.41 (2.37)	1.04 (0.95)

Note. Correlations for Mexico-born students are reported below the diagonal. Means and standard deviations for US-born students are reported in parentheses.

\* $p < .05$ , \*\* $p < .01$ .

Table 5. Means, Standard Deviations, and Correlations for Independent Variables by School Composition (Latino majority,  $n = 270$ ; Latino minority,  $n = 76$ )

Measure	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1 Education Aspirations	—	.68**	.18	.22	.04	.05	-.11	6.27 (5.75)	1.80 (1.79)
2 Education Expectations	.61**	—	.18	.18	.20	.12	.02	5.15 (5.07)	2.02 (1.83)
3 Learning	.30**	.32**	—	.36**	.27*	.06	-.06	4.25 (4.37)	0.56 (0.59)
4 Work Hard	.21**	.17**	.45**	—	.32**	.17	-.15	3.51 (3.58)	0.81 (0.74)
5 Ego Approach	.16**	.21**	.37**	.40**	—	.43**	.28*	3.69 (3.76)	0.91 (0.88)
6 Work Avoidance	.01	.06	.02	-.02	.13*	—	.53**	2.83 (3.22)	1.08 (0.95)
7 Alienation	-.14*	-.06	-.17**	-.21**	.10	.46**	—	2.34 (2.51)	0.98 (0.93)

Note. Correlations for Latino majority students are reported below the diagonal. Means and standard deviations for Latino minority students are reported in parentheses.

\* $p < .05$ , \*\* $p < .01$ .

**Validation of the 3-factor latent variable measurement model.** Results of the full-sample CFA showed that the three-factor model, which tested for congeneric invariance of the measured variables, composed of second-order motivational orientations latent factors, and a first-order latent factor composed of higher education aspirations and expectations items, with the Ego Orientation scale loading onto the academic approach factor, did not fit the data well (CFI = .765, RMSEA = .18). Per Lagrangian Multiplier [LM] test results (Bentler, 2006), I specified the model with Ego Orientation cross-loading between the approach and avoidance second-order factors. Model fit indices for this full-sample measurement model CFA showed acceptable model-to-data fit (CFI = .951, RMSEA = .08).

Multiple-group CFA for gender fit the data well (CFI=.977, RMSEA=.06), as did the

constraints model (CFI=.968, RMSEA=.06), and the models did not differ significantly ( $\Delta\chi^2(5) = 8.83, p > .05$ ). Multiple-group CFA for grade level fit the data well (CFI=.978, RMSEA=.06), as did the constraints model (CFI=.969, RMSEA=.06), and the models did not differ significantly ( $\Delta\chi^2(5) = 2.59, p > .05$ ). Multiple-group CFA for birth country fit the data well (CFI=.973, RMSEA=.06), as did the constraints model (CFI=.969, RMSEA=.06), and the models did not differ significantly ( $\Delta\chi^2(5) = 7.11, p > .05$ ). Multiple-group CFA for school ethnic composition fit the data well (CFI=.976, RMSEA=.06), as did the constraints model (CFI=.974, RMSEA=.06), and the models did not differ significantly ( $\Delta\chi^2(5) = 5.72, p > .05$ ).

**Structural equation model (path analysis).** The numbered paths and covariances in Figure 1 correspond to the path numbers and values in Tables 7 through 10. The path model was fit to the covariance matrices for each subgroup pair of participant responses. Standardized path values and associated z statistics are shown in Tables 7 through 10. In the tables, z values of 2.0 or greater are statistically significant ( $p < .05$ ) (Bentler, 2006).

Fit indices showed that the initial three-factor latent models for each subgroup, with the Ego Orientation crossload included in the models, fit the data well, with CFI values for all subgroups greater than .97, and all RMSEA at or below .06 (see Table 6).

Based on the fit statistics and model parsimony, the initial model fit the data best for all subgroups of students, with the exception of the nativity sample, for which Model 2, with Paths 9 and 11 constrained, and Path 10 estimated (see Figure 1), showed better goodness of fit to the data. The patterns of parameter relationships and model fit statistics for each subgroup pair modeled are reviewed separately below.

Table 6. Fit Indices for path models compared across subgroups of students

Group	Model	$\chi^2$	<i>df</i>	$\chi^2/df$ <i>ratio</i>	$\Delta\chi^2$	CFI	RMSEA	$\Delta$ CFI
Gender	Initial	29.80	20	1.49		.977	.057	
	Model 1	36.10	22	1.64	6.30*	.967	.065	.01
	Model 2	36.83	22	1.67	7.03*	.965	.067	.01
	Model 3	37.36	23	1.62	7.56	.966	.064	.01
Grade Level	Initial	31.36	20	1.57		.978	.057	
	Model 1	39.89	22	1.81	8.53*	.965	.069	.01
	Model 2	38.82	22	1.76	7.46*	.967	.067	.01
	Model 3	40.22	23	1.75	8.86*	.967	.066	.01
Nativity	Initial	33.71	20	1.69		.973	.063	
	Model 1	38.09	22	1.73	4.38	.969	.065	.00
	Model 2	36.15	22	1.64	2.44	.972	.061	.00
	Model 3	39.13	23	1.70	5.42	.968	.064	.01
School Composition	Initial	32.42	20	1.62		.976	.060	
	Model 1	35.81	22	1.63	3.39	.973	.060	.00
	Model 2	35.79	22	1.63	3.37	.973	.060	.00
	Model 3	36.06	23	1.57	3.64	.974	.057	.00

Note. Model 1: Approach and College-going Orientations Estimated; Model 2: Avoidance and College-going Orientations Estimated; Model 3: Approach, Avoidance, and College-going Orientations Constrained. Gender: Girls,  $n = 160$ ; Boys,  $n=144$ ; Grade Level: 9th-10th,  $n = 209$ ; 11th-12th,  $n = 137$ ; Nativity: Mexico-born,  $n = 127$ ; US-born,  $n = 219$ ; School Composition: Latino Majority,  $n = 270$ ; Latino Minority,  $n = 76$ .

CFI = comparative fit index; RMSEA = root mean square error of approximation.

\*  $p < .05$ . \*\*  $p < .01$ .

**Gender sample.** For male and female samples, loadings on paths between latent factors (circles) and measured variables (rectangles) were all positive and significant, suggesting that each measured variable is a good indicator of its corresponding latent factor. Of note, however, the loadings for both genders on Path 4, Ego Orientation to Academic Avoidance, are lower relative to all other loadings. The positive and significant loadings for path 10 and nonsignificant loadings for path 11 occurred as expected in both gender-based response groups. However, whereas the female sample showed a nonsignificant relationship on Path 9, that is, there was no correlation between the latent factors of Academic Approach and Academic Avoidance Orientations, male students showed a significant and negative correlation between these factors.

Of theoretical interest are the paths between the latent factors of Academic Approach and College-Going Orientation (Path 10), and the path between Academic Avoidance and College-Going Orientation (Path 11). To test the hypothesis that Paths 10 and 11 are similar for female and male students, multiple-group structural equation modeling (Bentler, 2006) was used to fit three constraints models for each gender. In Model 1, Path 9, the covariance between Academic Approach and Academic Avoidance Orientations (Path 9), and the value of Path 11 were constrained to be equal across genders. In Model 2, Path 9 was constrained to be equal across genders, as well as the value of Path 10. In Model 3, Paths 9, 10, and 11 were all constrained to be equal across genders. The initial model, with no constraints, fit the data well (CFI = .977, RMSEA = .057). Whereas change in chi-square values showed that both model 1 and model 2 were significantly different from the initial model ( $\Delta\chi^2(2) = 6.30, p < .05$ ;  $\Delta\chi^2(2) = 7.03, p < .05$ , respectively), Model 3 was not significantly different from the initial model ( $\Delta\chi^2(3) = 7.56, p > .05$ ).

Lagrangian Multiplier [LM] tests (Bentler, 2006) were used to examine the effect of each

equality constraint for each constraints model. When constraints were imposed, the nonsignificant covariance on Path 9 for female students became significant and negative, across all constraints models. According to the LM tests, however, none of the individual constraints was significant for any constraints model: the path from Academic Approach to College-going Orientation (Path 10) is statistically and positively significant across genders in all models, and the path from Academic Avoidance to College-going Orientations (Path 11) does not load statistically significantly across genders in any of the models. Interestingly, though, the value of Path 4 (between Ego Orientation and the Academic Avoidance latent variable) increased for girls and decreased for boys with each constraint added to the initial model.

Table 7. Values of standardized parameter estimates, test statistics ( $z$ ), and goodness of fit for latent variable model relating motivational orientations, academic orientations, college aspirations and expectations, and college-going orientation for female ( $n = 160$ ) and male ( $n = 144$ ) students

Path	Initial Model		Constraints Model 1		Constraints Model 2		Constraints Model 3	
	Female	Male	Female	Male	Female	Male	Female	Male
1	.59 (6.6)	.70 (7.3)	.58 (6.6)	.70 (7.1)	.58 (6.5)	.71 (7.2)	.58 (6.6)	.70 (7.1)
2	.73 (7.9)	.60 (6.1)	.74 (8.2)	.56 (5.9)	.74 (8.1)	.56 (5.9)	.74 (8.2)	.57 (5.9)
3	.62 (7.1)	.68 (5.6)	.67 (7.2)	.63 (6.1)	.67 (7.1)	.63 (6.1)	.67 (7.2)	.63 (6.1)
4	.29 (3.5)	.29 (2.4)	.34 (3.9)	.22 (2.3)	.35 (4.0)	.22 (2.2)	.36 (4.1)	.22 (2.2)
5	.76 (6.2)	.50 (4.0)	.68 (6.1)	.50 (3.4)	.70 (6.3)	.50 (3.2)	.70 (6.3)	.50 (3.2)
6	.75 (6.2)	1.0 (4.9)	.85 (6.8)	1.0 (3.8)	.82 (6.7)	1.0 (3.6)	.82 (6.8)	1.0 (3.6)
7	.74 <sup>a</sup> (--)	.73 <sup>a</sup> (--)	.76 <sup>a</sup> (--)	.68 <sup>a</sup> (--)	.74 <sup>a</sup> (--)	.77 <sup>a</sup> (--)	.77 <sup>a</sup> (--)	.73 <sup>a</sup> (--)
8	.73 (3.0)	.92 (4.0)	.72 (3.6)	.98 (4.2)	.74 (3.0)	.87 (4.2)	.72 (3.5)	.91 (4.1)
9	.02 (0.2)	-.39 (3.1)	-.22 (2.7)	-.22 (2.7)	-.21 (2.6)	-.21 (2.6)	-.22 (2.6)	-.22 (2.6)
10	.37 (2.9)	.47 (3.1)	.40 (4.2)	.40 (4.2)	.37 (3.0)	.43 (3.4)	.41 (4.3)	.39 (4.3)
11	-.05 (0.4)	.16 (1.4)	-.04 (0.4)	.13 (1.4)	.03 (0.4)	.03 (0.4)	.04 (0.6)	.04 (0.6)

Note. Parameters constrained and estimated for latent structural paths: Initial Model, all relationships estimated; Model 1: F1→ F2 and F2→ F3 constrained, F1→ F3 estimated; Model 2: F1→ F3 and F2→ F3 constrained, F1→ F2 estimated; Model 3: F1→ F2, F1→ F3, and F2→ F3 constrained.

Dashes indicate not estimable. <sup>a</sup> Fixed to scale the latent endogenous variable.

**Grade level sample.** For the initial multiple-groups model for 9th-10th versus 11th-12th grade-level samples, loadings on paths between latent factors and measured variables were all positive and significant, suggesting that each measured variable is a good indicator of its corresponding latent factor. As with the gender-based model, the loadings for both grade-level groups on Path 4, Ego Orientation to Academic Avoidance, are significant yet lower relative to all other loadings. The positive loadings for path 10 and nonsignificant relationship on path 11 occurred for both 9th-10th and 11th-12th grade samples, although Path 10 did not reach significance for the 11th-12th grade sample. However, whereas the 9th-10th grade sample evidenced a negative but nonsignificant relationship on Path 9, 11th-12th grade students showed a significantly negative value on this path.

The initial model, with no constraints, fit the data well (CFI = .978, RMSEA = .057). To test the hypothesis that Paths 10 and 11 are similar for lower and upper grade level students, multiple-group structural equation constraints models, of the same patterns of constraints as for gender-based models, were imposed on the initial grade-level model. Lagrangian Multiplier [LM] tests (Bentler, 2006) were used to examine the effect of each equality constraint for each model with constraints. When constraints were imposed, the nonsignificant covariance on Path 9 for female students became significant and negative, and the value on Path 10 became significant and positive for both grade levels across all constraints models. Change in chi-square values showed that models 1, 2, and 3 were significantly different from the initial model ( $\Delta\chi^2(2) = 8.53, p < .05$ ;  $\Delta\chi^2(2) = 7.46, p < .05$ ;  $\Delta\chi^2(3) = 8.86, p < .05$ ).

Analysis of constraints imposed in each model using LM tests indicated that constraining path 9 to be equal in 9th-10th and 11th-12th grade samples significantly decreased model fit, and was the locus of difference between all three constrained models and the initial unconstrained model. As in the gender models, the value of Path 4 (between Ego Orientation and the Academic Avoidance latent variable) increased for 9th-10th grade and decreased for 11th-12th grade with each constraint added, relative to the initial model.

Table 8. Values of standardized parameter estimates, test statistics ( $z$ ), and goodness of fit for latent variable model relating motivational orientations, academic orientations, college aspirations and expectations, and college-going orientation for 9th-10th Grade ( $n = 209$ ) and 11th-12th ( $n = 137$ ) Grade students

Path	Initial Model		Constraints Model 1		Constraints Model 2		Constraints Model 3	
	9th-10th	11th-12th	9th-10th	11th-12th	9th-10th	11th-12th	9th-10th	11th-12th
1	.64 (8.4)	.67 (6.9)	.62 (8.2)	.69 (6.8)	.63 (8.4)	.68 (6.6)	.62 (8.2)	.69 (6.8)
2	.71 (9.3)	.61 (6.4)	.72 (9.4)	.61 (6.2)	.72 (9.5)	.61 (6.1)	.72 (9.4)	.61 (6.2)
3	.63 (8.0)	.66 (4.5)	.65 (7.7)	.58 (5.4)	.65 (7.7)	.59 (5.3)	.65 (7.7)	.58 (5.4)
4	.23 (2.7)	.45 (3.2)	.27 (3.3)	.35 (3.6)	.26 (3.2)	.40 (3.6)	.27 (3.3)	.36 (3.6)
5	.53 (4.0)	.60 (6.0)	.53 (5.0)	.60 (5.3)	.53 (5.1)	.60 (5.3)	.53 (5.0)	.60 (5.3)
6	1.0 (4.5)	1.0 (8.2)	1.0 (5.9)	1.0 (6.6)	1.0 (6.0)	1.0 (6.5)	1.0 (5.9)	1.0 (6.5)
7	.77 <sup>a</sup> (--)	.85 <sup>a</sup> (--)	.73 <sup>a</sup> (--)	.86 <sup>a</sup> (--)	.78 <sup>a</sup> (--)	.80 <sup>a</sup> (--)	.75 <sup>a</sup> (--)	.84 <sup>a</sup> (--)
8	.81 (5.3)	.72 (2.8)	.84 (4.8)	.73 (3.5)	.79 (5.4)	.77 (2.7)	.82 (5.0)	.74 (3.5)
9	-.14 (1.5)	-.48 (4.4)	-.27 (3.8)	-.27 (3.8)	-.27 (3.7)	-.27 (3.7)	-.27 (3.8)	-.27 (3.8)
10	.48 (4.6)	.27 (1.9)	.43 (4.8)	.38 (4.8)	.48 (4.7)	.31 (2.3)	.43 (5.0)	.40 (5.0)
11	-.00 (0.0)	-.08 (0.6)	.03 (0.3)	-.05 (0.5)	-.02 (0.3)	-.02 (0.3)	-.00 (0.0)	-.00 (0.0)

Note. Parameters constrained and estimated for latent structural paths: Initial Model, all relationships estimated; Model 1: F1→F2 and F2→F3 constrained, F1→F3 estimated; Model 2: F1→F3 and F2→F3 constrained, F1→F2 estimated; Model 3: F1→F2, F1→F3, and F2→F3 constrained.

Dashes indicate not estimable. <sup>a</sup> Fixed to scale the latent endogenous variable.

**Nativity sample.** For the initial models of Mexico-born and US-born samples, loadings on paths between latent factors and measured variables were all positive and significant, suggesting that each measured variable is a good indicator of its corresponding latent factor. As with the gender and grade-levels initial models, the loadings for both genders on Path 4 are lower relative to all other loadings. The positive loadings for path 10 and nonsignificant loadings for path 11 occurred as expected, and the negative loadings on Path 9 were small but significant for both nativity-based samples,

The initial model, with no constraints, fit the data well (CFI = .973, RMSEA = .063). To test the hypothesis that Paths 10 and 11 are similar for Mexico-born and US-born students, multiple-group structural equation constraints models, of the same patterns of constraints as for

gender-based models, were imposed on the initial nativity model. Lagrangian Multiplier [LM] tests (Bentler, 2006) were used to examine the effect of each equality constraint for each model of constraints. When constraints were imposed, the values on Paths 9, 10, and 11 were not significantly changed, and change in chi-square values evidenced no significant differences between models (see Table 5). Analysis of constraints imposed in each model using LM tests indicated that no constrained paths significantly decreased model fit.

As in the gender and grade level models, there was change in the value of Path 4 (between Ego Orientation and the Academic Avoidance latent variable) as constraints were placed on paths 9, 10, and 11. This time, for the US-born students, there was a decrease, relative to the initial model, in the value of Path 4 with each constraint added. The value did not change for the Mexico-born sample, except for in the last constraints model (Model 3), in which there was also a strong, though non-significant, decrease on the value of Path 10, and a more strongly-negative value on Path 9.

Table 9. Values of standardized parameter estimates, test statistics (*z*), and goodness of fit for latent variable model relating motivational orientations, academic orientations, college aspirations and expectations, and college-going orientation for Mexico-born (*n* = 127) and US-born (*n* = 219) students

Path	Initial Model		Constraints Model 1		Constraints Model 2		Constraints Model 3	
	Mexico-born	US-born	Mexico-born	US-born	Mexico-born	US-born	Mexico-born	US-born
1	.78 (8.1)	.79 (8.1)	.79 (7.9)	.57 (7.5)	.78 (8.2)	.56 (7.3)	.55 (7.3)	.56 (7.5)
2	.62 (6.5)	.61 (6.4)	.60 (6.2)	.71 (9.0)	.62 (6.5)	.71 (8.9)	.72 (9.0)	.70 (9.0)
3	.57 (5.8)	.58 (5.8)	.58 (5.5)	.66 (7.4)	.59 (5.6)	.66 (7.3)	.67 (6.8)	.66 (7.5)
4	.37 (3.7)	.39 (3.7)	.39 (4.0)	.29 (3.5)	.38 (4.0)	.30 (3.5)	.31 (3.2)	.30 (3.5)
5	.65 (5.8)	.66 (7.3)	.65 (6.2)	.50 (5.0)	.66 (6.2)	.50 (4.9)	.50 (5.0)	.50 (4.9)
6	1.0 (7.3)	1.0 (7.9)	1.0 (7.9)	1.0 (6.1)	1.0 (7.9)	1.0 (5.9)	1.0 (6.3)	1.0 (5.9)
7	.79 (--)	.74 (--)	.70 (--)	.82 (--)	.81 (--)	.76 (--)	.80 (--)	.80 (--)
8	.82 (5.1)	.85 (4.2)	.89 (4.2)	.73 (4.6)	.80 (5.1)	.78 (3.6)	.74 (3.7)	.75 (4.6)
9	-.22 (2.1)	-.29 (4.1)	-.29 (4.1)	-.29 (4.1)	-.29 (4.0)	-.29 (4.0)	-.34 (3.5)	-.29 (4.1)
10	.57 (4.4)	.43 (5.0)	.44 (4.9)	.40 (4.9)	.55 (4.4)	.34 (3.2)	.31 (2.9)	.42 (5.0)
11	.08 (0.8)	.00 (0.1)	.09 (0.9)	-.05 (0.6)	-.01 (0.1)	-.01 (0.1)	.08 (0.9)	.00 (0.1)

Note. Parameters constrained and estimated for latent structural paths: Initial Model, all relationships estimated; Model 1: F1→ F2 and F2→ F3 constrained, F1→ F3 estimated; Model 2: F1→ F3 and F2→ F3 constrained, F1→ F2 estimated; Model 3: F1→ F2, F1→ F3, and F2→ F3 constrained.

Dashes indicate not estimable. <sup>a</sup> Fixed to scale the latent endogenous variable.

**School composition sample.** For the initial multiple-groups model for school ethnic composition (Latino-majority versus Latino-minority) samples, loadings on paths between latent factors and measured variables were all positive and significant, suggesting that each measured variable is a good indicator of its corresponding latent factor. As in the previous models, the loadings for both grade-level groups on Path 4, between Ego Orientation to Academic Avoidance, are lower relative to all other loadings. The nonsignificant relationship on path 11 occurred for both school composition samples. Whereas the loadings for path 10 are of moderate magnitude and positive for both school composition groups, the loading is nonsignificant for the Latino-minority school composition group. Furthermore, where the Latino-majority students showed a significantly negative value on Path 9, the Latino-minority sample evidenced a nonsignificant relationship on this path.

The initial model, with no constraints, fit the data well (CFI = .976, RMSEA = .060). To test the hypothesis that the directionality and values of relationships on Paths 10 and 11 hold across school ethnic composition groups, multiple-group structural equation constraints models, of the same patterns of constraints as for the gender-, grade level, and nativity-based models, were imposed on the initial school ethnic composition model. Lagrangian Multiplier [LM] tests (Bentler, 2006) were used to examine the effect of each equality constraint for each model of constraints. Of note, when constraints were placed on the initial model, for each of the constraints models, the value of Path 4, the path representing the positive relationship Ego Orientation to Academic Avoidance Orientation, increased for the Latino-minority sample, but remained relatively unchanged for the Latino-majority sample. When constraints were imposed, the nonsignificant covariance on Path 9 for Latino-minority students became significant and negative, and the value on Path 10 became significant and positive for both school ethnic

composition samples across all constraints models. Change in chi-square values showed that models 1 through 3 were not significantly different from the initial model (see Table 5). Analysis of constraints imposed in each model using LM tests indicated that no constrained paths significantly decreased model fit.

Table 10. Values of standardized parameter estimates, test statistics ( $z$ ), and goodness of fit for latent variable model relating motivational orientations, academic orientations, college aspirations and expectations, and college-going orientation for students in Latino majority ( $n = 270$ ) and Latino minority ( $n = 76$ ) schools

Path	Initial Model		Constraints Model 1		Constraints Model 2		Constraints Model 3	
	Latino majority	Latino minority	Latino majority	Latino minority	Latino majority	Latino minority	Latino majority	Latino minority
1	.68 (10.1)	.57 (3.7)	.68 (10.0)	.56 (3.9)	.68 (10.1)	.56 (3.8)	.68 (10.1)	.56 (3.9)
2	.68 (10.1)	.63 (4.0)	.68 (10.0)	.64 (4.3)	.67 (10.0)	.65 (4.3)	.67 (10.0)	.65 (4.4)
3	.64 (8.4)	.43 (3.2)	.64 (8.6)	.55 (3.8)	.64 (8.6)	.55 (3.8)	.64 (8.6)	.54 (3.8)
4	.29 (3.8)	.44 (3.4)	.28 (3.8)	.56 (4.2)	.28 (3.8)	.55 (4.2)	.28 (3.8)	.55 (4.1)
5	.56 (6.1)	.85 (5.5)	.56 (5.9)	.71 (5.2)	.56 (5.9)	.70 (5.2)	.56 (5.9)	.70 (5.1)
6	.83 (7.3)	.62 (4.5)	1.0 (6.9)	.75 (5.4)	1.0 (6.9)	.76 (5.4)	1.0 (6.9)	.76 (5.4)
7	.78 <sup>a</sup> (--)	.72 <sup>a</sup> (--)	.78 <sup>a</sup> (--)	.79 <sup>a</sup> (--)	.78 <sup>a</sup> (--)	.78 <sup>a</sup> (--)	.77 <sup>a</sup> (--)	.83 <sup>a</sup> (--)
8	.77 (5.6)	.94 (2.3)	.78 (5.4)	.88 (3.3)	.78 (5.6)	.87 (2.4)	.78 (5.5)	.83 (3.2)
9	-.29 (3.5)	.13 (0.7)	-.25 (3.3)	-.25 (3.3)	-.25 (3.3)	-.25 (3.3)	-.25 (3.3)	-.25 (3.3)
10	.46 (4.9)	.33 (1.6)	.44 (5.2)	.43 (5.2)	.46 (5.0)	.35 (1.9)	.45 (5.3)	.41 (5.3)
11	.00 (0.0)	.07 (0.5)	-.01 (0.1)	.09 (0.6)	.01 (0.2)	.01 (0.2)	.00 (0.1)	.00 (0.1)

Note. Parameters constrained and estimated for latent structural paths: Initial Model, all relationships estimated; Model 1: F1→ F2 and F2→ F3 constrained, F1→ F3 estimated; Model 2: F1→ F3 and F2→ F3 constrained, F1→ F2 estimated; Model 3: F1→ F2, F1→ F3, and F2→ F3 constrained.

Dashes indicate not estimable. <sup>a</sup> Fixed to scale the latent endogenous variable.

### MANOVA on Higher Education Aspirations and Expectations

**MANOVA: Gender (2) X nativity (2) X grade (2).** I diverged from my initial MANOVA plan, which involved all four subgroups in one MANOVA. The sample sizes for some compared cells in the proposed 2x2x2x2 MANOVA were too small, with some having less than 5 cases. Also, because the school ethnic composition variable involves students nested within schools, the assumption of independence of observations could not be held. Instead, proper multivariate analysis of this independent variable should involve hierarchical linear modeling (HLM), but was beyond the scope of this analysis.

Therefore, I conducted MANOVA on the higher education aspirations and expectations dependent variables, using three of the independent variables together, each having two levels, as

specified in the research questions: gender (male versus female), nativity (US-born versus Mexico-born), and grade level (9th-10th grade versus 11th-12th grade). I conducted a separate MANOVA on these dependent variables for the school ethnic composition independent variable. This allowed for a test of the effects of the non-nested independent variables, as well as an initial, although not strictly valid, assessment of the effects of the school composition variable on the dependent variables.

I assessed the independent and dependent variables as to whether they met the assumptions for MANOVA. The data met the assumptions of independence, linearity, and homoscedasticity. However, the dependent variables were not strictly normal, in that they did not exceed acceptable values of skewness and kurtosis, but they evidenced a ceiling effect, wherein many students responded with the highest option for the higher education aspirations and expectations items, resulting in a moderate left-skew to the data (as seen in Figure 4). Transformations and centering did little to correct this effect, so, in the spirit of working with the data at hand, I proceeded with the MANOVA, despite this violation to the assumption of normality.

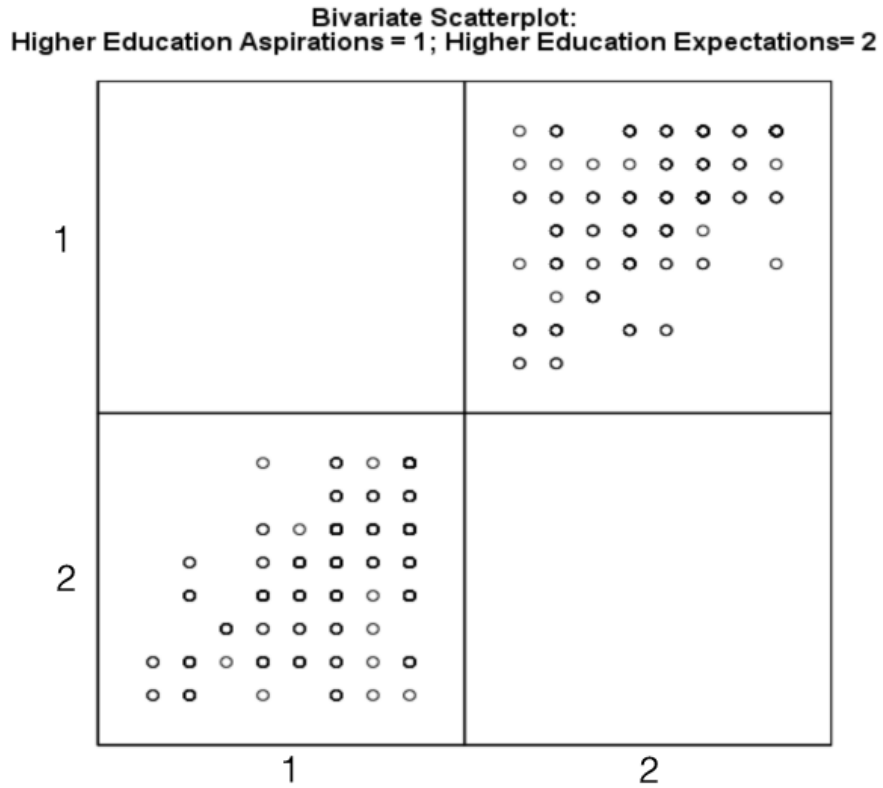


Figure 4. Bivariate scatterplot of higher education aspirations and expectations.

A bivariate correlational analysis revealed a moderately strong, positive correlation between the two dependent variables. However, there were no significant correlations between independent and dependent variables (see Table 11). Despite this lack of correlational significance between independent and dependent variables, I chose to move forth with the means difference analyses, in the interest of assessing presence of the group differences referenced in research question 2.

Table 11. Correlations for Dependent Variables (Higher Education Aspirations and Expectations) and Independent Variables

Measure	1	2	3	4	5
1 Education Aspirations	—				
2 Education Expectations	.60**	—			
3 Gender	-.08	-.07	—		
4 Nativity	-.03	-.01	.17**	—	
5 Grade Level	-.04	.03	-.02	.05	—

Note. Correlations reported involve listwise case deletion: Gender: Girls,  $n = 160$ ; Boys,  $n = 145$ ; Nativity: US-born,  $n = 193$ ; Mexico-born  $n = 112$ ; Grade Level: 9th-10th,  $n = 178$ ; 11th-12th,  $n = 127$ .

\* $p < .05$ , \*\* $p < .01$ .

Results from the three-way MANOVA revealed that the equality of covariance matrices assumption for multivariate analysis was not rejected. Interpretation of the multivariate tests evidenced no main effects for gender ( $Wilks' \Lambda = .994$ ,  $F_{(2, 296)} = .896$ ,  $p > .05$ ,  $\eta^2 = .006$ ), generational status ( $Wilks' \Lambda = .999$ ,  $F_{(2, 296)} = .100$ ,  $p > .05$ ,  $\eta^2 = .001$ ), nor grade level ( $Wilks' \Lambda = .995$ ,  $F_{(2, 296)} = .810$ ,  $p > .05$ ,  $\eta^2 = .005$ ). However, an interaction effect for a linear combination of the two outcomes was significant ( $Wilks' \Lambda = .979$ ,  $F_{(2, 296)} = 3.171$ ,  $p < .05$ ,  $\eta^2 = .021$ ). It should be noted, however, that the multivariate effect is very small. Analysis of variance (ANOVA) was conducted on each dependent variable as a follow up to MANOVA, and showed that the significant interaction effect pertained to higher education expectations ( $F_{(2, 297)} = 4.275$ ,  $p < .040$ ,  $\eta^2 = .014$ ). Specifically, female students born in the US ( $\mu = 5.46$ ) had greater higher

education expectations than female students born in Mexico ( $\mu = 4.90$ ), whereas US-born male students ( $\mu = 4.74$ ) showed lower higher education expectations than their Mexico-born male peers ( $\mu = 5.19$ ) (see Figure 5).

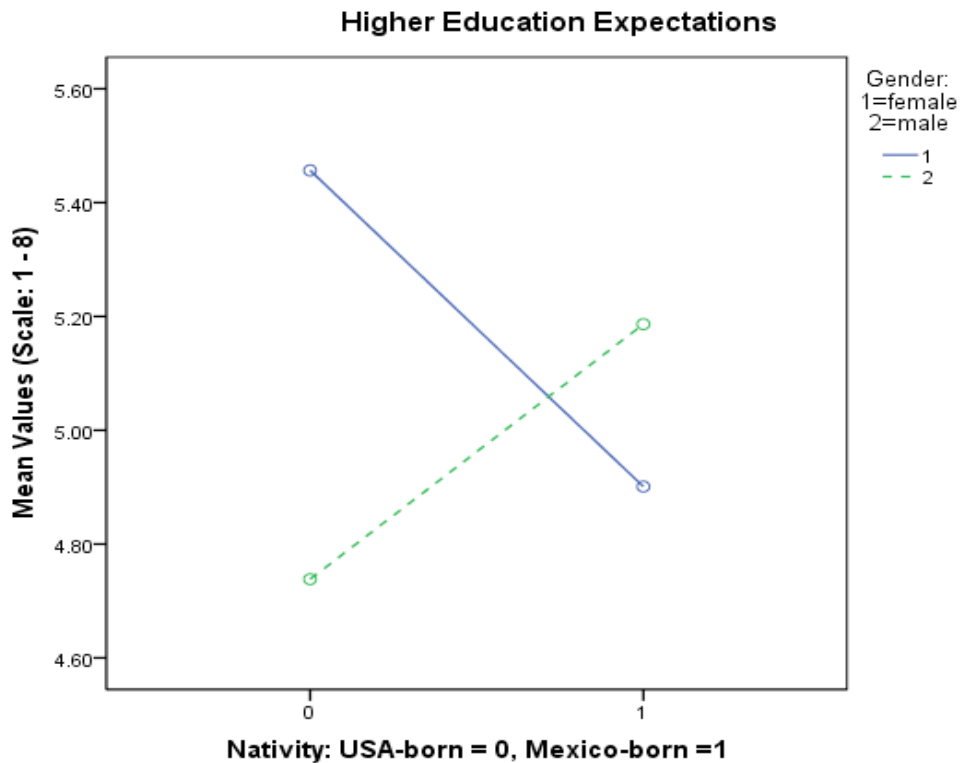


Figure 5. Interaction effect of gender and nativity on higher education expectations.

**MANOVA: School composition (2).** For the school composition MANOVA, Wilks' Lambda ( $\Lambda$ ) showed a main effect on the two outcome variables (*Wilks'  $\Lambda = .991$ ,  $F_{(2,345)} = 3.321$ ,  $p > .05$ ,  $\eta^2 = .019$* ). The multivariate effect, however, is very small. Posthoc analyses showed that the significant main effect pertained to higher education aspirations. Assessment of Levene's test did not reject the assumption of equality of error variances. Students in Latino majority schools ( $\mu = 6.27$ ) had significantly greater higher education aspirations than students in Latino minority schools ( $\mu = 5.75$ ) ( $F_{(1,346)} = 4.797$ ,  $p = .03$ ,  $\eta^2 = .014$ ) (see Figure 6).

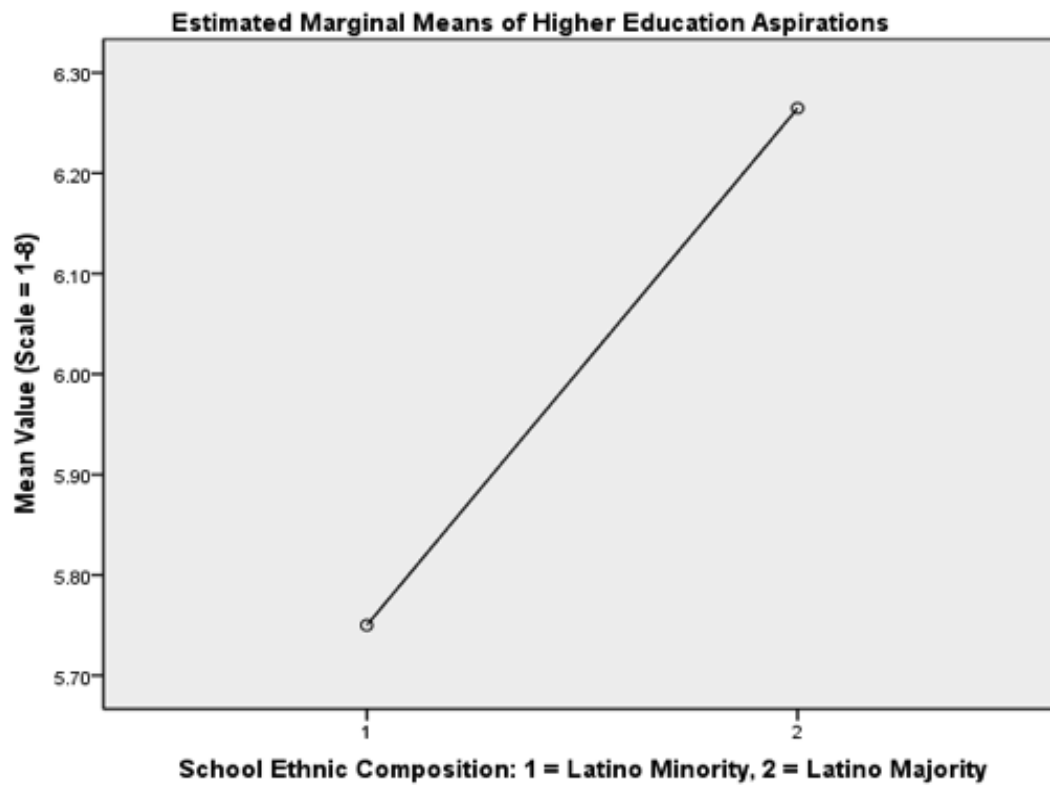


Figure 6. Main effect of school ethnic composition on higher education aspirations.

**CHAPTER V:****DISCUSSION, IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH****Discussion****Invariance Testing**

The inferential statistics and path modeling that were at the center of the present study required testing of the survey instrument for invariance across groups for which theoretical differences were hypothesized. The findings supported the anticipated latent factor structure, and the hypothesized equivalence of factor structures across groups. The random split-half procedure-based EFA revealed latent motivational orientation factors that evidenced anticipated content validity and good scale reliabilities. The latent factors aligned similarly to those found in prior studies when these items were administered to high school students (Nicholls, 1989; Nicholls, et al., 1985). For example, in their analyses of high school students' responses, Nicholls and colleagues (Nicholls, et al., 1985) also found that Task Orientation divided into separate Learning and Work Hard dimensions, and that Work Avoidance and Alienation formed separate dimensions, although the Cronbach's alpha value for the Work Avoidance dimension was sufficiently low to suggest that those items comprising this dimension may need to be reconsidered.

The English versus Spanish language multiple-group CFA showed the model to be language-invariant only after imposing the partial-invariance procedure (Byrne, 2006). This procedure involved removing two item-factor constraints from the constraints model, one for Task/Learning Orientation, and one for Work Hard Orientation. This requirement may be attributable, though, to the difference in sample size between English and Spanish language response subgroups. Nonetheless, the combined findings from the split-half EFA/CFA

procedures, moderate to high Cronbach's *alpha* values on resulting scales, Work Avoidance dimension notwithstanding, partial measurement invariance across languages, and the congeneric invariance tests across each pair of theoretical sub-groupings of students, establish these particular scales of Motivational Orientations Scales of Nicholls and colleagues' Theories of Schooling Questionnaire (Nicholls, et al., 1985) as valid and fair for use with Latino-identifying high school students.

The further factor analysis results confirm the anticipated pattern of second-order latent factors. Interestingly, the Ego Orientation dimension did not pertain exclusively to the Academic Approach or the Academic Avoidance latent factor, but rather cross-loaded between the two. The items composing this scale, however, were originally created to represent Ego Approach constructs. The Ego Avoidance items originally in the questionnaire did not substantially contribute to the total variance in the EFA, and were removed from the Motivational Orientations dimensions used for subsequent analyses. This finding may lend support to the suggestion from advocates of the *multiple goal perspective*, that Ego Orientation, even if composed of approach-related item content, can relate either to a more general approach or an academic avoidance orientation (Harackiewicz, et al, 2002; Midgley, et al., 2001).

### **Correlational Analysis**

Correlational analyses generally supported the hypothesized patterns between motivational orientations dimensions and higher education aspirations and expectations. In their foundational study, Nicholls et al. (1985) found stronger correlations between ego and task orientations for students from high schools with greater ethnic and socioeconomic status (SES) heterogeneity than for students from a more homogeneous, higher SES high school. Similarly, the present results showed the anticipated positive relationships between Task, Work Hard, and

Ego Orientations, and also revealed negative relationships between Task and Work Hard Orientations and Work Avoidance Orientation and Academic Alienation. Furthermore, Ego Orientation correlated positively not only with approach-related orientations, but also with avoidance-related orientations. Although correlation values were generally low for these relationships, the patterns of values differed across sub-groups of students. That is, those subgroups of students who evidenced significant positive relationships between higher education aspirations and expectations and the approach orientations of Task, Work Hard, and Ego Approach, also were largely those who evidenced correlations between Ego Orientation and the avoidance-related orientations of Work Avoidance and Alienation. These patterns of results may be pointing to sub-groups of students whose experiences involve varying degrees of sense of marginalization in their schooling experiences. Specifically, students demonstrating these patterns were female, immigrants from Mexico, and those who attend a school with a Latino minority population, the very students generally theorized to be of a more marginalized status in rural schools that have large Latino student populations (Gándara, et al., 2004; Suárez-Orozco & Suárez-Orozco, 1995, 2001; Valdés, 1996; Valenzuela, 1999).

Although finding these kinds of patterns among achievement goals is novel for research involving Latino student populations (i.e., there has not been much research investigating these constructs among Latinos students), finding differing patterns of relationships among achievement goals for differing student ethnic groups is not without precedent. In their study, Suliman and McInerney (2006) found differences in patterns of achievement goals, akin to motivational orientations, between Australian students of more socially-marginalized Lebanese-background status versus non-Lebanese-background students. Although they found no difference between groups on task/effort scale responses, Lebanese-background students evidenced

significantly more social concern for others, and were more competitive and power-oriented in the school setting than their non-Lebanese peers. What's more, these orientations, which share characteristics with Ego or Performance Orientations, negatively predicted achievement for Lebanese students. In light of the present findings, these similar patterns of relationships may be suggest similar implications for students of Mexican descent who are more marginalized in their schooling experiences, relative to their peers.

### **Path Model Analyses**

Results of the path analyses demonstrated both the hypothesized positive relationships for approach-related, and the negative relationships for avoidance-related motivational orientations and higher education orientation, across subgroups of students. However, the path models also offer a more nuanced story. The initial structural models, as represented in Figure 1, were largely equivalent for each grouping of students. Nonetheless, although the multiple groups CFA showed these particular scales for Nicholls' MOS to be invariant between English and Spanish versions of the survey, as well as across groups in the three-latent factor invariance tests, there were differences in the patterns of relationships, specifically for the path models between subgroups of gender, grade-level, and school composition. These differences appeared principally on Path 9, the relationship between Academic Approach (F2) and Academic Avoidance (F3) latent factors.

In theory, student groups evidencing a strongly negative value on Path 9 are making a stronger differentiation between motivational orientations that are adaptive and those that are mal-adaptive. In the present findings, students who were male, in 11th or 12th grade, and in Latino Majority schools showed the anticipated significant, negative relationship on Path 9, whereas students who were female, in 9th or 10th grade, or in Latino minority schools did not

show a significant relationship on this path. Similarly, Path 9 was negative but just reached significance for Mexican origin students.

In addition, Path 10, between Academic Approach (F2) and higher education orientation (F1), was positive for 9th-10th grade level and Latino majority school students, but was non-significant for the 11th and 12th grade level and the Latino minority school subsamples.

Although some of these low path coefficients and non-significant parameters may be attributable to disparate sample sizes (the immigrant student and Latino minority school sample sizes are relatively small compared to the US-born and Latino majority school samples), a broad assessment of these patterns reveals that patterns representing lower approach motivational orientation, and lower higher education orientation, occur principally among more marginalized student groups. Similarly, Gándara and colleagues (2004) found that, among Latino students in rural schools, more marginalized students had lower academic aspirations, and had more concerns about how others in the school perceived them as academically-oriented students.

The relationships on Path 4 in the model, between Ego Orientation and the Academic Avoidance latent variable (F3), revealed interesting patterns. When constraints were placed on the latent structural model (Models 1, 2, and 3), this path increased in value for the same student groups for whom Path 9 had changed. That is, for students who were female, in 9th-10th grades, and in Latino-minority schools, the variance accounted for by the relationship between Ego and Academic Avoidance went up when the model constraints forced Path 9 to decrease. Conversely, for the complementary subsamples of students, when constraints were added, the loading on Path 4 decreased. To clarify, it is possible that, for these more marginalized subgroups, when equality constraints are imposed on the path model, the variance of responses indicative of Ego Orientation increases to equalize the change in variance on Path 9.

The present findings speak to the theoretical difference between the ways that ego/performance approach goals are linked to adaptive outcomes (Elliot, 1999; Harackiewicz, et al., 1997), on the one hand, and the ways that ego avoidance goals are linked to maladaptive outcomes (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Although Harackiewicz and colleagues (2002) state that they agree with Midgley and colleagues (2001) that performance approach goals can have some negative consequences for students, such as avoidance of help and low academic persistence, they suggest that more research is needed to clarify such empirical links. Among students of Mexican descent, at least for those students participating in the present study, those students who may have been more marginalized in their schooling experiences also seem to exhibit an Ego Orientation that is more strongly related to Academic Avoidance than those who are theoretically not as marginalized. In the present study, items that are typically associated with ego approach goals (e.g., Item 12: I do the work better than other students; Item 14: I show people I'm good at something; Item 15: I show people I'm smart) composed a dimension that was found to relate structurally to both approach and avoidance dimensions (e.g., the latent factor comprising Work Avoidance and Academic Alienation), albeit more strongly to approach than to avoidance orientations. Based on these findings, it may be, as Midgley and colleagues suggest (2001), that performance or ego approach goals are adaptive for learners only under certain circumstances.

What we may be seeing, revealed in the present findings, as well as in the patterns demonstrated by McInerney and colleagues (Dowson & McInerney, 1998; Suliman & McInerney, 2006), and are the psychosocial effects, on particular groups of students, of the unequal realities of schooling in the US. That is, as students experience the stresses associated with acculturation to US schooling (Gonzalez & Padilla, 1997), as well as the realization that

academic opportunities do not fall upon all students equally and regularly (Phinney, Baumann, & Blanton, 2001; Suárez-Orozco & Suárez-Orozco, 1995), these understandings may manifest themselves in particular beliefs about, and motivational orientations, in particular Ego Orientations, toward schooling (Nicholls, 1989).

## MANOVA

The present analyses partly supported the hypothesized differences between groups of students on the higher education aspirations and expectations measures. Although main effects were not found for gender or nativity, and the anticipated grade level effect was not demonstrated, the interaction effect found between gender and nativity is intriguing. My expectation that female students would have lower expectations compared to male students was not fully supported: US-born girls and Mexico-born boys share a greater expectation for attaining higher education, whereas US-born boys and Mexico-born girls have lower expectations.

These results relate interestingly to the limited number of studies that have assessed Latino students' academic motivations. Although Alfaro and Umaña-Taylor's (2010) study differed from the present study, in that their measure of school motivation most closely relates to the Work Hard Orientation in the present study, and their main findings pertained to the contribution of motivational support offered through Latino students' sibling relationships, their study also found that the path between nativity and academic motivation was negative for female students. That is, female students who had immigrated to the US, nearly all of whom were of Mexican origin, evidenced higher academic motivation than US-born female students. This finding relates to the current findings, as, again, MANOVA results with the present student

sample showed neither a main effect for gender nor nativity, but instead revealed an interaction between these student characteristics.

In their study, Hurtado and Gauvain (1997) found that their Latino high school participants who attended college after high school were those who were more acculturated to US types of schooling and academic customs, and were those who referenced primary sources of college information when in high school (parents/guardians, coaches, teachers, siblings, peers, and employers). That is, students who sought information about college options from people with whom they were more likely to have a positive, caring relationship and to trust, as opposed to secondary sources such as brochures, college fairs, college visits, and career centers (Hurtado & Gauvain, 1997), were more likely to end up attending college. The present study did not address these types of information seeking, specifically. However, despite the large difference in sample sizes, which suggests that results be interpreted with caution, the present finding of greater higher education aspirations among students attending Latino majority schools, compared to those where Latinos are in the minority, may speak to the notion of trust and college information seeking in Latino students' high school experiences. One can imagine that these types of primary source encounters and levels of trust may be more likely for students in school settings where Latinos students' interests and futures are not just one aspect of a school's agenda, but are the majority, demographically-centered issues of concern.

### **Contribution to the Research Literature and Practical Implications**

The purpose of this exploratory study was twofold: to assess the utility of the Motivational Orientations Scales items with a student population that is culturally-distinct from those with which the items have been previously assessed, and to investigate whether patterns of relationships between motivational orientations and higher education orientations differ among

groups of students' of Mexican origin who vary in terms of gender, grade level, generational status, and school ethnic composition.

This study supports the use of Nicholls' (1989) Motivational Orientations Scales with particular student populations, specifically adolescent students of Mexican descent. Much of the research on the college-going of Latino students has focused on urban learners. This study specifically investigated students of Mexican descent attending rural schools, and the present findings offer a more nuanced set of understandings of the higher education orientations of students of Mexican descent. Higher education attainment is not equally expected among students of differing gender or generational status: rather expectations for higher education vary depending on the combined factors of students' gender and nativity. What's more, sample size differences, and the lack of hierarchical linear modeling notwithstanding, the present results show a trend for students of Mexican descent in schools with student who are mostly like themselves to have greater higher education aspirations. It may be that this ethnic majority versus minority finding relates to a difference in school ethos that, if oriented toward caring and nurturing of students of Mexican descent, as other researchers have suggested (Gándara, et al., 2004; Valenzuela, 1999), may support those students' beliefs about their future academic opportunities.

The research literature related to Approach and Avoidance goals (Harackiewicz, et al., 2002; Midgley, et al., 2001) has suggested that Ego Approach goals may help students compete positively in school. However, the present findings provide evidence that Ego/Performance Approach goals may be linked to Avoidance Orientations, and that these patterns may differ according to student characteristics, some of which may be linked to level of student marginalization. The experience of Ego Orientation, while potentially beneficial for students

who are already strongly task oriented, may lead toward less adaptive academic orientations for those students who may be struggling in their schooling experiences. It may be particularly beneficial for educational stakeholders to assess the constellations of students' characteristics, such as those addressed in this study, and their motivational orientations, with particular focus on Ego Orientations, in the interest of increasing and maintaining high academic motivations and aspirations for higher education for all students.

### **Limitations and Future Research**

Although the findings of the present study offer insights into the influences of gender, nativity, grade level, and school ethnic composition on the motivations and beliefs about future educational opportunities for students of Mexican descent, the study is limited in a number of ways. The low Cronbach's alpha on the Work Avoidance Orientation dimension suggests that the items composing this dimension may need review. Small sample sizes for some of the student subgroups may have limited the size of the effects found in the path models and multivariate analyses. Also, the higher education aspirations and expectations items, used here as dependent variables, evidenced a ceiling effect, thus introducing a skewness to the data, which may have contributed to the failure to find the hypothesized main effects on these dependent variables by student subgroup membership. Lastly, the hierarchical nature of the data, that students are nested within particular schools, calls into question the validity of the analyses involving school ethnic composition. Analyses employing hierarchical linear modeling (HLM) would be more appropriate, to account for potentially high intraclass correlations in the data. However, although the student sample is sufficiently large, the present data has only two cases at the school level, and HLM analyses would be better-suited for data with more school-level variables (Snijders & Bosker, 1999).

There may be implications to be gleaned from further analyses with this data set. One avenue would be to pursue logistic modeling of the higher education aspiration and expectation items, to better address group-based differences in terms of level of higher education aspirations and expectations. Rasch modeling of the motivational orientations items (e.g., Muis, Winne, & Edwards, 2009) or of the higher education orientations-related items would offer insights into the relative likelihood of students' adopting beliefs about attaining differing levels of education.

Still another direction in which analyses of this data could be taken would be to perform latent variable structural equation modeling that is inclusive of not only motivational orientations, but that also includes latent factors from the *Strategies for School Success* and the *Theories of the Purposes of Schooling* sections of Nicholls' Theories about Schooling questionnaire (Nicholls, 1989), both of which were collected in the larger study. Findings from such analyses would offer a constructive comparison to the patterns of relationships between achievement goals and strategies found for ethnic minority students by McInerney and colleagues (Dowson & McInerney, 1998; Suliman & McInerney, 2006).

### Notes

<sup>1</sup> Although the term Hispanic is often used in the literature, the term Latino is preferred in this study, as is *of Mexican descent*, if the national origin of participants' family members is known.

<sup>2</sup> Generational status, as used in this paper, refers to a person's status as an immigrant to the United States. The term *first generation* or *immigrant* describes a person whose parents and the person himself/herself were born abroad and who have immigrated to a new country. *Second generation* describes a person whose parents were born in another country, but the person was born in the current country of residence. *Third generation(-plus/-and beyond)* status describes someone whose grandparents were born in another country, and both parents and the person herself/himself were born in the country of current residence. *Mixed-generation*, or *1.5 generation* status describes 1) a person for whom one parent was born in another country, the other parent was born in the current country of residence, and the person herself/himself was born either in or outside of the current country of residence, or 2) a person who immigrates later in childhood or adolescence, and thus straddles their home culture and the culture to which they immigrated (see Suárez-Orozco & Suárez-Orozco, 1995).

<sup>3</sup> Various terms are used for self-identification of ethnicity among persons of Mexican decent, including *Chicano*, *Mexican-American*, *Mexican* or *of Mexican descent*. Personal identification often changes due to acculturation or longer U.S. residency (Suárez-Orozco & Suárez-Orozco, 2001; Matute-Bianchi, 1986). On the demographic form used in this study, these terms have been added to terms used for ethnic self-identification by governmental and educational organizations (U.S. Census Bureau, 2004; WA State OSPI, 2005).

### References

- Abbott, R. D., & Berninger, V. W. (1993). Structural equation modeling of relationships among developmental skills and writing skills in primary and intermediate grade writers. *Journal of Educational Psychology, 85*, 478–508.
- Alfaro, E.C., & Umaña-Taylor (2010). Latino adolescents' academic motivation: The role of siblings. *Hispanic Journal of Behavioral Sciences, 32*(4), 549-570.
- Ames. C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261-271.
- Anzaldúa, G. E. (1987). *Borderlands/La Frontera: The New Mestiza*. San Francisco: Aunt Lute Books.
- Bentler, P. M. (2006). *EQS 6 Structural Equations Program Manual*. Encino, CA: Multivariate Software.
- Bohon, S. A., Kirkpatrick Johnson, M., Gorman, B., K. (2006). College aspirations and expectations among Latino adolescents in the United States. *Social Problems, 53*(2), 207-225.
- Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for partial measurement invariance. *Psychological Bulletin, (105)*, 456-466.
- Byrne, B.M. (2006). *Structural equation modeling with EQS: Basic concepts, applications, and programming (2<sup>nd</sup> Ed.)*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Contreras, F. E. (2005). Access, achievement, and social capital: Standardized exams and the Latino college-bound population. *Journal of Hispanic Higher Education, 4*(3), 197-214.
- Darling-Hammond, L. (2004). Standards, Accountability, and School Reform. *Teachers College Record, 106*(6), p. 1047-1085.

- Dowson, M., & McInerney, D.M. (2004). The development and validation of the goal orientation and learning strategies survey (GOALS-S). *Educational and Psychological Measurement, 64*(2), 290-310.
- Dowson, M., & McInerney, D.M. (1998). Age, gender, cultural, and socioeconomic differences in students' academic motivation, cognition, and achievement. *Paper presented at the annual meeting of the American Educational Research Association, San Diego, California.*
- Duda, J.L., & Nicholls, J.G. (1992). Dimensions of achievement motivation in school work and sport. *Journal of Educational Psychology, 84*, 290-299.
- Elliot, A.J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169-189.
- Elliot, A.J., & Church, M.A. (1997). A hierarchical model of approach and avoidance achievement motivation: A mediational analysis. *Journal of Personality and Social Psychology, 72*, 218-232.
- Elliot, A., & Harackiewicz, J. M. (1994). Goal setting, achievement orientation, and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 66*(5), 968-980.
- Elliot, A., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70*, 461-475.
- Elliot, A., & Dweck, C. S. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*, 5-12.

Gamboa, E. (2000). *Mexican Labor & World War II: Braceros in the Pacific Northwest, 1942-1947*. Seattle, WA: University of WA Press.

Gándara, P., O'Hara, S., & Gutiérrez, D. (2004). The changing shape of aspirations: Peer influence on achievement behavior. In Gibson, M. A., Gándara, P., & Koyama, J. P. (Eds.) *School Connections: U.S. Mexican Youth, Peers, and School Achievement*. New York, NY: Teachers College Press.

Garson, G.D. (2009). *Structural Equation Modeling*. Retrieved from <http://faculty.chass.ncsu.edu/garson/PA765/structur.htm>

Gibson, M. A., Bejinez, L. F., Hidalgo, N., & Rolón, C. (2004). Belonging and school participation: Lessons from a migrant student club. In Gibson, M. A., Gándara, P., & Koyama, J. P. (Eds.) *School Connections: U.S. Mexican Youth, Peers, and School Achievement*. New York, NY: Teachers College Press.

Gibson, M. A., Gándara, P., & Koyama, J. P. (2004). The role of peers in the schooling of U.S. Mexican Youth. In Gibson, M. A., Gándara, P., & Koyama, J. P. (Eds.) *School Connections: U.S. Mexican Youth, Peers, and School Achievement*. New York, NY: Teachers College Press.

Gonzalez, R., & Padilla, A. M. (1997). The academic resilience of Mexican American high school students. *Hispanic Journal of Behavioral Sciences*, 19(3), 301-317.

Gutiérrez, K. (2006). *Culture Matters: Rethinking Educational Equity*. New York: Carnegie Foundation.

Gutierrez, K.D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), pp. 19–25.

- Gutiérrez, R. (2008). A “gap-gazing” fetish in Mathematics education? Problematizing Research on the Achievement Gap. *Journal for Research in Mathematics Education*, 39(4), 357-364.
- Guzman, G. (2006). Latino history of Washington State. *HistoryLink.org*. Retrieved from [http://www.historylink.org/index.cfm?DisplayPage=output.cfm&File\\_Id=7901](http://www.historylink.org/index.cfm?DisplayPage=output.cfm&File_Id=7901)
- Hamilton, E. H. (2010). Motivational orientations and theories of the purposes of schooling: Complicating the school identities of students of Mexican descent. *Paper presented at the Annual Meeting of the American Educational Research Association*, Denver, CO.
- Harackiewicz, J.M., Barron, K.E., Pintrich, P.R., Elliot, A.J., & Thrash, T.M. (2002). Revision of Achievement Goal Theory: Necessary and illuminating. *Journal of Educational Psychology*, 94(3), 638-645.
- Harackiewicz, J. M., Barron, K. E., Carter, S. M., Lehto, A. T., & Elliot, A. J. (1997). Predictors and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology*, 73(6), 1284-1295.
- Hardré, P.L., Crowson, H.M., Debacker, T.K., & White, D. (2007). Predicting the academic motivation of rural high school students. *Journal of Experimental Education*, 75(4), 247-269.
- Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21<sup>st</sup> century. *Review of Educational Research*, 70(2), 151-179.
- Holland, D., Lachicotte, W., Skinner, D., & Cain, C. (1998). *Identity and Agency in Cultural Worlds*. Cambridge, MA: Harvard University Press.

Hurd, C. A. (2004). "Acting out" and being a "Schoolboy": Performance in an ELD Classroom.

In Gibson, M. A., Gándara, P., & Koyama, J. P. (Eds.) *School Connections: U.S. Mexican Youth, Peers, and School Achievement*. New York, NY: Teachers College Press.

Hurtado, M.T., & Gauvain, M. (1997). Acculturation and planning for college among youth of Mexican descent. *Hispanic Journal of Behavioral Sciences*, 19(4), 506-516.

Jagacinski, C.M., & Duda, J.L. (2001). A comparative analysis of contemporary achievement goal orientation measures. *Educational and Psychological Measurement*, 61(6), 1013-1039.

Kao, G., & Tienda, M. (1998). Educational aspirations of minority youth. *American Journal of Education*, 106(3), 349-384.

Kandel, W., & Kao, G. (2001). The Impact of temporary labor migration on Mexican children's educational aspirations and performance. *International Migration Review*, 35(4), 1205-1231.

King, R.B., & Watkins, D.A. (2011). The reliability and validity of the Goal Orientation and Learning Strategies Survey (GOALS-S): A Filipino investigation. *The Asia Pacific Education Researcher* 20(3), 579-594.

Kohl, H. (1994). *"I Won't Learn from You": And Other Thoughts on Creative Maladjustment*. New York, NY: W.W. Norton & Co.

Matute-Bianchi, M.E. (1986). Ethnic identities and patterns of school success and failure among Mexican descent and Japanese-American students in a California high school: An ethnographic analysis. *American Journal of Education*, 95(1), 233-255.

McInerney, D.M., Hinkley, J., Dowson, M., & Van Etten, S. (1998). Aboriginal, Anglo, and

Immigrant Australian students' motivational beliefs about personal academic success: Are there cultural differences? *Journal of Educational Psychology*, *90*(4), 621-629.

McInerney, D.M., Roche, L.A., McInerney, V., & Marsh, H.W. (1997). Cultural perspectives on school motivation: the relevance and application of goal theory. *American Educational Research Journal*, *34*(1), 207-236.

Meece, J.L., and K. Holt. (1993). "A pattern analysis of students' achievement goals," *Journal of Educational Psychology* *26*, 399-427.

Mertler, C.A., & Vannatta, R.A. (2005). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation* (3<sup>rd</sup> Ed.) Glendale, CA: Pyrczak.

Midgley, C., A. Kaplan, and M. Middleton. (2001). "Performance/approach goals: Good for what, for whom, under what circumstances, and at what cost?," *Journal of Educational Psychology* *93* (1), 77-86.

Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., Anderman E. M., & Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology* *23*, 113-131.

Muis, K.R., & Edwards, O.V. (2009). Examining the stability of achievement goal orientation. *Contemporary Educational Psychology*, *34*, 265-277.

Muis, K.R., Winne, P.H., & Edwards, O.V. (2009). Modern psychometrics for assessing achievement goal orientation: A Rasch analysis. *British Journal of Educational Psychology*, *79*, 547-576.

Nicholls, J. G. (1979). Quality and equality in intellectual development: The role of motivation in education. *American Psychologist*, *34*, 1071-1084.

- Nicholls, J. G. (1989). *The Competitive Ethos and Democratic Education*. Cambridge, MA: Harvard University Press.
- Nicholls, J. G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R. Sternberg & J. Kolligan, Jr. (Eds.), *Competence Considered* (pp. 11-40). New Haven, CT: Yale University Press.
- Nicholls, J. G., & Miller, A. T. (1984). Reasoning about the ability of self and others: A developmental study. *Child Development*, 55, 1990-1999.
- Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology*, 77(6), 683-692.
- Nolen, S. B. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognitive Instruction*, 5, 269-287.
- Nolen, S. B. (1996). Why study? How reasons for learning influence strategy selection. *Educational Psychology Review*, 8(4), 335-355.
- Nolen, S.B., & Haladyna, T. M. (1990). Motivation and studying in high school science. *Journal of Research in Science Teaching*, 27, 115-126.
- Nolen, S. B., Ward, C. J. , & Horn, I. S. (2012). Studying the development of motivation, identity and learning in multiple social contexts: A situative approach. *European Journal of Psychology of Education*. Online November 9, 2011.
- Perez, W., & Padilla, A.M. (2000). Cultural orientation across three generations of Hispanic adolescents. *Hispanic Journal of Behavioral Sciences*, 22(3), 390-398.
- Pett, M.A., Lackey, N.R., & Sullivan, J.J. (2003). *Making Sense of Factor Analysis: The Use of Factor Analysis for Instrument Development in Health Care Research*. Thousand Oaks, CA: Sage.

- Phinney, J.S., Baumann, K., & Blanton, S. (2001). Life goals and attributions for expected outcomes among adolescents from five ethnic groups. *Hispanic Journal of Behavioral Sciences, 23*(4), 363-377.
- Pintrich, P. R., & Garcia, T. (1991). Student goal orientation and self-regulation in the college classroom. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement. A Research Annual. Vol. 7*, (pp. 371-402) Greenwich, CT: JAI Press.
- Plunkett, S.W., & Bámaca-Gómez, M.Y. (2003). The relationship between parenting, acculturation, and adolescent academics in Mexican-origin immigrant families in Los Angeles. *Hispanic Journal of Behavioral Sciences, 25*(2), 222-239.
- Portes, A. (2000). The two meanings of social capital. *Sociological Forum, 15*, 1-12.
- Portes, A., & Zhou, M. (1993). The new second generation: Segmented assimilation and its variants. *Annals of the American Academy, 530*, 74-96.
- Rogoff, B. (2003). *The Cultural Nature of Human Development*. Oxford: Oxford University Press.
- Ruiz Soto (2009). "The future of the children of immigrants: A study of Latino higher education aspirations and abilities." September, 2009. Retrieved from <http://www.walatinos.org>
- Smith, R. (2002). Gender, ethnicity, and race in school and work outcomes of second-generation Mexican Americans. In Suárez-Orozco, M. M., & Páez, M. M. (Eds.) *Latinos: Remaking America*. Berkeley, CA: University of California Press.
- Snijders, T.A.B., & Bosker, R.J. (1999). *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. London: Sage Publications.
- Stanton-Salazar, R. D. (2001). *Manufacturing hope and despair: The school and kin support networks of U.S.-Mexican youth*. New York: Teachers College Press.

- Stanton-Salazar, R. D., (2004). Social capital among working class minority students. In Gibson, M. A., Gándara, P., & Koyama, J. P. (Eds.) *School Connections: U.S. Mexican Youth, Peers, and School Achievement*. New York, NY: Teachers College Press.
- Suárez-Orozco, M. M. (2000). Everything you ever wanted to know about assimilation but were afraid to ask. *Daedalus*, 129(4), 1-30.
- Suárez-Orozco, M. M., & Páez, M. M. (2002). *Latinos: Remaking America*. Berkeley, CA: University of California Press.
- Suárez-Orozco, C., & Suárez-Orozco, M. M. (1995). *Trans-formations: Immigration, family life, and achievement motivation among Latino adolescents*. Cambridge, MA: Harvard University Press.
- Suárez-Orozco, C., & Suárez-Orozco, M. M. (2001). *Children of Immigration*. California: Stanford University Press.
- Suárez-Orozco, C., & Suárez-Orozco, M. M., Todorova, I. (2008). *Learning a New Land: Immigrant Students in American Society*. Cambridge, MA: Harvard University Press.
- Suliman, R., & McInerney, D.M. (2006). Motivational goals and school achievement: Lebanese-background students in south-western Sydney. *Australian Journal of Education*, 50(3), 242-264.
- Tabachnick, B.G., & Fidell, L.S. (1996). *Using Multivariate Statistics* (3<sup>rd</sup> ed.). New York, NY: Harper Collins.
- U.S. Census Bureau. (2004, March). *Educational Attainment in the United States: 2004*. Retrieved December 28, 2005, from U.S. Census Bureau Online: <http://www.census.gov/population/www/socdemo/education/cps2004.html>

- Valdés, G. (1996). *Con respeto: Bridging the distances between culturally diverse families and schools: An ethnographic portrait*. New York, NY: Teachers College Press.
- Valencia, R. (2002). The plight of Chicano students: An overview of schooling conditions and outcomes. In Valencia, R. (Ed.) *Chicano School Failure and Success: Research and Policy Agendas for the 1990s*. New York, NY: Routledge Falmer Press.
- Valenzuela, A. (1999). *Subtractive schooling: U.S.-Mexican youth and the politics of caring*. New York: SUNY.
- Washington State Office of the Superintendent of Public Instruction. (2005, September). *Graduation and dropout statistics for Washington's counties, districts, and schools, school year 2003-2004*. Available: <http://www.k12.wa.us/DataAdmin/pubdocs/GradDropout/03-04/Graduationanddropoutstatistics2003-04Final.pdf>
- Waxman, H.C., Huang, S.L., Padron, Y.N. (1997). Motivation and learning environment differences between resilient and nonresilient Latino middle school students. *Hispanic Journal of Behavioral Sciences, 19*(2), 137-147.
- Wentzel, K. R. (1991). "Social and academic goals at school: Motivation and achievement in context," in M.L. Maehr and P.R. Pintrich (eds.), *Advances in Motivation and Achievement. A Research Annual 7*, Greenwich, CT: JAI Press, 185-212.
- Wentzel, K. R. (1993). "Social and academic goals at school: Motivation and achievement in early adolescence," *Journal of Early Adolescence 13*, 4-20.
- Willis, P.E. (1981). *Learning to labor: How working class kids get working class jobs*. Irvington, NY: Columbia University Press.
- Zarate, M.E., Bhimji, F., & Reese, L. (2005). Ethnic identity and academic achievement among Latino/a adolescents. *Journal of Latinos and Education, 4*(2), 95-114.

## Appendix

### Items of the Motivational Orientation Scales

Scale endpoints for all items: Strong Agree...Strongly Disagree. Endpoints reversed for analyses. An asterisk indicates that item was retained for further analysis during split-half EFA procedure.

Prompt: I feel most successful if...

- |  |   |
|--|---|
| 1 something I learn really makes sense to me.                | 17 I don't do anything stupid in class.   |
| 2 I get a new idea about how things work.*                   | 18 people don't think I'm dumb.   |
| 3 I learn something interesting.*                            | 19 I score high on a test without studying.   |
| 4 a class makes me think about things.                       | 20 I do well without trying.  |
| 5 I solve a tricky problem by working hard.                  | 21 I don't have to do any homework.   |
| 6 I finally understand a really complicated idea.*           | 22 I don't have to work hard.   |
| 7 something I learn makes me want to find out more.          | 23 the teacher doesn't ask any hard questions.*   |
| 8 I keep busy.*  | 24 all the work is easy.*   |
| 9 I work hard all day.*                                      | 25 I don't have any tough tests.*   |
| 10 I spend my time at school doing school-related work.*     | 26 I get out of some work.  |
| 11 I don't waste my time at school goofing around.*          | 27 I do almost no work and get away with it.*   |
| 12 I do the work better than other students.*                | 28 I put one over on (I trick) the teacher.*  |
| 13 I get one of the highest scores on a test or quiz.        | 29 I fool around and get away with it.*   |
| 14 I show people I'm good at something.*                     | 30 I avoid doing poorly in class.   |
| 15 I show people I'm smart.*                                 | 31 I avoid performing poorly.   |
| 16 I am the only one who can answer the teacher's questions. | 32 I avoid asking questions that make me look like I don't know what I'm talking about. |
|  | 33 I avoid making responses that make me look like I don't know what I'm talking about. |